11. INTAKE OF MEATS, DAIRY PRODUCTS, AND FATS

11.1. INTRODUCTION

The American food supply is generally considered to be one of the safest in the world. Nevertheless, meats, dairy products, and fats may become contaminated with toxic chemicals by several pathways. These foods sources can become contaminated if animals are exposed to contaminated media (i.e., soil, water, or feed crops). To assess exposure through this pathway, information on meat, dairy, and fat ingestion rates are needed.

A variety of terms may be used to define intake of meats, dairy products, and fats (e.g., consumer-only intake, per capita intake, total meat, dairy product, or fat intake, as-consumed intake, uncooked edible portion intake, dry-weight intake). As described in Chapter 9, Intake of Fruits and Vegetables, consumer-only intake is defined as the quantity of meats, dairy products, or fats consumed by individuals during the survey period averaged across only the individuals who consumed these food items during the survey period. Per capita intake rates are generated by averaging consumer-only intakes over the entire population In general, per capita intake rates are appropriate for use in exposure assessment for which average dose estimates are of interest because they represent both individuals who ate the foods during the survey period and individuals who may eat the food items at some time, but did not consume them during the survey period. Per capita intake, therefore, represents an average across the entire population of interest, but does so at the expense of underestimating consumption for the subset of the population that consumes the food in question. Total intake refers to the sum of all meats, dairy products, or fats consumed in a day.

Intake rates may be expressed on the basis of the as-consumed weight (e.g., cooked or prepared) or on the uncooked or unprepared weight. As-consumed intake rates are based on the weight of the food in the form that it is consumed and should be used in assessments where the basis for the contaminant concentrations in foods is also indexed to the as-consumed weight. Some of the food ingestion values provided in this chapter are expressed as as-consumed intake rates because this is the fashion in which data were reported by survey respondents. Others are provided as uncooked weights based on analyses of survey data that account for weight changes that occur during cooking. This is of importance because concentration data to be used in the dose equation are often measured in uncooked food samples. It should be recognized that cooking can either increase or decrease food weight. Similarly, cooking can increase the mass of contaminant in food (due to formation reactions, or absorption from cooking oils or water) or decrease the mass of contaminant in food (due to vaporization, fat loss, or leaching). The combined effects of changes in weight and changes in contaminant mass can result in either an increase or decrease in contaminant concentration in cooked food. Therefore, if the as-consumed ingestion rate and the uncooked concentration are used in the dose equation, dose may be under-estimated or over-estimated. It is important for the assessor to be aware of these issues and choose intake rate data that best match the concentration data that are being used. For more information on cooking losses and conversions necessary to account for such losses, refer to Chapter 13 of this handbook.

Sometimes contaminant concentrations in food are reported on a dry-weight basis. When these data are used in an exposure assessment, it is recommended that dry-weight intake rates also be used. Dry-weight food concentrations and intake rates are based on the weight of the food consumed after the moisture content has been removed. Similarly, when contaminant concentrations in food are reported on a lipid-weight basis, lipid-weight intake rates should be used. For information on converting the intake rates presented in this chapter to dry-weight or lipid-weight intake rates, refer to Sections 11.5 and 11.6 of this chapter.

The purpose of this chapter is to provide intake data for meats, dairy products, and fats. The recommendations for ingestion rates of meats, dairy products, and fats are provided in the next section, along with a summary of the confidence ratings for these recommendations. The recommended values are based on the key study identified by U.S. Environmental Protection Agency (EPA) for this factor. Following the recommendations, the key study on ingestion of meats, dairy products, and fats are summarized. Relevant data on ingestion of meats, dairy products, and fats are also provided. These studies are presented to provide the reader with added perspective on the current state-of-knowledge pertaining to ingestion of meats, dairy products, and fats.

11.2. RECOMMENDATIONS

Table 11-1 presents a summary of the recommended values for per capita and consumer-only intake of meats, dairy products, and fats. Table 11-2 provides confidence ratings for these recommendations.

U.S. EPA analyses of data from the 2003−2006 National Health and Nutrition Examination Survey (NHANES) were used in selecting recommended intake rates for intake of meats and dairy products by the general population. The U.S. EPA analysis of meat and dairy products was conducted using childhood age groups that differed slightly from U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). However, for the purposes of the recommendations for children presented here, data were placed in the standardized age categories closest to those used in the analysis. The U.S. EPA analysis of fat intake data from the U.S. Department of Agriculture's (USDA's) Continuing Survey of Food Intake by Individuals [CSFII, U.S. EPA (2007)] were used in selecting recommended intake rates for fats. This study used the childhood age groups recommended by U.S. EPA (2005).

The NHANES data on which the recommendations for meats and dairy products are based, and the CSFII data on which the recommendations for fats are based are short-term survey data and may not necessarily reflect the long-term distribution of average daily intake rates. However, since these broad categories of food (i.e., total meats and dairy products), are eaten on a daily basis throughout the year with minimal seasonality, the short term distribution may be a reasonable approximation of the long-term distribution, although it will display somewhat increased variability. This implies that the upper percentiles shown here will tend to overestimate the corresponding percentiles of the true long-term distribution. In general, the recommended values based on U.S. EPA's analyses of NHANES data and CSFII data represent the uncooked weight of the edible portion of meat, dairy, and fats. It should be noted that because the recommendations for fat intake are based on 1994−1996 and 1998 CSFII data, they may not reflect the most recent changes that may have occurred in consumption patterns.

Table 11-1. Recommended Values for Intake of Meats, Dairy Products, and Fats, Edible Portion, Uncooked

Age Group (years)	Per Capita		Consumers Only		Multiple Percentiles	Source
	Mean	95th Percentile	Mean	95th Percentile		
	g/kg-day	g/kg-day	g/kg-day	g/kg-day		
Total Meat[a]						
Birth to 1	1.2	5.4[b]	2.7	8.1[b]	See Table 11-3 and Table 11-4	U.S. EPA Analysis of NHANES 2003−2006
1 to <2	4.0	10.0[b]	4.1	10.1[b]		
2 to <3	4.0	10.0[b]	4.1	10.1[b]		
3 to <6	3.9	8.5	3.9	8.6		
6 to <11	2.8	6.4	2.8	6.4		
11 to <16	2.0	4.7	2.0	4.7		
16 to <21	2.0	4.7	2.0	4.7		
21 to <50	1.8	4.1	1.8	4.1		
≥50	1.4	3.1	1.4	3.1		
Total Dairy Products[a]						
Birth to 1	10.1	43.2[b]	11.7	44.7[b]	See Table 11-3 and Table 11-4	U.S. EPA Analysis of NHANES 2003−2006
1 to <2	43.2	94.7[b]	43.2	94.7[b]		
2 to <3	43.2	94.7[b]	43.2	94.7[b]		
3 to <6	24.0	51.1	24.0	51.1		
6 to <11	12.9	31.8	12.9	31.8		
11 to <16	5.5	16.4	5.5	16.4		
16 to <21	5.5	16.4	5.5	16.4		
21 to <50	3.5	10.3	3.5	10.3		
≥50	3.3	9.6	3.3	9.6		
Individual Meat and Dairy Products—See Table 11-5 and Table 11-6						

Table 11-1. Recommended Values for Intake of Meats, Dairy Products, and Fats, Edible Portion, Uncooked (continued)

Age Group	Per Capita		Consumers Only		Multiple Percentiles	Source
	Mean	95th Percentile	Mean	95th Percentile		
	g/kg-day	g/kg-day	g/kg-day	g/kg-day		
Total Fat						
Birth to <1 month	5.2	16	7.8	16	See Table 11-31 and Table 11-33	U.S. EPA (2007)
1 to <3 months	4.5	12	6.0	12		
3 to <6 months	4.1	8.2	4.4	8.3		
6 to <12 months	3.7	7.0	3.7	7.0		
1 to <2 years	4.0	7.1	4.0	7.1		
2 to <3 years	3.6	6.4	3.6	6.4		
3 to <6 years	3.4	5.8	3.4	5.8		
6 to <11 years	2.6	4.2	2.6	4.2		
11 to <16 years	1.6	3.0	1.6	3.0		
16 to <21 years	1.3	2.7	1.3	2.7		
21 to <31 years	1.2	2.3	1.2	2.3		
31 to <41 years	1.1	2.1	1.1	2.1		
41 to <51 years	1.0	1.9	1.0	1.9		
51 to <61 years	0.9	1.7	0.9	1.7		
61 to <71 years	0.9	1.7	0.9	1.7		
71 to <81 years	0.8	1.5	0.8	1.5		
≥81 years	0.9	1.5	0.9	1.5		

[a] Analysis was conducted using slightly different childhood age groups than those recommended in *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). Data were placed in the standardized age categories closest to those used in the analysis.

[b] Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Table 11-2. Confidence in Recommendations for Intake of Meats, Dairy Products, and Fats

General Assessment Factors	Rationale	Rating
Soundness		High
Adequacy of Approach	The survey methodology and data analysis were adequate. The surveys sampled approximately 16,000 for meats and dairy products and 20,000 individuals for fats. Analyses of primary data were conducted.	
Minimal (or Defined) Bias	No physical measurements were taken. The method relied on recent recall of meats and dairy products eaten.	
Applicability and Utility		High for meats and dairy products; medium for fats
Exposure Factor of Interest	The key studies were directly relevant to meat, dairy, and fat intake.	
Representativeness	The data were demographically representative of the U.S. population (based on stratified random sample).	
Currency	Data were collected between 2003 and 2006 for meat and dairy products and between 1994 and 1998 for fats.	
Data Collection Period	Data were collected for two non-consecutive days.	
Clarity and Completeness		High
Accessibility	The NHANES and CSFII data are publicly available.	
Reproducibility	The methodology used was clearly described; enough information was included to reproduce the results.	
Quality Assurance	NHANES and CSFII follow strict QA/QC procedures. U.S. EPA analysis of NHANES data has only been reviewed internally.	
Variability and Uncertainty		Medium to high for averages, low for long-term upper percentiles; low for individual foods
Variability in Population	Full distributions were provided for total meats, total dairy products, and total fats. Means were provided for individual meats and dairy products.	
Uncertainty	Data collection was based on recall of consumption for a 2-day period; the accuracy of using these data to estimate long-term intake (especially at the upper percentiles) is uncertain. However, use of short-term data to estimate chronic ingestion can be assumed for broad categories of foods such as total meats, total dairy products, and total fats. Uncertainty is likely to be greater for individual meats and dairy products.	
Evaluation and Review		Medium
Peer Review	Both the NCHS NHANES and the USDA CSFII survey received high levels of peer review. The U.S. EPA analysis of the NHANES data has not been peer reviewed outside the Agency, but methodology has been used in analysis of previous data.	
Number and Agreement of Studies	There was one key study for intake of meat and dairy products (2003−2006 NHANES) and 1 key study for fat intake [U.S. EPA (2007), based on 1994−1996, 1998 CSFII].	
Overall Rating		**Medium to high** confidence in the averages; **Low** confidence in the long-term upper percentiles

11.3. INTAKE OF MEAT AND DAIRY PRODUCTS

11.3.1. Key Meat and Dairy Intake Studies

11.3.1.1. *U.S. EPA Analysis of Consumption Data From 2003−2006 National Health and Nutrition Examination Survey (NHANES)*

The key source of recent information on consumption rates of meat and dairy products is the U.S. Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics' (NCHS) NHANES. Data from NHANES have been used by the U.S. EPA, Office of Pesticide Programs (OPP) to generate per capita and consumer-only intake rates for both individual meat and dairy products and total meat and dairy products.

NHANES is designed to assess the health and nutritional status of adults and children in the United States. In 1999, the survey became a continuous program that interviews a nationally representative sample of approximately 7,000 persons each year and examines a nationally representative sample of about 5,000 persons each year, located in counties across the country, 15 of which are visited each year. Data are released on a 2 year basis, thus, for example, the 2003 data are combined with the 2004 data to produce NHANES 2003−2004.

The dietary interview component of NHANES is called *What We Eat in America* and is conducted by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (DHHS). DHHS' NCHS is responsible for the sample design and data collection and USDA's Food Surveys Research Group is responsible for the dietary data collection methodology, maintenance of the databases used to code and process the data, and data review and processing. Beginning in 2003, 2 non-consecutive days of 24-hour intake data were collected. The first day is collected in-person, and the second day is collected by telephone 3 to 10 days later. These data are collected using USDA's dietary data collection instrument, the Automated Multiple Pass Method. This method provides an efficient and accurate means of collecting intakes for large-scale national surveys. It is fully computerized and uses a 5-step interview. Details can be found at USDA's Agriculture Research Service (http://www.ars.usda.gov/ba/bhnrc/fsrg).

For NHANES 2003−2004, there were 12,761 persons selected; of these, 9,643 were considered respondents to the mobile examination center (MEC) examination and data collection. However, only 9,034 of the MEC respondents provided complete dietary intakes for Day 1. Furthermore, of those providing the Day 1 data, only 8,354 provided complete dietary intakes for Day 2. For NHANES 2005−2006, there were 12,862 persons selected; of these 9,950 were considered respondents to the MEC examination and data collection. However, only 9,349 of the MEC respondents provided complete dietary intakes for Day 1. Furthermore, of those providing the Day 1 data, only 8,429 provided complete dietary intakes for Day 2.

The 2003−2006 NHANES surveys are stratified, multistage probability samples of the civilian non-institutionalized U.S. population. The sampling frame was organized using 2000 U.S. population census estimates. NHANES oversamples low income persons, adolescents 12 to 19 years, persons 60 years and older, African Americans, and Mexican Americans. Several sets of sampling weights are available for use with the intake data. By using appropriate weights, data for all 4 years of the surveys can be combined. Additional information on NHANES can be obtained at http://www.cdc.gov/nchs/nhanes.htm.

In 2010, OPP used NHANES 2003−2006 data to update the Food Commodity Intake Database (FCID) that was developed in earlier analyses of data from the U.S. Department of Agriculture's (USDA's) CSFII (U.S. EPA, 2000; USDA, 2000) (see Section 11.3.2.3), NHANES data on the foods people reported eating were converted to the quantities of agricultural commodities eaten. "Agricultural commodity" is a term used by U.S. EPA to mean plant (or animal) parts consumed by humans as food; when such items are raw or unprocessed, they are referred to as "raw agricultural commodities." For example, beef stew may contain the commodities beef, potatoes, carrots, and other vegetables. FCID contains approximately 558 unique commodity names and 8-digit codes. The FCID commodity names and codes were selected and defined by U.S. EPA and were based on the U.S. EPA Food Commodity Vocabulary (http://www.epa.gov/pesticides/foodfeed/).

Intake rates were generated for a variety of food items/groups based on the agricultural commodities included in the FCID. These intake rates represent intake of all forms of the product (e.g., both home produced and commercially produced) for individuals who provided data for 2 days of the survey. Note that if the person reported consuming food for only one day, their 2-day average would be half the amount reported for the one day of consumption. Individuals who did not provide information on body weight or for whom identifying information was unavailable were excluded from the analysis. Two-day average intake rates were calculated for all individuals in the

database for each of the food items/groups. These average daily intake rates were divided by each individual's reported body weight to generate intake rates in units of grams per kilogram of body weight per day (g/kg-day). The data were weighted according to the 4-year, 2-day sample weights provided in NHANES 2003−2006 to adjust the data for the sample population to reflect the national population. Summary statistics were generated on a consumer-only and on a per capita basis. Summary statistics, including number of observations, percentage of the population consuming the meats and dairy products being analyzed, mean intake rate, and standard error of the mean intake rate were calculated for total meats, total dairy products, and selected individual meats and dairy products. Percentiles of the intake rate distribution (i.e., 1^{st}, 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, 95^{th}, 99^{th}, and the maximum value) were also provided for total meats and dairy products. Data were provided for the following age groups: birth to 1 year, 1 to 2 years, 3 to 5 years, 6 to 12 years, 13 to 19 years, 20 to 49 years, and ≥50 years. Data on females 13 to 49 years were also provided. Because these data were developed for use in U.S. EPA's pesticide registration program, the childhood age groups used are slightly different than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).

Table 11-3 presents per capita intake data for total meats and dairy products in g/kg-day; Table 11-4 provides consumer-only intake data for total meats and total dairy products in g/kg-day. Table 11-5 provides per capita intake data for individual meats and dairy products, and Table 11-6 provides consumer-only intake data for individual meats and dairy products. In general, these data represent intake of the edible portions of uncooked foods.

The results are presented in units of g/kg-day. Thus, the use of these data in calculating potential dose does not require the body-weight factor to be included in the denominator of the average daily dose (ADD) equation. It should be noted that converting these intake rates into units of g/day by multiplying by a single average body weight is inappropriate because individual intake rates were indexed to the reported body weights of the survey respondents. Also, it should be noted that the distribution of average daily intake rates generated using short-term data (e.g., 2-day) do not necessarily reflect the long-term distribution of average daily intake rates. The distributions generated from short-term and long-term data will differ to the extent that each individual's intake varies from day to day; the distributions will be similar to the extent that individuals' intakes are constant from day to day. However, for broad categories of foods (e.g., total meats and total dairy) that are eaten on a daily basis throughout the year, the short-term distribution may be a reasonable approximation of the true long-term distribution, although it will show somewhat more variability. In this chapter, distributions are provided only for broad categories of meats and dairy (i.e., total meats and total dairy). Because of the increased variability of the short-term distribution, the short-term upper percentiles shown here may overestimate the corresponding percentiles of the long-term distribution. For individual foods, only the mean, standard error, and percent consuming are provided.

An advantage of using the U.S. EPA's analysis of NHANES data is that it provides distributions of intake rates for various age groups of children and adults, normalized by body weight. The data set was designed to be representative of the U.S. population and includes 4 years of intake data combined. Another advantage is the currency of the data; the NHANES data are from 2003−2006. However, short-term dietary data may not accurately reflect long-term eating patterns and may under-represent infrequent consumers of a given food. This is particularly true for the tails (extremes) of the distribution of food intake. Because these are 2-day averages, consumption estimates at the upper end of the intake distribution may be underestimated if these consumption values are used to assess acute (i.e., short-term) exposures. Also, the analysis was conducted using slightly different childhood age groups than those recommended in U.S. EPA's Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants (U.S. EPA, 2005). However, given the similarities in the age groups used, the data should provide suitable intake estimates for the age groups of interest.

11.3.2. Relevant Meat and Dairy Intake Studies

11.3.2.1. *USDA (1996a, b, 1993, 1980)—Food and Nutrient Intakes of Individuals in 1 Day in the United States*

USDA calculated mean per capita intake rates for meat and dairy products using Nationwide Food Consumption Survey (NFCS) data from 1977−1978 and 1987−1988 (USDA, 1993, 1980) and CSFII data from 1994 and 1995 (USDA, 1996a, b). The mean per capita intake rates for meat are presented in Table 11-7 through Table 11-9 based on intake data for 1 day from the 1977−1978 (see Table 11-7) and

1987−1988 NFCSs (see Table 11-8), and 1994 and 1995 CSFII (see Table 11-9). Table 11-10 through Table 11-12 present similar data for dairy products. Note that the age classifications used in the later surveys were slightly different than those used in the 1977−1978 NFCS.

The advantages of using these data are that they provide mean intake estimates for all meat, poultry, and dairy products. The consumption estimates are based on short-term (i.e., 1-day) dietary data, which may not reflect long-term consumption. These data are based on older surveys and may not be entirely representative of current eating patterns.

11.3.2.2. *USDA (1999a)—Food and Nutrient Intakes by Children 1994−1996, 1998, Table Set 17*

USDA (1999a) calculated national probability estimates of food and nutrient intake by children based on 4 years of the CSFII (1994−1996 and 1998) for children age 9 years and under and on CSFII 1994−1996 only for individuals age 10 years and over. The CSFII was a series of surveys designed to measure the kinds and amounts of foods eaten by Americans. Intake data, based on 24-hour dietary recall, were collected through in-person interviews on 2 non-consecutive days. Section 11.3.2.3 provides additional information on these surveys.

USDA (1999a) used sample weights to adjust for non-response, to match the sample to the U.S. population in terms of demographic characteristics, and to equalize intakes over the 4 quarters of the year and the 7 days of the week. A total of 503 breast-fed children were excluded from the estimates, but both consumers and non-consumers were included in the analysis.

USDA (1999a) provided data on the mean per capita quantities (grams) of various food products/groups consumed per individual for 1 day, and the percent of individuals consuming those foods in 1 day of the survey. Table 11-13 and Table 11-14 present data on the mean quantities (grams) of meat and eggs consumed per individual for 1 day, and the percentage of survey individuals consuming meats and eggs on that survey day. Table 11-15 and Table 11-16 present similar data for dairy products. Data on mean intakes or mean percentages are based on respondents' Day-1 intakes.

The advantage of the USDA (1999a) study is that it uses the 1994−1996, 1998 CSFII data set, which includes 4 years of intake data, combined, and includes the supplemental data on children. These data are expected to be generally representative of the U.S. population, and they include data on a wide variety of meats and dairy products. The data set is one of a series of USDA data sets that are publicly available. One limitation of this data set is that it is based on 1 day, and short-term dietary data may not accurately reflect long-term eating patterns. Other limitations of this study are that it only provides mean values of food intake rates, consumption is not normalized by body weight, and presentation of results is not consistent with U.S. EPA's recommended age groups. These data are based on older surveys and may not be entirely representative of current eating patterns.

11.3.2.3. *U.S. EPA Analysis of CSFII 1994−1996, 1998 Based on USDA (2000) and U.S. EPA (2000)*

U.S. EPA/OPP, in cooperation with USDA's Agricultural Research Service, used data from the 1994−1996, 1998 CSFII to develop the FCID (U.S. EPA, 2000; USDA, 2000), as described in Section 11.3.1.1. The CSFII 1994−1996 was conducted between January 1994 and January 1997 with a target population of non-institutionalized individuals in all 50 states and Washington, DC. In each of the 3 survey years, data were collected for a nationally representative sample of individuals of all ages. The CSFII 1998 was conducted between December 1997 and December 1998 and surveyed children 9 years of age and younger. It used the same sample design as the CSFII 1994−1996 and was intended to be merged with CSFII 1994−1996 to increase the sample size for children. The merged surveys are designated as CSFII 1994−1996, 1998 (USDA, 2000). Additional information on the CSFII can be obtained at http://www.ars.usda.gov/Services/docs.htm?docid=14531.

The CSFII 1994−1996, 1998 collected dietary intake data through in-person interviews on 2 non-consecutive days. The data were based on 24-hour recall. A total of 21,662 individuals provided data for the first day; of those individuals, 20,607 provided data for a second day. The 2-day response rate for the 1994−1996 CSFII was approximately 76%. The 2-day response rate for CSFII 1998 was 82%. The CSFII 1994−1996, 1998 surveys were based on a complex multistage area probability sample design. The sampling frame was organized using 1990 U.S. population census estimates, and the stratification plan took into account geographic location, degree of urbanization, and socioeconomic characteristics. Several sets of sampling weights are available for use with the intake data. By using appropriate weights, data for all 4 years of the

surveys can be combined. USDA recommends that all 4 years be combined in order to provide an adequate sample size for children.

The meats and dairy items/groups selected for the U.S. EPA analysis included total meats and total dairy products, and individual meats and dairy such as beef, pork, poultry, and eggs. CSFII data on the foods people reported eating were converted to the quantities of agricultural commodities eaten. Intake rates for these food items/groups were calculated, and summary statistics were generated on both a per capita and a consumer-only basis using the same general methodology as in the U.S. EPA analysis of 2003−2006 NHANES data, as described in Section 11.3.1.1. Because these data were developed for use in U.S. EPA's pesticide registration program, the childhood age groups used are slightly different than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).

Table 11-17 presents per capita intake data for total meat and total dairy products in g/kg-day; Table 11-18 provides consumer-only intake data for total meat and total dairy products in g/kg-day. Table 11-19 provides per capita intake data for certain individual meats and dairy products, and Table 11-20 provides consumer-only intake data for these individual meats and dairy products. In general, these data represent intake of the edible portions of uncooked foods.

The results are presented in units of g/kg-day. Thus, use of these data in calculating potential dose does not require the body-weight factor to be included in the denominator of the average daily dose equation. The cautions concerning converting these intake rates into units of g/day by multiplying by a single average body weight and the discussion of the use of short term data in the NHANES description in Section 11.3.1.1 apply to the CSFII estimates as well.

A strength of U.S. EPA's analysis is that it provides distributions of intake rates for various age groups, normalized by body weight. The analysis uses the 1994−1996, 1998 CSFII data set, which was designed to be representative of the U.S. population. The data set includes 4 years of intake data combined and is based on a 2-day survey period. As discussed above, short-term dietary data may not accurately reflect long-term eating patterns and may under-represent infrequent consumers of a given food. This is particularly true for the tails (extremes) of the distribution of food intake. Although the analysis as conducted used slightly different age groups than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005), given the similarities in the age groups used, the data should provide suitable intake estimates for the childhood age groups of interest. While the CSFII data are older than the NHANES data, they provide relevant information on consumption by season, region of the United States, and urbanization, cohorts that are not available in the publicly released NHANES data.

11.3.2.4. *Smiciklas-Wright et al. (2002)—Foods Commonly Eaten in the United States: Quantities Consumed per Eating Occasion and in a Day, 1994−1996*

Using data gathered in the 1994−1996 USDA CSFII, Smiciklas-Wright et al. (2002) calculated distributions for the quantities of meat, poultry, and dairy products consumed per eating occasion by members of the U.S. population (i.e., serving sizes). The estimates of serving size are based on data obtained from 14,262 respondents, ages two years and above, who provided 2 days of dietary intake information. Only dietary intake data from users of the specified food were used in the analysis (i.e., consumer-only data).

Table 11-21 presents serving size data for meats and dairy products. These data are presented on an as-consumed basis (grams) and represent the quantity of meats and dairy products consumed per eating occasion. These estimates may be useful for assessing acute exposures to contaminants in specific foods, or other assessments where the amount consumed per eating occasion is necessary. Only the mean and standard deviation serving size data and percent of the population consuming the food during the 2-day survey period are presented in this handbook. Percentiles of serving sizes of the foods consumed by these age groups of the U.S. population can be found in Smiciklas-Wright et al. (2002).

The advantages of using these data are that they were derived from the USDA CSFII and are representative of the U.S. population. The analysis conducted by Smiciklas-Wright et al. (2002) accounted for individual foods consumed as ingredients of mixed foods. Mixed foods were disaggregated via recipe files so that the individual ingredients could be grouped together with similar foods that were reported separately. Thus, weights of foods consumed as ingredients were combined with weights of foods reported separately to provide a more thorough representation of consumption. However, it should be noted that since the recipes for the mixed foods consumed were not provided by the

respondents, standard recipes were used. As a result, the estimates of quantity consumed for some food types are based on assumptions about the types and quantities of ingredients consumed as part of mixed foods. This study used data from the 1994−1996 CSFII; data from the 1998 children's supplement were not included.

11.3.2.5. *Vitolins et al. (2002)—Quality of Diets Consumed by Older Rural Adults*

Vitolins et al. (2002) conducted a survey to evaluate the dietary intake, by food groups, of older (>70 years) rural adults. The sample consisted of 130 community dwelling residents from two rural counties in North Carolina. Data on dietary intake over the preceding year were obtained in face-to-face interviews conducted in participants' homes, or in a few cases, a senior center. The food frequency questionnaire used in the survey was a modified version of the National Cancer Institute Health Habits and History Questionnaire; this modified version included an expanded food list containing a greater number of ethnic foods than the original food frequency form. Demographic and personal data collected included sex, ethnicity, age, education, denture use, marital status, chronic disease, and weight.

Food items reported in the survey were grouped into food groups similar to the USDA Food Guide Pyramid and the National Cancer Institute's 5 A Day for Better Health program. These groups are: (1) fruits and vegetables; (2) bread, cereal, rice, and pasta; (3) milk, yogurt, and cheese; (4) meat, fish, poultry, beans, and eggs; and (5) fats, oils, sweets, and snacks. Medians, ranges, frequencies, and percentages were used to summarize intake of each food group, broken down by demographic and health characteristics. In addition, multiple regression models were used to determine which demographic and health factors were jointly predictive of intake of each of the five food groups.

Thirty-four percent of the survey participants were African American, 36% were European American, and 30% were Native American. Sixty-two percent were female, 62% were not married at the time of the interview, and 65% had some high school education or were high school graduates. Almost all of the participants (95%) had one or more chronic diseases. Sixty percent of the respondents were between 70 and 79 years of age; the median age was 78 years old. Table 11-22 presents the median servings of milk, yogurt, and cheese broken down by demographic and health characteristics. None of the demographic characteristics were significantly associated with milk intake, and only ethnicity was found to be borderline (p = 0.13). In addition, none of the demographic characteristics were jointly predictive of milk, yogurt, and cheese consumption.

One limitation of the study, as noted by the study authors, is that the study did not collect information on the length of time the participants had been practicing the dietary behaviors reported in the survey. The questionnaire asked participants to report the frequency of food consumption during the past year. The study authors noted that, currently, there are no dietary assessment tools that allow the collection of comprehensive dietary data over years of food consumption. Another limitation of the study is the small sample size used, which makes associations by sex and ethnicity difficult.

11.3.2.6. *Fox et al. (2004)—Feeding Infants and Toddlers Study: What Foods Are Infants and Toddlers Eating*

Fox et al. (2004) used data from the Feeding Infants and Toddlers study (FITS) to assess food consumption patterns in infants and toddlers. The FITS was sponsored by Gerber Products Company and was conducted to obtain current information on food and nutrient intakes of children, ages 4 to 24 months old, in the 50 states and the District of Columbia. The FITS is described in detail in Devaney et al. (2004). FITS was based on a random sample of 3,022 infants and toddlers for which dietary intake data were collected by telephone from their parents or caregivers between March and July 2002. An initial recruitment and household interview was conducted, followed by an interview to obtain information on intake based on 24-hour recall. The interview also addressed growth, development, and feeding patterns. A second dietary recall interview was conducted for a subset of 703 randomly selected respondents. The study over-sampled children in the 4 to 6 and 9 to 11-months age groups; sample weights were adjusted for non-response, over-sampling, and under-coverage of some subgroups. The response rate for the FITS was 73% for the recruitment interview. Of the recruited households, there was a response rate of 94% for the dietary recall interviews (Devaney et al., 2004). Table 11-23 shows the characteristics of the FITS study population.

Fox et al. (2004) analyzed the first set of 24-hour recall data collected from all study participants. For this analysis, children were grouped into six age categories: 4 to 6 months, 7 to 8 months, 9 to 11 months, 12 to 14 months, 15 to 18 months, and 19 to 24 months. Table 11-24 provides the percentage of

infants and toddlers consuming milk, meats, or other protein sources at least once in a day. The percentage of children consuming any type of meat or protein source ranged from 14.2% for 4 to 6-month olds to 97.2% for 19 to 24-month olds (see Table 11-24).

The advantages of this study are that the study population represented the U.S. population and the sample size was large. One limitation of the analysis done by Fox et al. (2004) was that only frequency data were provided; no information on actual intake rates was included. In addition, Devaney et al. (2004) noted several limitations associated with the FITS data. For the FITS, a commercial list of infants and toddlers was used to obtain the sample used in the study. Since many of the households could not be located and did not have children in the target population, a lower response rate than would have occurred in a true national sample was obtained (Devaney et al., 2004). In addition, the sample was likely from a higher socioeconomic status when compared with all U.S. infants in this age group (4 to 24 months old), and the use of a telephone survey may have omitted lower-income households without telephones (Devaney et al., 2004).

11.3.2.7. *Ponza et al. (2004)—Nutrient Food Intakes and Food Choices of Infants and Toddlers Participating in WIC*

Ponza et al. (2004) conducted a study using selected data from FITS to assess feeding patterns, food choices, and nutrient intake of infants and toddlers participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Ponza et al. (2004) evaluated FITS data for the following age groups: 4 to 6 months (N = 862), 7 to 11 months (N = 1,159), and 12 to 24 months (N = 996). Table 11-25 shows the total sample size described by WIC participants and non-participants.

The foods consumed were analyzed by tabulating the percentage of infants who consumed specific foods/food groups per day (Ponza et al., 2004). Weighted data were used in all of the analyses used in the study (Ponza et al., 2004). Table 11-25 presents the demographic data for WIC participants and non-participants. Table 11-26 provides the food choices for infants and toddlers. In general, there was little difference in food choices among WIC participants and non-participants, except for consumption of yogurt by infants 7 to 11 months of age and toddlers 12 to 24 months of age (see Table 11-26). Non-participants, 7 to 24 months of age, were more likely to eat yogurt than WIC participants (Ponza et al., 2004).

An advantage of this study is that it had a relatively large sample size and was representative of the U.S. general population of infants and children. A limitation of the study is that intake values for foods were not provided. Other limitations are associated with the FITS data and are described previously in Section 11.3.2.6.

11.3.2.8. *Mennella et al. (2006)—Feeding Infants and Toddlers Study: The Types of Foods Fed to Hispanic Infants and Toddlers*

Mennella et al. (2006) investigated the types of food and beverages consumed by Hispanic infants and toddlers in comparison to the non-Hispanic infants and toddlers in the United States. The FITS 2002 data for children between 4 and 24 months old were used for the study. The data represent a random sample of 371 Hispanic and 2,367 non-Hispanic infants and toddlers (Mennella et al., 2006). Mennella et al. (2006) grouped the infants as follows: 4 to 5 months (N = 84 Hispanic; 538 non-Hispanic), 6 to 11 months (N = 163 Hispanic; 1,228 non-Hispanic), and 12 to 24 months (N = 124 Hispanic; 871 non-Hispanic) of age.

Table 11-27 provides the percentages of Hispanic and non-Hispanic infants and toddlers consuming milk, meats, or other protein sources on a given day. In most instances, the percentages consuming the different types of meats and protein sources were similar (Mennella et al., 2006).

The advantage of the study is that it provides information on food preferences for Hispanic and non-Hispanic infants and toddlers. A limitation is that the study did not provide food intake data, but provided frequency of use data instead. Other limitations are those noted previously in Section 11.3.2.6 for the FITS data.

11.3.2.9. *Fox et al. (2006)—Average Portion of Foods Commonly Eaten by Infants and Toddlers in the United States*

Fox et al. (2006) estimated average portion sizes consumed per eating occasion by children 4 to 24 months of age who participated in the FITS. The FITS is a cross-sectional study designed to collect and analyze data on feeding practices, food consumption, and usual nutrient intake of U.S. infants and toddlers and is described in Section 11.3.2.6 of this chapter. It included a stratified random sample of 3,022 children between 4 and 24 months of age.

Using the 24-hour recall data, Fox et al. (2006) derived average portion sizes for six major food groups, including meats and other protein sources.

Average portion sizes for select individual foods within these major groups were also estimated. For this analysis, children were grouped into six age categories: 4 to 5 months, 6 to 8 months, 9 to 11 months, 12 to 14 months, 15 to 18 months, and 19 to 24 months. Table 11-28 and Table 11-29 present the average portion sizes of meats and dairy products for infants and toddlers, respectively.

11.4. INTAKE OFFAT

11.4.1. Key Fat Intake Study

11.4.1.1. *U.S. EPA (2007)—Analysis of Fat Intake Based on the U.S. Department of Agriculture's 1994–1996, 1998 Continuing Survey of Food Intakes by Individuals (CSFII)*

U.S. EPA conducted an analysis to evaluate the dietary intake of fats by individuals in the United States using data from the USDA's 1994–1996, 1998 CSFII (USDA, 2000). Intakes of CSFII foods were converted to U.S. EPA food commodity codes using data provided in U.S. EPA's FCID (U.S. EPA, 2000). The FCID contains a "translation file" that was used to break down the USDA CSFII food codes into 548 U.S. EPA commodity codes. The method used to translate USDA food codes into U.S. EPA commodity codes is discussed in detail in U.S. EPA (2000).

Each of the 548 U.S. EPA commodity codes was assigned a value between zero and one that indicated the mass fraction of fat in that food item. For many sources of fat, a commodity code existed solely for the nutrient fat portion of the food. For example, beef is represented in the FCID database by 10 different commodity codes; several of these codes specifically exclude fat, and one code is described as "nutrient fat only." In these cases, the fat fraction could be expressed as 0 or 1, as appropriate. Most animal food products and food oils were broken down in this way. The fat contents of other foods in the U.S. EPA commodity code list were determined using the USDA Nutrient Database for Standard Reference, Release 13 (USDA, 1999b). For each food item in the U.S. EPA code list, the best available match in the USDA Nutrient Database was used. If multiple values were available for different varieties of the same food item (e.g., green, white, and red grapes), a mean value was calculated. If multiple values were available for different cooking methods (i.e., fried vs. dry cooked), the method least likely to introduce other substances, such as oil or butter, was preferred. In some cases, not all of the items that fall under a given food commodity code could be assigned a fat content. For example, the food commodity code list identified "turkey, meat byproducts" as including gizzard, heart, neck, and tail. Fat contents could be determined only for the gizzard and heart. Because the relative amounts of the different items in the food commodity code were unknown, the mean fat content of these two items was assumed to be the best approximation of the fat content for the food code as a whole.

The analysis was based on respondents who had provided body weights and who had completed both days of the 2-day survey process. These individuals were grouped according to various age categories. The mean, standard error, and a range of percentiles of fat intake were calculated for 12 food categories (i.e., all fats, animal fats, meat and meat products, beef, pork, poultry, organ meats, milk and dairy products, fish, oils, nuts/seeds/beans/legumes/tubers, and others) and 98 demographic cohorts. Fat intake was calculated as a 2-day average consumption across both survey days in units of grams per day and grams per kilogram of body weight per day for the whole survey population and for consumers only.

A secondary objective of the study was to evaluate fat consumption patterns of individuals who consume high levels of animal fats. The entire data analysis was repeated for a subset of individuals who were identified as high consumers of animal fats. The selection of the high-consumption group was done for each age category individually, rather than on the whole population, because fat intake on a per body-weight basis is heavily skewed towards young children, and an analysis across the entire American population was desired. For infants, the "less-than-1-year-old" group was used instead of the smaller infant groups (<1 month, 1 to <3 months, etc.). Within each of the age categories, individuals that ranked at or above the 90^{th} percentile of consumption of all animal fats on a per unit body-weight basis were identified. Because of the sample weighting factors, the high consumer group was not necessarily 10% of each age group. The selected individuals made up a survey population of 2,134 individuals. Fat intake of individuals in this group was calculated in g/day and g/kg-day for the whole population (i.e., per capita) and for consumers only.

The analysis presented in U.S. EPA (2007) was conducted before U.S. EPA published the guidance entitled *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). Therefore, the age groups used for children in U.S. EPA (2007) were not entirely consistent with the age groups recommended in the 2005 guidance. A re-analysis of the some of the data was conducted to conform with U.S. EPA's recommended age groups for children. The results of this re-analysis are

included in Table 11-30 through Table 11-35 for all individuals. Only intake rates of all fats are provided in these tables; refer to U.S. EPA (2007) for fat intake rates from individual food sources. Table 11-30 and Table 11-31 present intake rates of all fats for the whole population (i.e., per capita) in g/day and g/kg-day, respectively. Table 11-32 and Table 11-33 present intake rates of all fats for consumers only in g/day and g/kg-day, respectively. Fat intake rates of all fats for the top decile of animal fat consumers from the consumers only group are presented in Table 11-34 in g/day and in Table 11-35 in g/kg-day (per capita total fat intake rates for the top decile of animal fat consumers are not provided because they are the same as those for consumers only).

11.4.2. Relevant Fat Intake Studies

11.4.2.1. *Cresanta et al. (1988)/Nicklas et al. (1993)/Frank et al. (1986)—Bogalusa Heart Study*

Cresanta et al. (1988), Nicklas et al. (1993), and Frank et al. (1986) analyzed dietary fat intake data as part of the Bogalusa heart study. The Bogalusa study, an epidemiologic investigation of cardiovascular risk-factor variables and environmental determinants, collected dietary data on subjects residing in Bogalusa, LA, beginning in 1973. Among other research, the study collected fat intake data for children, adolescents, and young adults. Researchers examined various cohorts of subjects, including (1) six cohorts of 10-year olds, (2) two cohorts of 13-year olds, (3) one cohort of subjects from 6 months to 4 years of age, and (4) one cohort of subjects from 10 to 17 years of age (Nicklas, 1995). To collect the data, interviewers used the 24-hour dietary recall method. According to Nicklas (1995), "the diets of children in the Bogalusa study are similar to those reported in national studies of children." Thus, these data are useful in evaluating the variability of fat intake among the general population. Table 11-36 and Table 11-37 present data for 6-month-old to 17-year-old individuals collected during 1973 to 1982 (Frank et al., 1986). Data are presented for total fats, animal fats, vegetable fats, and fish fats in units of g/day (see Table 11-36) and g/kg-day (see Table 11-37).

11.5. CONVERSION BETWEEN WET- AND DRY-WEIGHT INTAKE RATES

The intake rates presented in this chapter are reported in units of wet weight (i.e., as-consumed or uncooked weight of meats and dairy products consumed per day or per eating occasion). However, data on the concentration of contaminants in meats and dairy products may be reported in units of either wet or dry weight (e.g., mg contaminant per gram dry-weight of meats and dairy products). It is essential that exposure assessors be aware of this difference so that they may ensure consistency between the units used for intake rates and those used for concentration data (i.e., if the contaminant concentration is measured in dry weight of meats and dairy products, then the dry-weight units should be used for their intake values).

If necessary, wet weight (e.g., as-consumed) intake rates may be converted to dry-weight intake rates using the moisture content percentages presented in Table 11-38 and the following equation:

$$IR_{dw} = IR_{ww}\left[\frac{100 - W}{100}\right] \qquad \text{(Eqn. 11-1)}$$

where:

IR_{dw} = dry-weight intake rate,
IR_{ww} = wet-weight intake rate, and
W = percent water content.

Alternatively, dry-weight residue levels in meat and dairy products may be converted to wet-weight residue levels for use with wet-weight (e.g., as-consumed) intake rates as follows:

$$C_{ww} = C_{dw}\left[\frac{100 - W}{100}\right] \qquad \text{(Eqn. 11-2)}$$

where:

C_{ww} = wet-weight concentration,
C_{dw} = dry-weight concentration, and
W = percent water content.

The moisture content data presented in Table 11-38 are for selected meats and dairy products taken from USDA (2007).

11.6. CONVERSION BETWEEN WET-WEIGHT AND LIPID-WEIGHT INTAKE RATES

In some cases, the residue levels of contaminants in meat and dairy products may be reported as the concentration of contaminant per gram of fat. This may be particularly true for lipophilic compounds.

When using these residue levels, the assessor should ensure consistency in the exposure assessment calculations by using consumption rates that are based on the amount of lipids consumed for the meat or dairy product of interest.

If necessary, wet-weight (e.g., as-consumed) intake rates may be converted to lipid-weight intake rates using the fat content percentages presented in Table 11-38 and the following equation:

$$IR_{lw} = IR_{ww}\left[\frac{L}{100}\right] \quad \text{(Eqn. 11-3)}$$

where:

IR_{lw} = lipid-weight intake rate,
IR_{ww} = wet-weight intake rate, and
L = percent lipid (fat) content.

Alternately, wet-weight residue levels in meat and dairy products may be estimated by multiplying the levels based on fat by the fraction of fat per product as follows:

$$C_{ww} = C_{lw}\left[\frac{L}{100}\right] \quad \text{(Eqn. 11-4)}$$

where:

C_{ww} = wet-weight concentration,
C_{lw} = lipid-weight concentration, and
L = percent lipid (fat) content.

The resulting residue levels may then be used in conjunction with wet-weight (e.g., as-consumed) consumption rates. Table 11-38 presents the total fat content data for selected meat and dairy products taken from USDA (2007).

11.7. REFERENCES FOR CHAPTER 11

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Table 11-3. Per Capita Intake of Total Meat and Total Dairy Products Based on 2003−2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	% Consuming	Mean	SE	Percentiles 1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Total Meat														
Whole Population	16,783	98	2.0	0.02	0.0	0.2	0.5	0.9	1.6	2.5	3.8	4.8	7.8	23.4*
Age Group														
Birth to 1 year	865	44	1.2	0.12	0.0*	0.0*	0.0	0.0	0.0	1.7	3.6	5.4*	9.3*	18.7*
1 to 2 years	1,052	98	4.0	0.12	0.0*	0.4*	0.8	2.0	3.4	5.5	8.0	10.0*	14.0*	23.4*
3 to 5 years	978	99	3.9	0.13	0.0*	0.7	1.4	2.1	3.3	5.0	7.6	8.5	12.4*	19.5*
6 o 12 years	2,256	99	2.8	0.06	0.1*	0.5	0.9	1.5	2.5	3.8	5.2	6.4	8.9*	13.6*
13 to 19 years	3,450	99	2.0	0.04	0.0	0.3	0.6	1.0	1.7	2.7	3.8	4.7	6.8	13.5*
20 to 49 years	4,289	99	1.8	0.03	0.0	0.3	0.5	1.0	1.6	2.4	3.4	4.1	5.7	12.0*
Females 13 to 49 years	4,103	99	1.6	0.04	0.0	0.2	0.4	0.8	1.3	2.1	3.0	3.6	5.1	12.2*
50 years and older	3,893	99	1.4	0.02	0.0	0.2	0.4	0.8	1.3	1.9	2.6	3.1	4.4	8.6*
Race														
Mexican American	4,450	98	2.2	0.05	0.0	0.2	0.5	1.0	1.8	3.0	4.2	5.4	8.3	18.9*
Non-Hispanic Black	4,265	99	2.2	0.05	0.0	0.3	0.6	1.0	1.7	2.9	4.5	5.8	9.0	23.4*
Non-Hispanic White	6,757	98	1.8	0.02	0.0	0.2	0.5	0.9	1.5	2.4	3.5	4.4	6.9	18.7*
Other Hispanic	562	97	2.2	0.08	0.0*	0.2	0.5	1.1	1.9	2.8	4.0	6.0	10.1*	19.5*
Other Race—Including Multiple	749	98	2.3	0.12	0.0*	0.1	0.5	1.0	1.9	2.9	4.5	6.4	9.6*	15.1*
Total Dairy Products														
Whole Population	16,783	99.7	6.6	0.16	0.0	0.2	0.5	1.3	3.2	7.1	15.4	25.0	56.8	185.3*
Age Group														
Birth to 1 year	865	86	10.1	0.76	0.0*	0.0*	0.0	1.2	6.4	11.5	19.6	43.2*	83.1*	163.9*
1 to 2 years	1,052	100	43.2	1.80	1.0*	5.7*	10.7	20.3	39.1	59.4	84.1	94.7*	141.22*	185.3*
3 to 5 years	978	100	24.0	0.76	0.9*	4.5	8.3	13.6	20.7	32.0	41.9	51.1	68.2*	154.5*
6 to 12 years	2,256	100	12.9	0.42	0.5*	1.5	2.6	5.6	10.8	17.8	26.0	31.8	42.9*	57.7*
13 to 19 years	3,450	100	5.5	0.25	0.1	0.4	0.6	1.6	4.0	7.6	12.3	16.4	24.9	45.0*
20 to 49 years	4,289	99.8	3.5	0.14	0.0	0.2	0.4	1.0	2.4	4.7	8.1	10.3	17.1	52.7*
Females 13 to 49 years	4,103	99.6	3.8	0.16	0.0	0.2	0.5	1.1	2.5	5.2	8.5	11.3	18.9	52.7*
50 years and older	3,893	100	3.3	0.09	0.0	0.2	0.4	1.0	2.3	4.5	7.3	9.6	15.2	28.8*
Race														
Mexican American	4,450	99.6	8.5	0.36	0.0	0.2	0.7	1.4	3.7	9.4	21.8	34.4	67.2	156.4*
Non-Hispanic Black	4,265	99.5	5.0	0.19	0.0	0.1	0.2	0.7	1.8	4.6	12.6	20.1	50.6	175.2*
Non-Hispanic White	6,757	99.8	6.6	0.19	0.1	0.3	0.6	1.4	3.3	7.1	14.8	24.5	54.1	185.3*
Other Hispanic	562	99	8.1	0.88	0.0*	0.1	0.4	1.2	3.1	7.0	20.5	39.2	69.2*	141.2*
Other Race—Including Multiple	749	99.6	6.7	0.50	0.0*	0.0	0.3	0.9	3.3	7.9	15.3	23.1	54.4*	112.2*

N = Sample size.
SE = Standard error.
Max = Maximum value.

* Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Source: U.S. EPA analysis of 2003−2006 NHANES data.

Table 11-4. Consumer-Only Intake of Total Meat and Total Dairy Products Based on 2003−2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	Percentiles									Max
				1st	5th	10th	25th	50th	75th	90th	95th	99th	
Total Meat													
Whole Population	16,147	2.0	0.02	0.0	0.3	0.5	1.0	1.6	2.6	3.8	4.8	7.8	23.4*
Age Group													
Birth to 1 year	385	2.7	0.20	0.0*	0.1*	0.2*	1.0	1.9	3.4	6.0*	8.1*	16.6*	18.7*
1 to 2 years	1,030	4.1	0.10	0.1*	0.5*	1.0	2.2	3.5	5.6	8.0	10.1*	14.0*	23.4*
3 to 5 years	968	3.9	0.13	0.0*	0.9	1.4	2.1	3.3	5.0	7.7	8.6	12.4*	19.5*
6 to 12 years	2,250	2.8	0.06	0.1*	0.5	0.9	1.5	2.5	3.8	5.2	6.4	8.9*	13.6*
13 to 19 years	3,422	2.0	0.04	0.0	0.4	0.6	1.1	1.7	2.7	3.8	4.7	6.9	13.5*
20 to 49 years	4,248	1.8	0.03	0.0	0.3	0.5	1.0	1.6	2.4	3.4	4.1	5.8	12.0*
Females 13 to 49 years	4,054	1.6	0.04	0.0	0.3	0.4	0.8	1.3	2.1	3.0	3.6	5.1	12.2*
50 years and older	3,844	1.4	0.02	0.0	0.3	05	0.8	1.3	1.9	2.6	3.1	4.4	8.6*
Race													
Mexican American	4,229	2.3	0.05	0.1	0.3	0.6	1.1	1.9	3.0	4.2	5.5	8.3	18.9*
Non-Hispanic Black	4,154	2.2	0.05	0.1	0.4	0.6	1.1	1.7	2.9	4.5	5.8	9.0	23.4*
Non-Hispanic White	6,520	1.9	0.02	0.0	0.3	0.5	0.9	1.6	2.4	3.5	4.5	7.0	18.7*
Other Hispanic	535	2.3	0.08	0.1*	0.4	0.7	1.2	1.9	2.8	4.1	6.0	10.1*	19.5*
Other Race—Including Multiple	709	2.3	0.12	0.0*	0.3	0.6	1.1	1.9	2.9	4.5	6.7	9.6*	15.1*
Total Dairy Products													
Whole Population	16,657	6.6	0.16	0.0	0.3	0.5	1.3	3.2	7.1	15.5	25.0	56.8	185.3*
Age Group													
Birth to 1 year	753	11.7	0.88	0.0*	0.1*	0.8*	3.1	7.8	12.3	22.1*	44.7*	86.4*	163.9*
1 to 2 years	1,052	43.2	1.79	1.0*	5.7*	10.6	20.3	39.1	59.4	84.0	94.7*	141.2*	185.3*
3 to 5 years	978	24.0	0.77	0.9*	4.7	8.3	13.7	20.7	32.0	41.9	51.1	68.2*	154.5*
6 to 12 years	2,256	12.9	0.42	0.5*	1.6	2.6	5.6	10.8	17.8	26.0	31.8	42.9*	57.7*
13 to 19 years	3,449	5.5	0.25	0.1	0.4	0.6	1.6	4.0	7.6	12.3	16.4	24.9	45.0*
20 to 49 years	4,280	3.5	0.14	0.0	0.2	0.4	1.0	2.4	4.7	8.1	10.3	17.1	52.7*
Females 13 to 49 years	4,095	3.8	0.16	0.0	0.2	0.5	1.1	2.5	5.3	8.5	11.3	18.9	52.7*
50 years and older	3,889	3.3	0.09	0.0	0.2	0.4	1.0	2.3	4.5	7.3	9.6	15.2	28.8*
Race													
Mexican American	4,406	8.6	0.36	0.0	0.3	0.5	1.4	3.8	9.5	21.8	34.4	67.1	156.4*
Non-Hispanic Black	4,246	5.0	0.19	0.0	0.1	0.2	0.7	1.8	4.7	12.7	20.3	50.6	175.2*
Non-Hispanic White	6,708	6.6	0.19	0.1	0.4	0.6	1.4	3.3	7.1	14.9	24.5	54.1	185.3*
Other Hispanic	553	8.1	0.87	0.0*	0.2	0.5	1.2	3.2	7.1	20.6	40.1	72.7*	141.2*
Other Race—Including Multiple	742	6.7	0.51	0.0*	0.0	0.3	0.9	3.3	7.9	15.3	23.1	54.4*	112.2*

N = Sample size;
SE = Standard error;
Max = Maximum value.
* Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).
Source: U.S. EPA analysis of 2003−2006 NHANES data.

Table 11-5. Per Capita Intake of Individual Meats and Dairy Products Based on 2003−2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	% Consuming	Mean	SE	% Consuming	Mean	SE	% Consuming	Mean	SE
		Beef			Pork			Poultry		
Whole Population	16,783	88	0.77	0.01	80	0.39	0.01	75	0.77	0.02
Age Group										
Birth to 1 year	865	27	0.34	0.07	19	0.17	0.04	37	0.69	0.09
1 to 2 years	1,052	84	1.38	0.08	73	0.75	0.06	81	1.87	0.07
3 to 5 years	978	91	1.42	0.08	79	0.79	0.06	82	1.65	0.07
6 to 12 years	2,256	92	1.11	0.04	84	0.52	0.02	77	1.18	0.06
13 to 19 years	3,450	91	0.83	0.03	79	0.36	0.02	74	0.80	0.02
20 to 49 years	4,289	88	0.73	0.02	81	0.36	0.02	77	0.71	0.02
Females 13 to 49 years	4,103	86	0.60	0.02	79	0.28	0.01	77	0.66	0.02
50 years and older	3,893	87	0.58	0.01	82	0.33	0.01	71	0.50	0.02
Race										
Mexican American	4,450	86	0.94	0.04	86	0.43	0.02	78	0.82	0.02
Non-Hispanic Black	4,265	88	0.79	0.03	79	0.40	0.03	84	1.01	0.03
Non-Hispanic White	6,757	88	0.74	0.01	81	0.38	0.01	72	0.70	0.02
Other Hispanic	562	80	0.89	0.07	73	0.36	0.03	79	0.97	0.06
Other Race—Including Multiple	749	84	0.84	0.06	78	0.41	0.03	80	1.00	0.10

N = Sample size.
SE = Standard error.

Source: U.S. EPA analysis of 2003−2006 NHANES data.

Table 11-6. Consumer-Only Intake of Individual Meats and Dairy Products Based on 2003−2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	*N*	Mean	SE	*N*	Mean	SE
	Beef			Pork			Poultry		
Whole Population	14,328	0.88	0.01	13,180	0.49	0.01	12,660	1.03	0.02
Age Group									
Birth to 1 year	233	1.28	0.20	172	0.93	0.17	315	1.89	0.16
1 to 2 years	893	1.65	0.08	781	1.03	0.08	880	2.32	0.07
3 to 5 years	879	1.56	0.08	784	1.00	0.07	800	2.02	0.08
6 to 12 years	2,102	1.20	0.04	1,922	0.62	0.02	1,813	1.54	0.08
13 to 19 years	3,140	0.91	0.03	2,770	0.46	0.02	2,652	1.07	0.03
20 to 49 years	3,767	0.84	0.02	3,539	0.44	0.01	3,360	0.92	0.02
Females 13 to 49 years old	3,585	0.70	0.02	3,283	0.36	0.01	3,224	0.86	0.03
50 years and older	3,314	0.66	0.01	3,212	0.40	0.01	2,840	0.70	0.02
Race									
Mexican American	3,679	1.09	0.03	3,595	0.50	0.02	3,371	1.05	0.03
Non-Hispanic Black	3,751	0.90	0.03	3,312	0.51	0.03	3,522	1.21	0.03
Non-Hispanic White	5,843	0.84	0.02	5,304	0.48	0.01	4,769	0.97	0.02
Other Hispanic	450	1.11	0.06	397	0.50	0.05	434	1.23	0.07
Other Race—Including Multiple	605	1.00	0.06	572	0.53	0.04	564	1.26	0.10

N = Sample size.
SE = Standard error.

Source: U.S. EPA analysis of 2003−2006 NHANES data.

Table 11-7. Mean Meat Intakes per Individual in a Day, by Sex and Age (g/day, as-consumed)[a] for 1977−1978

Group Age (years)	Total Meat, Poultry and Fish	Beef	Pork	Lamb, Veal, Game	Frankfurters, Sausages, Luncheon Meats, Spreads	Total Poultry	Chicken Only	Meat Mixtures[b]
Males and Females								
1 and Under	72	9	4	3	2	4	1	51
1 to 2	91	18	6	-[c]	15	16	13	32
3 to 5	121	23	8	-[c]	15	19	19	49
6 to 8	149	33	15	1	17	20	19	55
Males								
9 to 11	188	41	22	3	19	24	21	71
12 to 14	218	53	18	-[c]	25	27	24	87
15 to 18	272	82	24	1	25	37	32	93
19 to 22	310	90	21	2	33	45	43	112
23 to 34	285	86	27	1	30	31	29	94
35 to 50	295	75	28	1	26	31	28	113
51 to 64	274	70	32	1	29	31	29	86
65 to 74	231	54	25	2	22	29	26	72
75 and Over	196	41	39	7	19	28	25	54
Females								
9 to 11	162	38	17	1	20	27	23	55
12 to 14	176	47	19	1	18	23	22	61
15 to 18	180	46	14	2	16	28	27	61
19 to 22	184	52	19	1	18	26	24	61
23 to 34	183	48	17	1	16	24	22	66
35 to 50	187	49	19	2	14	24	21	63
51 to 64	187	52	19	2	12	26	24	60
65 to 74	159	34	21	4	12	30	25	47
75 and Over	134	31	17	2	9	19	16	49
Males and Females								
All Ages	207	54	20	2	20	27	24	72

[a] Based on USDA Nationwide Food Consumption Survey 1977−1978 data for 1 day.
[b] Includes mixtures containing meat, poultry, or fish as a main ingredient.
[c] Less than 0.5 g/day, but more than 0.
- Indicates data are not available.
Source: USDA (1980).

Table 11-8. Mean Meat Intakes per Capita in a Day, by Sex and Age (g/day, as-consumed)[a] for 1987−1988

Group Age (years)	Total Meat, Poultry, and Fish	Beef	Pork	Lamb, Veal, Game	Frankfurters, Sausages, Luncheon Meats	Total Poultry	Chicken Only	Meat Mixtures[b]
Males and Females								
5 and Under	92	10	9	<0.5	11	14	12	39
Males								
6 to 11	156	22	14	<0.5	13	27	24	74
12 to 19	252	38	17	1	20	27	20	142
20 and over	250	44	19	23	2	31	25	108
Females								
6 to 11	151	26	9	1	11	20	17	74
12 to 19	169	31	10	<0.5	18	17	13	80
20 and over	170	29	12	1	13	24	18	73
All individuals	193	32	14	1	17	26	20	86

[a] Based on USDA Nationwide Food Consumption Survey 1987−1988 data for 1 day.

[b] Includes mixtures containing meat, poultry, or fish as a main ingredient.

Source: USDA (1993).

Table 11-9. Mean Meat Intakes per Capita in a Day, by Sex and Age (g/day, as-consumed)[a] for 1994 and 1995

Group Age (years)	Total Meat, Poultry, and Fish		Beef		Pork		Lamb, Veal, Game		Frankfurters, Sausages, Luncheon Meats		Total Poultry		Chicken Only		Meat Mixtures[b]	
	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995
Males and Females																
5 and Under	94	87	10	8	6	4	-[c]	-[c]	17	18	16	15	14	14	41	39
Males																
6 to 11	131	161	19	18	9	7	0	-[c]	22	27	19	25	16	22	51	68
12 to 19	238	256	31	29	11	11	1	1	21	27	40	26	29	23	119	150
20 and over	266	283	35	41	17	14	2	1	29	27	39	31	30	27	124	149
Females																
6 to 11	117	136	18	16	5	5	-[c]	-[c]	18	20	19	17	15	14	51	69
12 to 19	164	158	23	22	5	7	-[c]	0	16	10	20	19	15	18	94	82
20 and over	168	167	18	21	9	11	1	1	16	15	25	22	20	19	87	83
All individuals	195	202	24	27	11	10	1	1	21	21	29	24	23	21	98	104

[a] Based on USDA CSFII 1994 and 1995 data for 1 day.

[b] Includes mixtures containing meat, poultry, or fish as a main ingredient.

[c] Less than 0.5 grams/day, but more than 0.

Source: USDA (1996a, b).

Table 11-10. Mean Dairy Product Intakes per Capita in a Day, by Sex and Age (g/day, as-consumed)[a] for 1977−1978

Group Age (years)	Total Milk	Fluid Milk	Cheese	Eggs
Males and Females				
1 and Under	618	361	1	5
1 to 2	404	397	8	20
3 to 5	353	330	9	22
6 to 8	433	401	10	18
Males				
9 to 11	432	402	8	26
12 to 14	504	461	9	28
15 to 18	519	467	13	31
19 to 22	388	353	15	32
23 to 34	243	213	21	38
35 to 50	203	192	18	41
51 to 64	180	173	17	36
65 to 74	217	204	14	36
75 and Over	193	184	18	41
Females				
9 to 11	402	371	7	14
12 to 14	387	343	11	19
15 to 18	316	279	11	21
19 to 22	224	205	18	26
23 to 34	182	158	19	26
35 to 50	130	117	18	23
51 to 64	139	128	19	24
65 to 74	166	156	14	22
75 and Over	214	205	20	19

[a] Based on USDA Nationwide Food Consumption Survey 1977−1978 data for 1 day.

Source: USDA (1980).

Table 11-11. Mean Dairy Product Intakes per Capita in a Day, by Sex and Age (g/day, as-consumed)[a] for 1987−1988

Group Age (years)	Total Fluid Milk	Whole Milk	Lowfat/Skim Milk	Cheese	Eggs
Males and Females					
5 and under	347	177	129	7	11
Males					
6 to 11	439	224	159	10	17
12 to 19	392	183	168	12	17
20 and over	202	88	94	17	27
Females					
6 to 11	310	135	135	9	14
12 to 19	260	124	114	12	18
20 and over	148	55	81	15	17
All individuals	224	99	102	14	20

[a] Based on USDA Nationwide Food Consumption Survey 1987−1988 data for 1 day.

Source: USDA (1993).

Table 11-12. Mean Dairy Product Intakes per Capita in a Day, by Sex and Age (g/day, as-consumed)[a] for 1994 and 1995

Group Age (years)	Total Fluid Milk		Whole Milk		Lowfat Milk		Cheese		Eggs	
	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995
Males and Females										
5 and under	424	441	169	165	130	129	12	9	11	13
Males										
6 to 11	407	400	107	128	188	164	11	12	13	15
12 to 19	346	396	105	105	160	176	19	20	18	24
20 and over	195	206	50	57	83	88	19	16	23	23
Females										
6 to 11	340	330	101	93	136	146	17	13	12	15
12 to 19	239	235	75	71	88	107	14	13	13	17
20 and over	157	158	37	32	56	57	16	15	15	16
All individuals	229	236	65	66	89	92	17	15	17	19

[a] Based on USDA CSFII 1994 and 1995 data for 1 day.

Source: USDA (1996a, b).

Table 11-13. Mean Quantities of Meat and Eggs Consumed Daily by Sex and Age, per Capita (g/day, as-consumed)[a]

Age Group	Sample Size	Total	Beef	Pork	Lamb, Veal, Game	Organ Meats	Frankfurters, Sausages, Luncheon Meats	Poultry		Eggs	Mixtures, Mainly Meat/Poultry/ Fish
								Total	Chicken		
Males and Females											
Under 1	1,126	24	1[b]	-[b,c]	-[b,c]	-[b,c]	2	3	2	3	16
1	1,016	80	5	2	-[b,c]	-[b,c]	13	12	12	13	43
2	1,102	94	7	6	-[b,c]	-[b,c]	18	17	16	18	41
1 to 2	2,118	87	6	4	-[b,c]	-[b,c]	15	15	14	16	42
3	1,831	101	8	6	-[b,c]	-[b,c]	19	19	18	13	43
4	1,859	115	10	6	-[b,c]	-[b,c]	22	20	19	13	49
5	884	121	14	6	-[b,c]	-[b,c]	22	22	19	13	51
3 to 5	4,574	112	11	6	-[c]	-[b,c]	21	21	19	13	47
5 and under	7,818	93	8	5	-[c]	-[b,c]	17	16	15	13	42
Males											
6 to 9	787	151	18	7	-[b,c]	-[b,c]	24	23	21	11	71
6 to 11	1,031	154	19	7	-[b,c]	-[b,c]	24	22	20	12	72
12 to 19	737	250	30	12	1[b]	0	28	31	26	22	134
Females											
6 to 9	704	121	17	4	-[b,c]	-[b,c]	18	19	16	10	55
6 to 11	969	130	18	5	-[b,c]	-[b,c]	19	20	17	11	60
12 to 19	732	158	21	5	-[b,c]	-[b,c]	15	21	19	13	85
Males and Females											
9 and under	9,309	110	12	5	-[c]	-[b,c]	19	18	17	12	50
19 and under	11,287	152	18	7	-[b,c]	-[b,c]	20	22	19	14	76

[a] Based on data from 1994−1996, 1998 CSFII.

[b] Estimate is not statistically reliable due to small sample size reporting intake.

[c] Value less than 0.5, but greater than 0.

Note: Consumption amounts shown are representative of the 1st day of each participant's survey response.

Source: USDA (1999a).

Table 11-14. Percentage of Individuals Consuming Meats and Eggs, by Sex and Age (%)[a]

Age Group (years)	Sample Size	Total	Beef	Pork	Lamb, Veal, Game	Organ Meats	Frankfurters, Sausages, Luncheon Meats	Poultry		Eggs	Mixtures, Mainly Meat/Poultry/ Fish
								Total	Chicken		
Males and Females											
Under 1	1,126	26.0	2.1	1.1[b]	0.2[b]	0.2[b]	6.1	6.3	5.0	6.7	13.7
1	1,016	77.4	11.9	7.3	0.8[b]	0.2[b]	26.3	24.0	23.1	22.8	32.2
2	1,102	85.2	16.2	14.9	0.8[b]	0.2[b]	33.2	27.6	25.6	27.3	31.4
1 to 2	2,118	81.4	14.1	11.2	0.8[b]	0.2[b]	29.9	25.8	24.4	25.1	31.8
3	1,831	86.2	13.8	13.3	0.5[b]	-[b,c]	36.4	28.3	26.0	19.8	29.2
4	1,859	86.2	16.1	13.8	0.5[b]	0.2[b]	37.0	27.4	25.1	16.9	30.5
5	884	87.1	18.2	13.2	0.6[b]	0.2[b]	35.1	27.7	24.8	16.4	30.8
3 to 5	4,574	86.5	16.0	13.4	0.5	0.2[b]	36.1	27.8	25.3	17.7	30.2
5 and under	7,818	77.5	13.7	11.2	0.6	0.2[b]	30.4	24.5	22.6	18.9	28.8
Males											
6 to 9	787	87.4	20.1	11.9	0.4[b]	0.1[b]	37.4	24.8	22.3	15.1	36.2
6 to 11	1,031	87.8	22.0	12.2	0.4[b]	0.2[b]	36.2	22.9	20.5	15.6	35.7
12 to 19	737	86.8	24.2	15.8	0.6[b]	0.0	31.8	20.6	17.6	17.0	38.3
Females											
6 to 9	704	84.6	19.4	9.2	0.4[b]	0.2[b]	33.5	23.1	20.2	13.4	32.4
6 to 11	969	86.5	20.2	10.0	0.4[b]	0.1[b]	33.1	22.9	19.8	13.3	32.8
12 to 19	732	80.1	22.0	11.2	0.1[b]	0.1[b]	24.6	21.6	18.9	15.0	34.0
Males and Females											
9 and under	9,309	80.9	16.1	10.9	0.5	0.2[b]	24.3	24.3	22.0	17.1	31.0
19 and under	11,287	82.8	19.6	12.1	0.4	0.1[b]	22.7	22.7	20.1	16.4	33.3

[a] Based on data from 1994−1996, 1998 CSFII.
[b] Estimate is not statistically reliable due to small sample size reporting intake.
[c] Value less than 0.5, but greater than 0.
Note: Percentages shown are representative of the 1st day of each participant's survey response.

Source: USDA (1999a).

Table 11-15. Mean Quantities of Dairy Products Consumed Daily by Sex and Age, per Capita (g/day, as-consumed)[a]

Age Group (year)	Sample Size	Total Milk and Milk Products	Milk, Milk Drinks, Yogurt						Milk Desserts	Cheese
			Total	Fluid Milk				Yogurt		
				Total	Whole	Lowfat	Skim			
Males and Females										
Under 1	1,126	762	757	61	49	11	-[b,c]	4	3	1
1	1,016	546	526	475	347	115	5[b]	14	11	9
2	1,102	405	377	344	181	141	17	10	16	11
1 to 2	2,118	474	450	408	262	128	11	12	14	10
3	1,831	419	384	347	166	150	26	10	22	12
4	1,859	407	369	328	147	149	27	10	23	14
5	884	417	376	330	137	159	25	9	25	14
3 to 5	4,574	414	376	335	150	153	26	10	23	13
5 and under	7,818	477	447	327	177	127	18	10	18	11
Males										
6 to 9	787	450	405	343	127	176	29	6	31	13
6 to 11	1,031	450	402	335	121	172	33	6	35	12
12 to 19	737	409	358	303	99	158	40	3[b]	29	19
Females										
6 to 9	704	380	337	288	105	146	26	4	29	13
6 to 11	969	382	336	283	108	136	29	4	30	14
12 to 19	732	269	220	190	66	92	30	4[b]	29	14
Males and Females										
9 and under	9,309	453	417	323	153	141	22	8	23	12
19 and under	11,287	405	362	291	121	135	29	6	27	14

[a] Based on data from 1994−1996, 1998 CSFII.

[b] Estimate is not statistically reliable due to small sample size reporting intake.

[c] Value less than 0.5, but greater than 0.

Note: Consumption amounts shown are representative of the 1st day of each participant's survey response.

Source: USDA (1999a).

Table 11-16. Percentage of Individuals Consuming Dairy Products, by Sex and Age (%)[a]

Age Group (year)	Sample Size	Total Milk and Milk Products	Milk, Milk Drinks, Yogurt						Milk Desserts	Cheese
			Total	Fluid Milk				Yogurt		
				Total	Whole	Lowfat	Skim			
Males and Females										
Under 1	1,126	85.4	84.6	11.1	8.3	2.4	0.2[b]	3.1	4.5	6.0
1	1,016	95.3	92.7	87.7	61.7	26.5	1.5[b]	10.0	13.9	29.7
2	1,102	91.6	87.3	84.3	44.8	36.3	5.2	6.8	17.5	32.6
1 to 2	2,118	93.4	90.0	86.0	53.0	31.5	3.4	8.4	15.8	31.2
3	1,831	94.3	88.3	84.6	42.5	39.5	6.8	7.3	21.4	37.0
4	1,859	93.2	87.8	85.0	41.3	40.4	7.7	5.8	21.7	36.9
5	884	93.1	86.4	81.2	38.1	41.7	6.5	5.5	21.4	34.9
3 to 5	4,574	93.5	87.5	83.6	40.6	40.6	7.0	6.2	21.5	36.3
5 and under	7,818	92.5	88.0	75.7	41.0	32.9	4.9	6.6	17.5	30.9
Males										
6 to 9	787	93.2	85.5	80.7	32.4	44.3	8.6	3.8	24.0	34.6
6 to 11	1,031	92.3	84.6	79.0	30.8	43.1	9.5	3.7	25.0	32.3
12 to 19	737	81.3	65.8	59.6	22.6	30.7	7.0	1.7[b]	13.6	37.1
Females										
6 to 9	704	90.2	82.5	77.5	31.5	40.8	8.1	2.9	24.1	30.9
6 to 11	969	90.2	81.5	76.0	33.2	37.8	8.4	3.0	22.4	31.9
12 to 19	732	75.4	54.0	49.7	17.5	23.9	9.5	2.2[b]	17.1	36.1
Males and Females										
9 and under	9,309	92.2	86.4	77.1	37.4	36.8	6.3	5.3	20.1	31.7
19 and under	11,287	86.7	75.6	68.1	30.1	33.1	7.5	3.8	18.6	33.5

[a] Based on data from 1994−1996, 1998 CSFII.

[b] Estimate is not statistically reliable due to small sample size reporting intake.

Note: Percentages shown are representative of the 1st day of each participant's survey response.

Source: USDA (1999a).

Table 11-17. Per Capita Intake of Total Meat and Total Dairy Products (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Percent Consuming	Mean	SE	Percentiles									
					1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
					Total Meat									
Whole Population	20,607	97.5	2.1	0.02	0.0	0.2	0.5	1.0	1.7	2.7	4.0	5.3	8.7	30.3
Age Group														
Birth to 1 year	1,486	40.0	1.2	0.1	0.0	0.0	0.0	0.0	0.0	1.6	4.2	6.7	10.7	29.6
1 to 2 years	2,096	97.3	4.1	0.1	0.0	0.2	0.8	1.9	3.6	5.7	8.0	9.8	14.1	20.6
3 to 5 years	4,391	98.8	4.1	0.05	0.0	0.6	1.2	2.2	3.6	5.4	7.7	9.4	12.7	23.4
6 to 12 years	2,089	98.7	2.9	0.05	0.0	0.4	0.8	1.5	2.5	3.8	5.4	6.5	9.6	18.0
13 to 19 years	1,222	98.8	2.1	0.05	0.0	0.2	0.5	1.0	1.9	2.7	3.8	4.8	7.1	30.3
20 to 49 years	4,677	98.2	1.9	0.04	0.0	0.2	0.5	1.0	1.6	2.5	3.5	4.2	6.9	13.4
50+ years	4,646	98.2	1.5	0.02	0.0	0.2	0.4	0.8	1.3	1.9	2.7	3.3	4.8	9.7
Season														
Fall	4,687	96.8	2.1	0.06	0.0	0.1	0.5	1.0	1.7	2.8	4.2	5.4	8.7	21.2
Spring	5,308	97.6	2.1	0.04	0.0	0.2	0.5	1.0	1.7	2.7	4.0	5.2	8.7	23.6
Summer	5,890	97.4	2.1	0.03	0.0	0.1	0.5	0.9	1.6	2.7	4.0	5.4	8.6	30.3
Winter	4,722	98.0	2.0	0.04	0.0	0.2	0.5	1.0	1.6	2.6	3.8	5.0	7.9	29.6
Race														
American Indian, Alaska Native	177	98.4	2.4	0.25	0.0	0.3	0.5	1.0	2.0	3.3	4.3	6.3	9.0	12.4
Asian, Pacific Islander	557	96.8	2.5	0.17	0.0	0.1	0.3	1.1	2.1	3.5	4.5	6.0	9.6	13.0
Black	2,740	97.9	2.6	0.10	0.0	0.3	0.6	1.2	2.0	3.3	5.4	7.1	10.4	23.6
Other	1,638	96.5	2.5	0.08	0.0	0.2	0.5	1.1	2.0	3.1	4.9	6.5	10.8	29.6
White	15,495	97.5	1.9	0.02	0.0	0.2	0.5	0.9	1.6	2.5	3.7	4.8	7.7	30.3
Region														
Midwest	4,822	97.9	2.2	0.04	0.0	0.3	0.6	1.1	1.8	2.8	4.1	5.3	9.1	30.3
Northeast	3,692	96.3	2.1	0.07	0.0	0.0	0.4	0.9	1.6	2.7	4.1	5.4	8.7	20.5
South	7,208	97.7	2.0	0.03	0.0	0.2	0.5	0.9	1.7	2.6	3.9	5.2	8.3	23.4
Midwest	4,822	97.9	2.2	0.04	0.0	0.3	0.6	1.1	1.8	2.8	4.1	5.3	9.1	30.3
West	4,885	97.6	2.0	0.06	0.0	0.2	0.4	0.9	1.6	2.7	4.0	5.2	8.1	29.6
Urbanization														
MSA, Central City	6,164	97.3	2.1	0.04	0.0	0.1	0.5	0.9	1.7	2.7	4.2	5.6	8.9	23.6
MSA, Outside Central City	9,598	97.3	2.0	0.04	0.0	0.2	0.5	1.0	1.6	2.6	3.9	5.1	8.0	29.6
Non-MSA	4,845	98.1	2.1	0.03	0.0	0.3	0.6	1.0	1.7	2.7	4.1	5.1	8.6	30.3

Table 11-17. Per Capita Intake of Total Meat and Total Dairy Products Based on 1994−1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight) (continued)

Population Group	*N*	Percent Consuming	Mean	SE	Percentiles									
					1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Total Dairy Product														
Whole population	20,607	99.5	6.7	0.1	0.01	0.2	0.4	1.2	3.2	7.3	16.1	25.4	52.1	223
Age Group														
Birth to 1 year	1,486	79.5	12.6	0.9	0.0	0.0	0.0	1.0	8.0	14.1	24.1	48.7	127	186
1 to 2 years	2,096	99.8	36.7	0.7	0.4	3.9	7.7	17.4	31.3	49.8	72.1	88.3	126	223
3 to 5 years	4,391	100.0	23.3	0.3	1.1	4.2	7.0	13.0	20.8	30.9	42.0	49.4	67.7	198
6 to 12 years	2,089	100.0	13.6	0.4	0.3	1.8	3.5	6.7	11.7	18.5	26.0	31.5	42.7	80.6
13 to 19 years	1,222	99.8	5.6	0.2	0.01	0.2	0.5	1.5	4.2	8.1	12.5	15.5	25.4	32.7
20 to 49 years	4,677	99.8	3.3	0.1	0.01	0.2	0.3	0.9	2.2	4.6	7.6	9.9	14.9	36.4
50+ years	4,646	99.8	3.2	0.1	0.02	0.2	0.4	1.0	2.4	4.5	6.9	8.9	14.1	42.5
Season														
Fall	4,687	99.7	7.0	0.2	0.0	0.2	0.4	1.3	3.4	8.0	16.9	26.9	55.3	156.8
Spring	5,308	99.5	6.6	0.2	0.0	0.2	0.4	1.3	3.1	7.3	16.2	25.0	52.0	185.6
Summer	5,890	99.6	6.4	0.2	0.0	0.2	0.4	1.2	3.1	6.8	15.2	24.7	52.8	164.8
Winter	4,722	99.4	6.7	0.1	0.0	0.2	0.5	1.3	3.4	7.3	16.4	25.0	49.1	223.2
Race														
American Indian, Alaska Native	177	99.8	8.0	1.1	0.0	0.0	0.1	0.8	3.1	11.0	21.2	30.2	68.9	146.2
Asian, Pacific Islander	557	97.0	6.4	0.4	0.0	0.0	0.0	0.6	3.0	7.4	14.9	28.1	51.7	164.8
Black	2,740	99.6	5.6	0.2	0.0	0.1	0.2	0.6	2.1	6.5	14.7	23.3	45.4	185.6
Other	1,638	99.1	9.5	0.6	0.0	0.1	0.4	1.3	4.2	11.5	25.4	36.3	69.3	185.2
White	15,495	99.6	6.6	0.1	0.0	0.3	0.5	1.4	3.4	7.2	15.6	24.7	51.2	223.2
Region														
Midwest	4,822	99.7	7.0	0.3	0.0	0.3	0.5	1.4	3.5	7.7	16.9	25.8	52.7	198.4
Northeast	3,692	99.6	6.7	0.2	0.0	0.3	0.6	1.5	3.4	7.3	15.9	25.7	54.2	185.6
South	7,208	99.6	6.0	0.1	0.0	0.2	0.3	1.0	2.8	6.3	14.5	23.7	48.6	223.2
West	4,885	99.2	7.4	0.4	0.0	0.2	0.4	1.4	3.7	8.5	17.5	27.6	54.5	185.2
Urbanization														
MSA, Central City	6,164	99.6	6.5	0.2	0.0	0.2	0.4	1.1	3.2	7.1	15.8	25.1	49.8	198.4
MSA, Outside Central City	9,598	99.4	7.0	0.1	0.0	0.2	0.5	1.4	3.4	7.7	16.9	26.3	54.3	223.2
Non-MSA	4,845	99.7	6.3	0.3	0.0	0.2	0.4	1.1	3.0	6.8	15.0	23.9	51.4	180.7

N = Sample size.
SE = Standard error.
MSA = Metropolitan statistical area.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 11-18. Consumer-Only Intake of Total Meat and Total Dairy Products Based on 1994−1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	Percentiles									
				1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Total Meat													
Age Group													
Birth to 1 year	575	3.0	0.2	0.01	0.1	0.3	1.0	2.2	4.2	7.4	9.2	12.9	29.6
1 to 2 years	2,044	4.2	0.1	0.04	0.6	1.0	2.1	3.6	5.7	8.1	9.8	14.1	20.6
3 to 5 years	4,334	4.2	0.1	0.04	0.8	1.2	2.2	3.6	5.5	7.7	9.4	12.7	23.4
6 to 12 years	2,065	2.9	0.1	0.1	0.5	0.9	1.5	2.5	3.9	5.4	6.5	9.6	18.0
13 to 19 years	1,208	2.1	0.05	0.02	0.3	0.6	1.1	1.9	2.8	3.8	4.8	7.1	30.3
20 to 49 years	4,593	1.9	0.04	0.04	0.4	0.6	1.0	1.6	2.5	3.5	4.2	6.9	13.4
50+ years	4,565	1.5	0.02	0.03	0.3	0.5	0.8	1.3	2.0	2.7	3.3	4.8	9.7
Whole population	19,384	2.1	0.02	0.04	0.4	0.6	1.0	1.7	2.7	4.0	5.3	8.7	30.3
Season													
Fall	4,423	96.8	2.2	0.06	0.0	0.4	0.6	1.0	1.7	2.8	4.2	5.5	8.7
Spring	4,995	97.6	2.1	0.04	0.0	0.3	0.6	1.0	1.7	2.7	4.1	5.2	8.8
Summer	5,510	97.4	2.1	0.03	0.0	0.3	0.5	1.0	1.7	2.7	4.0	5.5	8.7
Winter	4,456	98.0	2.0	0.04	0.0	0.4	0.6	1.0	1.7	2.6	3.9	5.0	7.9
Race													
American Indian, Alaska Native	171	98.4	2.5	0.27	0.2	0.4	0.5	1.1	2.1	3.3	4.3	6.3	9.0
Asian, Pacific Islander	503	96.8	2.6	0.18	0.0	0.3	0.6	1.2	2.3	3.5	4.5	6.0	9.6
Black	2,588	97.9	2.6	0.10	0.0	0.5	0.7	1.2	2.0	3.3	5.4	7.2	10.5
Other	1,508	96.5	2.6	0.09	0.1	0.4	0.7	1.2	2.0	3.2	5.0	6.6	10.9
White	14,614	97.5	2.0	0.02	0.0	0.3	0.5	1.0	1.6	2.5	3.7	4.8	7.7
Region													
Midwest	4,573	97.9	2.2	0.04	0.1	0.4	0.7	1.1	1.8	2.8	4.1	5.3	9.2
Northeast	3,448	96.3	2.1	0.07	0.0	0.4	0.5	1.0	1.7	2.7	4.2	5.5	8.7
South	6,798	97.7	2.1	0.03	0.0	0.3	0.5	1.0	1.7	2.7	3.9	5.2	8.3
West	4,565	97.6	2.1	0.06	0.0	0.3	0.5	1.0	1.6	2.7	4.0	5.2	8.1
Urbanization													
MSA, Central City	5,783	97.3	2.2	0.04	0.0	0.3	0.5	1.0	1.7	2.8	4.2	5.6	9.1
MSA, Outside Central City	9,004	97.3	2.1	0.04	0.0	0.3	0.6	1.0	1.7	2.6	3.9	5.2	8.0
Non-MSA	4,597	98.1	2.2	0.02	0.0	0.4	0.6	1.1	1.7	2.8	4.1	5.1	8.6

Table 11-18. Consumer-Only Intake of Total Meat and Total Dairy Products Based on 1994−1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight) (continued)

Population Group	*N*	Mean	SE	Percentiles									
				1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Total Dairy Product													
Whole population	20,287	6.7	0.1	0.02	0.2	0.4	1.3	3.3	7.4	16.2	25.5	52.2	223.2
Age Group													
Birth to 1 year	1,192	15.9	1.0	0.03	0.8	1.9	5.8	10.2	16.0	27.7	57.5	141.8	185.6
1 to 2 years	2,093	36.8	0.7	0.4	4.2	7.8	17.4	31.3	49.8	72.1	88.3	126.2	223.2
3 to 5 years	4,390	23.3	0.3	1.1	4.2	7.0	13.0	20.8	30.9	42.0	49.4	67.7	198.4
6 to 12 years	2,089	13.6	0.4	0.3	1.8	3.5	6.7	11.7	18.5	26.0	31.5	42.7	80.6
13 to 19 years	1,221	5.6	0.2	0.01	0.3	0.5	1.5	4.2	8.1	12.5	15.5	25.4	32.7
20 to 49 years	4,666	3.3	0.1	0.01	0.2	0.3	0.9	2.3	4.6	7.6	9.9	14.9	36.4
50+ years	4,636	3.2	0.1	0.02	0.2	0.4	1.1	2.4	4.5	6.9	8.9	14.1	42.5
Season													
Fall	4,630	99.7	7.1	0.2	0.0	0.2	0.5	1.3	3.4	8.0	16.9	26.9	55.4
Spring	5,210	99.5	6.6	0.2	0.0	0.2	0.4	1.3	3.2	7.3	16.3	25.1	52.1
Summer	5,801	99.6	6.4	0.2	0.0	0.2	0.4	1.2	3.1	6.8	15.2	24.7	53.0
Winter	4,646	99.4	6.7	0.1	0.0	0.2	0.5	1.3	3.4	7.3	16.5	25.1	49.2
Race													
American Indian, Alaskan Native	176	99.8	8.0	1.1	0.0	0.0	0.1	0.8	3.1	11.1	21.2	30.2	68.9
Asian, Pacific Islander	537	97.0	6.6	0.4	0.0	0.0	0.1	0.6	3.1	7.6	15.6	28.1	51.7
Black	2,708	99.6	5.7	0.2	0.0	0.1	0.2	0.6	2.1	6.6	14.8	23.4	45.4
Other	1,607	99.1	9.6	0.7	0.0	0.2	0.4	1.3	4.3	11.6	25.5	36.5	69.3
White	15,259	99.6	6.7	0.1	0.0	0.3	0.6	1.4	3.4	7.2	15.7	24.7	51.3
Region													
Midwest	4,765	99.7	7.1	0.3	0.1	0.3	0.6	1.4	3.5	7.8	16.9	25.8	52.7
Northeast	3,638	99.6	6.8	0.2	0.0	0.3	0.6	1.5	3.4	7.3	16.0	25.8	54.3
South	7,104	99.6	6.0	0.1	0.0	0.2	0.3	1.0	2.8	6.3	14.6	23.8	48.6
West	4,780	99.2	7.4	0.4	0.0	0.2	0.5	1.5	3.8	8.5	17.8	27.7	54.6
Urbanization													
MSA, Central City	6,072	99.6	6.5	0.2	0.0	0.2	0.4	1.2	3.2	7.2	15.9	25.2	49.8
MSA, Outside Central City	9,440	99.4	7.0	0.1	0.0	0.3	0.5	1.4	3.5	7.8	17.0	26.4	54.3
Non-MSA	4,775	99.7	6.3	0.3	0.0	0.2	0.4	1.1	3.0	6.8	15.0	23.9	51.5

N = Sample size.
SE = Standard error.
MSA = Metropolitan statistical area.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 11-19. Per Capita Intake of Individual Meats and Dairy Products Based on 1994−1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
		Beef			Pork			Poultry			Eggs		
Whole population	20,607	85.9	0.9	0.02	78.5	0.42	0.01	67.6	0.71	0.01	93.4	0.40	0.01
Age Group													
Birth to 1 year	1,486	25.3	0.4	0.04	17.7	0.15	0.02	30.1	0.66	0.05	27.9	0.30	0.04
1 to 2 years	2,096	85.5	1.7	0.06	69.7	0.72	0.03	73.7	1.7	0.05	92.3	1.3	0.04
3 to 5 years	4,391	90.8	1.8	0.04	79.8	0.84	0.02	73.0	1.5	0.03	95.1	0.91	0.03
6 to 12 years	2,089	92.7	1.3	0.04	82.4	0.59	0.03	67.1	0.93	0.03	95.8	0.51	0.02
13 to 19 years	1,222	91.1	1.0	0.05	81.5	0.40	0.03	65.5	0.68	0.03	95.4	0.33	0.02
20 to 49 years	4,677	86.1	0.8	0.03	78.9	0.37	0.01	69.0	0.64	0.02	94.1	0.31	0.01
50+ years	4,646	83.5	0.6	0.02	79.3	0.34	0.01	66.5	0.52	0.02	94.0	0.33	0.01
Season													
Fall	4,687	85.0	0.9	0.05	78.5	0.41	0.02	69.7	0.76	0.03	93.1	0.39	0.02
Spring	5,308	86.4	0.9	0.03	78.1	0.44	0.02	66.8	0.70	0.02	93.5	0.41	0.02
Summer	5,890	85.7	0.9	0.03	78.1	0.42	0.02	65.4	0.69	0.02	93.3	0.39	0.01
Winter	4,722	86.7	0.9	0.02	79.1	0.40	0.02	68.6	0.70	0.02	93.8	0.39	0.02
Race													
American Indian, Alaskan Native	177	87.9	1.3	0.21	85.2	0.49	0.06	78.1	0.62	0.07	94.5	0.49	0.06
Asian, Pacific Islander	557	78.6	0.9	0.08	71.5	0.63	0.11	78.1	0.90	0.09	84.7	0.46	0.05
Black	2,740	85.3	1.1	0.10	82.1	0.53	0.04	73.3	0.93	0.05	93.9	0.48	0.01
Other	1,638	85.0	1.1	0.05	79.4	0.48	0.03	68.7	0.83	0.06	89.9	0.62	0.05
White	15,495	86.4	0.9	0.02	78.0	0.39	0.01	66.1	0.66	0.01	93.9	0.36	0.01
Region													
Midwest	4,822	89.8	1.0	0.02	83.1	0.47	0.02	66.9	0.69	0.03	95.1	0.38	0.01
Northeast	3,692	82.0	0.8	0.08	72.1	0.41	0.02	68.3	0.78	0.04	91.2	0.36	0.02
South	7,208	86.1	0.9	0.02	79.8	0.42	0.02	67.2	0.70	0.02	94.2	0.39	0.01
West	4,885	85.1	0.9	0.04	77.0	0.36	0.03	68.4	0.70	0.03	92.5	0.44	0.02
Urbanization													
MSA, Central City	6,164	84.0	0.9	0.04	77.1	0.41	0.02	70.6	0.78	0.02	92.8	0.41	0.01
MSA, Outside Central City	9,598	85.9	0.9	0.02	77.2	0.39	0.01	68.5	0.72	0.02	93.4	0.39	0.01
Non-MSA	4,845	88.9	1.0	0.04	83.3	0.49	0.02	61.1	0.60	0.03	94.5	0.39	0.01

N =Sample size.
SE =Standard error.
MSA = Metropolitan statistical area.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 11-20. Consumer-Only Intake of Individual Meats and Dairy Products Based on 1994−1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	*N*	Mean	SE	*N*	Mean	SE	*N*	Mean	SE
	Beef			Pork			Poultry			Eggs		
Whole population	17,116	1.1	0.02	15,431	0.53	0.01	13,702	1.1	0.01	18,450	0.42	0.01
Age Group												
Birth to 1 year	361	1.6	0.2	248	0.83	0.08	434	2.2	0.1	402	1.1	0.1
1 to 2 years	1,795	2.0	0.06	1,488	1.0	0.04	1,552	2.2	0.06	1,936	1.4	0.04
3 to 5 years	3,964	1.9	0.04	3,491	1.1	0.03	3,210	2.0	0.04	4,171	0.96	0.03
6 to 12 years	1,932	1.4	0.04	1,731	0.72	0.03	1,421	1.4	0.04	2,001	0.53	0.02
13 to 19 years	1,118	1.1	0.05	1,002	0.50	0.03	808	1.0	0.04	1,167	0.34	0.02
20 to 49 years	4,058	1.0	0.04	3,732	0.47	0.01	3,221	0.9	0.02	4,399	0.33	0.01
50+ years	3,888	0.7	0.02	3,739	0.43	0.01	3,056	0.8	0.02	4,374	0.35	0.01
Season												
Fall	3,894	1.1	0.06	3,547	0.5	0.02	3,217	1.1	0.03	4,211	0.4	0.02
Spring	4,429	1.0	0.03	3,979	0.6	0.02	3,491	1.1	0.02	4,751	0.4	0.02
Summer	4,855	1.1	0.03	4,354	0.5	0.02	3,810	1.1	0.03	5,245	0.4	0.01
Winter	3,938	1.0	0.02	3,551	0.5	0.02	3,184	1.0	0.03	4,243	0.4	0.02
Race												
American Indian, Alaskan Native	157	1.5	0.15	144	0.6	0.05	116	0.8	0.08	159	0.5	0.07
Asian, Pacific Islander	413	1.2	0.08	359	0.9	0.14	410	1.2	0.11	434	0.5	0.06
Black	2,280	1.3	0.11	2,122	0.6	0.04	2,025	1.3	0.05	2,462	0.5	0.02
Other	1,296	1.3	0.06	1,152	0.6	0.04	1,125	1.2	0.07	1,404	0.7	0.05
White	12,970	1.0	0.02	11,654	0.5	0.01	10,026	1.0	0.02	13,991	0.4	0.01
Region												
Midwest	4,179	1.1	0.02	3,856	0.6	0.01	3,115	1.0	0.03	4,398	0.4	0.01
Northeast	2,936	1.0	0.08	2,502	0.6	0.02	2,522	1.1	0.03	3,236	0.4	0.02
South	6,029	1.0	0.02	5,517	0.5	0.02	4,770	1.0	0.02	6,510	0.4	0.01
West	3,972	1.1	0.04	3,556	0.5	0.03	3,295	1.0	0.03	4,306	0.5	0.02
Urbanization												
MSA, Central City	4,992	1.1	0.05	4,516	0.5	0.02	4,275	1.1	0.02	5,475	0.4	0.01
MSA, Outside Central City	7,937	1.0	0.02	7,028	0.5	0.02	6,461	1.0	0.02	8,565	0.4	0.01
Non-MSA	4,187	1.1	0.03	3,887	0.6	0.02	2,966	1.0	0.03	4,410	0.4	0.01

N =Sample size.
SE=Standard error.
MSA = Metropolitan statistical area.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 11-21. Quantity (as-consumed) of Meat and Dairy Products Consumed per Eating Occasion and Percentage of Individuals Using These Foods in Two Days

	Quantity Consumed per Eating Occasion (g)											
	2 to 5 years old			6 to 11 years old			12 to 19 years old					
	Males and Females (*N* = 2,109)			Males and Females (*N* = 1,432)			Males (*N* = 696)			Females (*N* = 702)		
Food category	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE
Meat												
Beef steaks	11.1	58	4	11.3	87	9	9.5	168	14	9.4	112	10
Beef roasts	5.2	49	5	4.8	67	7	5.1	233[a]	149[a]	5.5	97[a]	16[a]
Ground beef	59.5	31	1	63.7	41	1	73.4	66	3	61.5	52	3
Ham	6.9	35	4	8.5	40	4	11.6	68	7	9.9	40	5
Pork chops	11.0	48	3	10.1	62	4	11.6	100	8	8.5	72	7
Bacon	10.4	15	1	9.7	19	2	14.9	25	2	11.1	18	1
Pork breakfast sausage	5.3	33	2	6.0	32	3	6.3	40[a]	4[a]	3.3	40[a]	5[a]
Frankfurters and luncheon meats	51.7	49	1	50.9	57	2	46.7	76	3	38.5	57	3
Total chicken and turkey	63.8	46	1	53.8	62	2	58.4	100	4	54.1	71	2
Chicken	44.6	52	1	36.0	70	3	34.3	117	5	36.1	80	3
Turkey	5.1	63	7	5.7	66	5	8.2	117	14	5.8	60[a]	9[a]
Dairy Product												
Fluid milk (all)	92.5	196	3	89.2	241	4	72.3	337	8	64.4	262	8
Fluid milk consumed with cereal	68.1	149	4	64.7	202	5	44.4	276	10	42.7	222	8
Whole milk	50.0	202	3	39.5	244	7	30.0	333	13	22.4	258	7
Whole milk consumed with cereal	33.8	161	5	26.2	212	11	14.8	265	18	14.1	235	13
Lowfat milk	47.5	189	3	52.8	238	4	39.6	326	8	32.4	262	13
Lowfat milk consumed with cereal	31.5	136	4	32.7	198	4	24.3	277	12	21.1	227	12
Skim milk	7.8	171	9	11.1	225	9	9.7	375	38	13.5	255	14
Skim milk consumed with cereal	4.9	131	11	7.5	188	14	6.5	285[a]	23[a]	8.3	181	13
Cheese, other than cream or cottage	53.2	24	1	50.4	29	1	61.1	38	2	53.9	27	1
Ice cream and ice milk	18.4	92	3	21.1	135	4	14.2	221	12	15.2	187	14
Boiled, poached, and baked eggs	8.0	36	3	8.2	34	3	5.0	44[a]	9[a]	7.7	45	7
Fried eggs	17.3	48	1	14.0	58	2	14.9	83	5	13.5	59	3
Scrambled eggs	10.4	59	4	7.1	72	5	7.1	72	5	8.9	103	9

Table 11-21. Quantity (as-consumed) of Meat and Dairy Products Consumed per Eating Occasion and Percentage of Individuals Using These Foods in Two Days (continued)

	Quantity Consumed per Eating Occasion (g)																	
	20 to 39 years old						40 to 59 years old						60 years and older					
	Males (*N* = 1,543)			Females (*N* = 1,449)			Males (*N* = 1,663)			Females (*N* = 1,694)			Males (*N* = 1,545)			Females (*N* = 1,429)		
Food category	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE
Meat																		
Beef steaks	17.1	202	20	11.8	121	8	18.3	159	7	10.7	117	6	13.4	129	7	9.5	95	6
Beef roasts	6.9	132	14	5.8	85	8	9.9	119	8	9.6	74	5	11.7	102	6	8.8	80	4
Ground beef	65.3	80	4	51.5	52	2	50.0	82	3	44.6	57	2	40.7	73	3	36.2	62	3
Ham	10.8	78	7	9.7	47	4	13.5	68	5	12.2	50	4	15.2	56	3	14.4	45	3
Pork chops	12.8	117	8	12.5	71	4	14.3	108	6	13.0	67	4	16.4	89	3	13.1	62	3
Bacon	14.1	26	1	12.4	18	1	17.5	22	1	14.8	18	1	20.6	19	1	17.4	16	1
Pork breakfast sausage	6.6	57	4	5.1	37	3	6.6	48	4	5.8	38	4	10.7	48	4	5.5	34	3
Frankfurters and luncheon meats	46.2	88	6	35.6	61	2	44.9	79	2	34.3	59	2	41.6	62	2	33.9	51	2
Total chicken and turkey	57.3	112	4	57.8	78	2	56.8	111	4	58.7	80	2	53.8	87	3	57.8	71	2
Chicken	37.1	122	3	35.5	92	3	34.5	124	4	36.0	87	2	32.1	99	3	34.0	79	2
Turkey	6.8	131	21	5.6	76	6	8.5	115	12	8.8	81	8	7.7	80	7	7.2	77	7
Dairy Product																		
Fluid milk (all)	58.0	291	9	61.3	209	6	60.5	238	6	60.2	169	5	73.9	189	5	71.6	154	4
Fluid milk consumed with cereal	26.9	275	12	32.4	198	5	30.1	211	7	30.2	166	5	48.1	170	5	46.6	140	6
Whole milk	22.9	278	11	22.4	202	10	20.3	223	15	19.0	142	7	22.3	188	9	19.7	137	8
Whole milk consumed with cereal	7.9	272	16	8.7	216	14	6.2	216	16	6.1	183	10	10.1	177	10	9.9	156	13
Lowfat milk	29.4	298	15	29.4	198	7	31.2	242	7	27.7	159	5	40.2	189	5	37.8	161	6
Lowfat milk consumed with cereal	14.0	284	22	15.2	181	5	16.1	212	10	13.1	151	7	26.5	165	5	24.4	134	5
Skim milk	9.3	318	13	15.5	235	11	15.1	244	12	19.2	193	7	17.7	186	9	21.6	154	9
Skim milk consumed with cereal	5.6	260	12	9.3	207	10	8.7	197	11	11.8	173	7	12.4	174	9	14.2	135	9
Cheese, other than cream or cottage	63.8	39	2	52.6	30	1	48.3	36	1	46.3	29	1	40.9	33	2	35.4	26	1
Ice cream and ice milk	14.7	200	2	13.6	136	6	18.0	173	6	14.2	141	8	22.7	138	5	18.9	107	4
Boiled, poached, and baked eggs	9.4	50	4	10.4	39	3	12.0	45	3	14.2	38	2	15.7	45	3	16.1	39	2
Fried eggs	15.2	86	2	14.6	61	3	20.9	83	2	17.5	60	2	24.6	70	2	18.3	56	2
Scrambled eggs	10.7	89	4	7.8	74	3	11.1	83	3	8.0	66	3	12.0	73	4	9.3	64	5

[a] Indicates a statistic that is potentially unreliable because of small sample size or large coefficient of variation.

N = Sample size.

PC = Percent consuming at least once in 2 days.

SE = Standard error of the mean.

Source: Smiciklas-Wright et al. (2002), based on 1994−1996 CSFII data.

Table 11-22. Consumption of Milk, Yogurt, and Cheese: Median Daily Servings (and ranges) by Demographic and Health Characteristics

Subject Characteristic	*N*	Milk, Yogurt, and Cheese
Sex		
Females	80	1.6 (0.2−5.6)
Males	50	1.5 (0.3−7.4)
Ethnicity		
African American	44	1.9 (0.2−4.5)
European American	47	1.6 (0.2−5.6)
Native American	39	1.3 (0.5−7.4)
Age		
70 to 74 years	42	1.8 (0.3−7.4)
75 to 79 years	36	1.6 (0.2−5.6)
80 to 84 years	36	1.4 (0.2−4.5)
85+ years	16	1.6 (0.2−3.8)
Marital Status		
Married	49	1.5 (0.2−7.4)
Not Married	81	1.7 (0.2−5.4)
Education		
8th grade or less	37	1.8 (0.2−5.4)
9th to 12th grades	47	1.6 (0.2−5.6)
> High School	46	1.4 (0.3−7.4)
Denture		
Yes	83	1.5 (0.2−7.4)
No	47	1.6 (0.3−5.6)
Chronic Disease		
0	7	2.0 (0.8−4.5)
1	31	1.8 (0.3−5.6)
2	56	1.6 (0.2−7.4)
3	26	1.2 (0.2−4.8)
4+	10	1.5 (0.5−4.5)
Weight[a]		
≤130 pounds	18	1.3 (0.3−5.4)
131 to 150 pounds	32	1.6 (0.5−5.6)
151 to 170 pounds	27	1.8 (0.2−4.5)
171 to 190 pounds	22	1.6 (0.2−3.7)
≥191 pounds	29	1.5 (0.2−7.4)

[a] = Two missing values.
N = Number of subjects.

Source: Vitolins et al. (2002).

Table 11-23. Characteristics of the Feeding Infants and Toddlers Study (FITS) Sample Population

	Sample Size	Percentage of Sample
Sex		
Males	1,549	51.3
Females	1,473	48.7
Age of Child		
4 to 6 months	862	28.5
7 to 8 months	483	16.0
9 to 11 months	679	22.5
12 to 14 months	374	12.4
15 to 18 months	308	10.2
19 to 24 months	316	10.4
Child's Ethnicity		
Hispanic or Latino	367	12.1
Non-Hispanic or Latino	2,641	87.4
Missing	14	0.5
Child's Race		
White	2,417	80.0
Black	225	7.4
Other	380	12.6
Urbanicity		
Urban	1,389	46.0
Suburban	1,014	33.6
Rural	577	19.1
Missing	42	1.3
Household Income		
Under $10,000	48	1.6
$10,000 to $14,999	48	1.6
$15,000 to $24,999	221	7.3
$25,000 to $34,999	359	11.9
$35,000 to $49,999	723	23.9
$50,000 to $74,999	588	19.5
$75,000 to $99,999	311	10.3
$100,000 and Over	272	9.0
Missing	452	14.9
Receives WIC		
Yes	821	27.2
No	2,196	72.6
Missing	5	0.2
Sample Size (Unweighted)	3,022	100.0

WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Source: Devaney et al. (2004).

Table 11-24. Percentage of Infants and Toddlers Consuming Milk, Meat, or Other Protein Sources

Food Group/Food	Percentage of Infants and Toddlers Consuming at Least Once in a Day					
	4 to 6 months	7 to 8 months	9 to 11 months	12 to 14 months	15 to 18 months	19 to 24 months
Cow's Milk	0.8	2.9	20.3	84.8	88.3	87.7
Whole	0.5	2.4	15.1	68.8	71.1	58.8
Reduced-fat or Non-fat	0.3	0.5	5.3	17.7	20.7	38.1
Unflavored	0.8	2.9	19.5	84.0	87.0	86.5
Flavored	0.0	0.0	0.9	1.8	4.4	5.6
Soy Milk	0.0	0.5	1.7	1.5	3.9	3.8
Any Meat or Protein Source	14.2	54.9	79.2	91.3	92.7	97.2
Baby Food Meat	1.7	4.0	3.1	1.1	0.0	0.0
Non-baby Food Meat	1.5	8.4	33.7	60.3	76.3	83.7
Other Protein Sources	2.7	9.7	36.1	59.2	66.8	68.9
Dried Beans and Peas, Vegetarian Meat Substitutes	0.6	1.3	3.3	7.0	6.6	9.9
Eggs	0.7	2.9	7.3	17.0	25.0	25.2
Peanut Butter, Nuts, and Seeds	0.0	0.5	1.9	8.8	11.6	10.4
Cheese	0.4	2.1	18.5	34.0	39.1	41.1
Yogurt	1.2	4.1	15.7	14.9	20.2	15.3
Protein Sources in Mixed Dishes	11.0	43.3	46.2	30.1	25.5	20.5
Baby Food Dinners	9.5	39.8	33.5	10.2	2.4	1.3
Beans and Rice, Chili, Other Bean Mixtures	0.0	0.0	0.9	1.2	2.1	2.0
Mixtures with Vegetables and/or Rice/Pasta	0.9	1.2	4.7	8.2	9.0	7.8
Soup[a]	0.9	3.4	10.1	12.5	13.8	11.5
Types of Meat[b]						
Beef	0.9	2.6	7.7	16.1	16.3	19.3
Chicken or Turkey	2.0	7.3	22.4	33.0	46.9	47.3
Fish and Shellfish	0.0	0.5	1.9	5.5	8.7	7.1
Hotdogs, Sausages, and Cold cuts	0.0	2.1	7.1	16.4	20.1	27.0
Pork/Ham	0.3	1.7	4.0	9.7	11.2	13.9
Other	0.3	0.6	2.5	2.8	2.1	3.9

[a] The amount of protein actually provided by soups varies. Soups could not be sorted reliably into different food groups because all soups were assigned the same 2-digit food code and many food descriptions lacked detail about major soup ingredients.

[b] Includes baby food and non-baby food sources.

Source: Fox et al. (2004).

Table 11-25. Characteristics of WIC Participants and Non-Participants[a] (percentages)

	Infants 4 to 6 months		Infants 7 to 11 months		Toddlers 12 to 24 months	
	WIC Participant	Non-Participant	WIC Participant	Non-Participant	WIC Participant	Non-Participant
Sex						
Males	55	54	55	51	57	52
Females	45	46	45	49	43	48
		[b]		[b]		[b]
Child's Ethnicity						
Hispanic or Latino	20	11	24	8	22	10
Non-Hispanic or Latino	80	89	76	92	78	89
		[b]		[b]		[b]
Child's Race						
White	69	84	63	86	67	84
Black	15	4	17	5	13	5
Other	22	11	20	9	20	11
				[b]		[c]
Child In Daycare						
Yes	39	38	34	46	43	53
No	61	62	66	54	57	47
Age of Mother						
14 to 19 years	18	1	13	1	9	1
20 to 24 years	33	13	38	11	33	14
25 to 29 years	29	29	23	30	29	26
30 to 34 years	9	33	15	36	18	34
35 years or Older	9	23	11	21	11	26
Missing	2	2	1	1	0	1
		[b]		[b]		[b]
Mother's Education						
11th Grade or Less	23	2	15	2	17	3
Completed High School	35	19	42	20	42	19
Some Postsecondary	33	26	32	27	31	28
Completed College	7	53	9	51	9	48
Missing	2	1	2	0	1	2
		[b]		[b]		[b]
Parent's Marital Status						
Married	49	93	57	93	58	88
Not Married	50	7	42	7	41	11
Missing	1	1	1	0	1	1
				[c]		[c]
Mother or Female Guardian Work						
Yes	46	51	45	60	55	61
No	53	48	54	40	45	38
Missing	1	1	1	0	0	1
		[b]		[b]		[b]
Urbanicity						
Urban	34	55	37	50	35	48
Suburban	36	31	31	34	35	35
Rural	28	13	30	15	28	16
Missing	2	1	2	1	2	2
Sample Size (Unweighted)	265	597	351	808	205	791

[a] χ^2 test were conducted to test for statistical significance in the differences between WIC participants and non-participants within each age group for each variable. The results of χ^2 test are listed next to the variable under the column labeled non-participants for each of the three age groups.

[b] = $p>0.01$; non-participants significantly different from WIC participants on the variable.

[c] = $p<0.05$; non-participants significantly different from WIC participants on the variable.

WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Source: Ponza et al. (2004).

Table 11-26. Food Choices for Infants and Toddlers by WIC Participation Status

	Infants 4 to 6 months		Infants 7 to 11 months		Toddlers 12 to 24 months	
	WIC Participant	Non-Participant	WIC Participant	Non-Participant	WIC Participant	Non-Participant
Cow's Milk	1.0	0.6	11.4	13.2	92.3	85.8[a]
Meat or Other Protein Source						
Baby Food Meat	0.9	2.0	3.3	3.6	0.0	0.3
Non-baby Meat	3.7	0.5[b]	25.0	22.0	77.7	75.1
Eggs	0.9	0.6	8.5	4.2[b]	24.1	23.0
Peanut Butter, Nuts, Seeds	0.0	0.0	1.4	1.3	12.9	9.8
Cheese	0.0	0.6	9.0	12.5	38.5	38.8
Yogurt	0.8	1.4	5.5	13.3[b]	9.3	18.9[b]
Sample Size (unweighted)	265	597	351	808	205	791

[a] = $p<0.05$; non-participants significantly different from WIC participants.
[b] = $p<0.01$; non-participants significantly different from WIC participants.
WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Source: Ponza et al. (2004).

Table 11-27. Percentage of Hispanic and Non-Hispanic Infants and Toddlers Consuming Different Types of Milk, Meats, or Other Protein Sources on a Given Day

	Age 4 to 5 months		Age 6 to 11 months		Age 12 to 24 months	
	Hispanic (*N* = 84)	Non-Hispanic (*N* = 538)	Hispanic (*N* = 163)	Non-Hispanic (*N* = 1,228)	Hispanic (*N* = 124)	Non-Hispanic (*N* = 871)
Milk						
Fed Any Cow's or Goat Milk	-	-	7.5†	11.3	85.6	87.7
Fed Cow's Milk						
Whole	-	-	5.6†	8.3	61.7	66.3
Reduced Fat or Non-fat	-	-	2.2†	3.0	29.0	27.0
Meat or Other Protein Source						
Any Meat or Protein Source[a]	9.7†	5.3	71.6	62.0	90.3	94.7
Non-baby Food Meat	-	-	22.5	19.2	72.3	76.0
Other Protein Sources	1.4†	-	26.5	21.2	70.1	65.3
Beans and Peas	1.4†	-	5.8†	1.8	19.1[c]	6.5
Eggs	-	-	9.5	4.2	26.4	22.5
Cheese	-	-	11.2	9.4	29.3	40.2
Yogurt	-	-	7.7	9.8	15.7	17.0
Protein Sources in Mixed Dishes	7.5†	4.4	44.8	41.6	33.3	22.7
Baby Food dinners	6.9†	3.9	24.7[c]	35.3	3.5†	3.9
Soup[b]	-	-	16.3[d]	5.1	23.4[c]	10.7
Types of Meat[a]						
Beef	-	-	5.0†	4.6	25.2	16.0
Chicken and Turkey	-	-	11.2	11.9	46.5	43.6
Hotdogs, Sausages, and Cold Cuts	-	-	7.2†	3.4	14.8	23.3
Pork/Ham	-	-	3.8†	1.7	11.7	12.1

[a] Includes baby food and non-baby food sources.
[b] The amount of protein actually provided by soups varies. Soups could not be sorted reliably into different food groups because many food descriptions lacked detail about major soup ingredients.
[c] = Significantly different from non-Hispanic at $p<0.05$.
[d] = Significantly different from non-Hispanic at $p>0.01$.
- = Less than 1% of the group consumed this food on a given day.
† = Statistic is potentially unreliable because of a high coefficient of variation.
N = Sample size.

Source: Mennella et al. (2006).

Table 11-28. Average Portion Sizes per Eating Occasion of Meats and Dairy Products Commonly Consumed by Infants From the 2002 Feeding Infants and Toddlers Study

Food Group	Reference Unit	4 to 5 months (*N* = 624)	6 to 8 months (*N* = 708)	9 to 11 months (*N* = 687)
		Mean ± SE		
Non-baby food meats	ounce	-	0.9 ± 0.16	0.8 ± 0.05
Cheese	ounce	-	-	0.7 ± 0.05
Scrambled eggs	cup	-	-	0.2 ± 0.02
Yogurt	ounce	-	-	3.1 ± 0.20
Baby food dinners	ounce	2.9 ± 0.24	3.3 ± 0.09	3.8 ± 0.11

\- = Cell size was too small to generate a reliable estimate.
N = Number of respondents.
SE = Standard error of the mean.

Source: Fox et al. (2006).

Table 11-29. Average Portion Sizes per Eating Occasion of Meats and Dairy Products Commonly Consumed by Toddlers From the 2002 Feeding Infants and Toddlers Study

Food Group	Reference Unit	12 to 14 months (*N* = 371)	15 to 18 months (*N* = 312)	19 to 24 months (*N* = 320)
		Mean ± SE		
Milk				
Milk	fluid ounce	5.6± 0.14	5.9± 0.14	6.2± 0.17
Milk, as a beverage	fluid ounce	5.7± 0.14	6.1± 0.14	6.4± 0.17
Milk, on cereal	fluid ounce	3.4± 0.37	2.7± 0.26	3.6± 0.29
Meats and other protein source				
All meats	ounce	1.2± 0.06	1.3± 0.08	1.3± 0.07
Beef	ounce	0.8± 0.08	1.2± 0.15	1.2± 0.14
Chicken or turkey, plain	ounce	1.3± 0.10	1.3± 0.16	1.3± 0.10
Hot dogs, luncheon meats, sausages	ounce	1.3± 0.13	1.5± 0.13	1.5± 0.12
Chicken, breaded[a]	ounce	1.5 ± 0.14	1.5± 0.13	1.8± 0.12
	nugget	2.4 ± 0.22	2.4± 0.21	2.8± 0.19
Scrambled eggs	cup	0.2± 0.02	0.3± 0.03	0.3± 0.02
Peanut butter	tablespoon	0.7± 0.08	0.7± 0.09	0.9± 0.13
Yogurt	ounce	3.4± 0.19	3.8± 0.26	3.8± 0.28
Cheese	ounce	0.8± 0.05	0.8± 0.05	0.7± 0.04

[a] Not included in total for all meats because weight includes breading.
N = Number of respondents.
SE = Standard error of the mean.

Source: Fox et al. (2006).

Table 11-30. Per Capita Total Fat Intake (g/day)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
Birth to <1 year									
All	1,422	29	18	0	19	31	40	59	107
Females	728	28	17	0	18	30	39	57	92
Males	694	30	18	0	20	32	40	61	107
Birth to <1 month									
All	88	17	16	0	0	19	32	52	64
Females	50	19	15	0	0	18	29	39	52
Males	38	15	18	0	0	19	31	43	64
1 to <3 months									
All	245	22	18	0	0	27	34	47	75
Females	110	20	16	0	0	24	33	45	50
Males	135	23	19	0	0	28	34	55	75
3 to <6 months									
All	411	28	17	0.1	20	31	39	52	107
Females	223	27	17	0	16	29	38	51	74
Males	188	30	18	0.2	22	31	39	50	107
6 to <12 months									
All	678	33	17	8.5	25	34	43	62	100
Females	345	32	17	5.1	24	33	43	62	92
Males	333	34	16	11	25	34	44	62	100
1 to <2 years									
All	1,002	46	19	24	33	43	55	79	159
Females	499	45	18	25	33	43	54	77	116
Males	503	46	20	23	32	44	56	80	159
2 to <3 years									
All	994	51	21	27	37	48	60	87	197
Females	494	49	20	24	35	46	59	83	127
Males	500	52	21	29	39	50	61	89	197
3 to <6 years									
All	4,112	59	22	34	44	56	70	99	218
Females	2,018	56	21	33	43	54	68	96	194
Males	2,094	61	23	35	45	59	72	103	218
6 to <11 years									
All	1,553	68	24	41	50	66	81	111	179
Females	742	64	22	38	48	61	77	101	156
Males	811	72	25	43	55	70	86	115	179
11 to <16 years									
All	975	80	38	42	56	74	97	145	342
Females	493	69	29	37	49	65	82	123	259
Males	482	91	42	50	64	84	111	163	342

Table 11-30. Per Capita Total Fat Intake (g/day) (continued)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
16 to <21 years									
All	743	85	47	37	54	76	108	168	463
Females	372	79	39	35	49	75	96	154	317
Males	371	92	53	41	57	77	114	186	463
21 to <31 years									
All	1,412	84	45	36	53	76	104	164	445
Females	682	65	31	30	43	59	81	126	201
Males	730	103	48	50	68	93	125	181	445
31 to <41 years									
All	1,628	83	43	36	52	74	106	162	376
Females	781	64	31	29	42	58	79	121	228
Males	847	101	45	49	69	96	127	190	376
41 to <51 years									
All	1644	78	39	36	50	70	99	153	267
Females	816	63	29	31	43	59	78	114	208
Males	828	93	42	46	63	87	119	166	267
51 to <61 years									
All	1,578	73	37	31	46	66	90	137	306
Females	768	58	26	27	39	56	73	104	165
Males	810	88	40	39	57	82	110	156	306
61 to <71 years									
All	1,507	66	33	29	42	60	80	123	235
Females	719	53	24	26	36	49	68	96	184
Males	788	78	35	37	53	73	98	138	235
71 to <81 years									
All	888	60	27	28	41	55	72	104	201
Females	421	51	22	27	37	49	62	86	158
Males	467	68	29	34	48	67	86	114	201
81+ years									
All	392	57	29	24	36	54	69	102	227
Females	190	49	23	22	32	48	64	84	132
Males	202	64	32	31	43	61	82	106	227

[a] Age groups are based on U.S. EPA (2005) *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants.*

N = Sample size.

SE = Standard error.

Source: U.S. EPA (2007).

Table 11-31. Per Capita Total Fat Intake (g/kg-day)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
Birth to <1 year									
All	1,422	4.0	2.8	0	2.3	4.1	5.6	8.9	20
Females	728	4.1	2.8	0	2.4	4.3	5.8	8.7	18
Males	694	4.0	2.8	0	2.3	4.0	5.5	9.2	20
Birth to <1 month									
All	88	5.2	4.9	0	0	5.7	9.1	16	20
Females	50	5.9	4.6	0	0	6.2	8.4	13	16
Males	38	4.3	5.3	0	0	4.7	9.7	18	20
1 to <3 months									
All	245	4.5	3.8	0	0	4.9	6.8	12	18
Females	110	4.3	3.6	0	0	4.8	6.5	11	14
Males	135	4.7	3.9	0	0	4.9	7.0	10	18
3 to <6 months									
All	411	4.1	2.7	0	2.4	4.3	5.7	8.2	18
Females	223	4.2	2.8	0	2.3	4.5	6.0	8.2	18
Males	188	4.1	2.5	0	2.6	4.1	5.5	8.2	16
6 to <12 months									
All	678	3.7	1.8	1.0	2.7	3.8	4.8	7.0	11
Females	345	3.7	1.9	0.7	2.8	3.8	5.0	7.0	9.8
Males	333	3.6	1.7	1.3	2.6	3.7	4.6	6.8	11
1 to <2 years									
All	1,002	4.0	1.7	2.1	2.8	3.7	4.7	7.1	12
Females	499	4.1	1.6	2.2	3.0	3.7	5.0	6.9	9.7
Males	503	3.9	1.7	1.9	2.6	3.6	4.5	7.2	12
2 to <3 years									
All	994	3.6	1.5	1.9	2.6	3.4	4.4	6.4	12
Females	494	3.7	1.6	1.8	2.4	3.4	4.4	6.6	10
Males	500	3.6	1.5	2.0	2.6	3.4	4.3	6.1	12
3 to <6 years									
All	4,112	3.4	1.3	1.9	2.4	3.2	4.0	5.8	11
Females	2,018	3.4	1.3	1.8	2.4	3.1	4.0	5.8	11
Males	2,094	3.5	1.4	1.9	2.4	3.2	4.1	5.8	11
6 to <11 years									
All	1,553	2.6	1.1	1.3	1.7	2.3	3.0	4.2	9.9
Females	742	2.4	1.0	1.3	1.6	2.2	2.8	4.0	7.7
Males	811	2.7	1.1	1.4	1.8	2.4	3.1	4.4	9.9
11 to <16 years									
All	975	1.6	0.8	0.8	1.1	1.4	2.0	3.0	5.7
Females	493	1.4	0.7	0.7	0.9	1.3	1.7	2.6	5.0
Males	482	1.8	0.9	0.9	1.2	1.6	2.1	3.3	5.7

Table 11-31. Per Capita Total Fat Intake (g/kg-day) (continued)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
16 to <21 years									
All	743	1.3	0.66	0.54	0.81	1.2	1.6	2.7	6.0
Females	372	1.1	0.56	0.48	0.75	1.1	1.4	2.1	4.4
Males	371	1.4	0.73	0.63	0.85	1.2	1.7	2.9	6.0
21 to <31 years									
All	1,412	1.2	0.61	0.53	0.72	1.1	1.5	2.3	7.3
Females	682	1.0	0.52	0.44	0.65	0.9	1.3	2.0	3.7
Males	730	1.3	0.66	0.63	0.85	1.2	1.6	2.4	7.3
31 to <41 years									
All	1,628	1.1	0.55	0.49	0.69	1.0	1.4	2.1	4.7
Females	781	1.0	0.52	0.45	0.61	0.9	1.3	1.9	4.7
Males	847	1.2	0.54	0.59	0.85	1.2	1.5	2.3	4.3
41 to <51 years									
All	1,644	1.0	0.49	0.48	0.66	0.9	1.3	1.9	4.4
Females	816	0.9	0.43	0.43	0.61	0.9	1.2	1.7	2.9
Males	828	1.1	0.53	0.53	0.72	1.0	1.4	2.0	4.4
51 to <61 years									
All	1,578	0.9	0.46	0.42	0.61	0.86	1.2	1.7	3.8
Females	768	0.8	0.38	0.39	0.56	0.79	1.1	1.5	2.4
Males	810	1.0	0.50	0.47	0.65	0.95	1.3	1.9	3.8
61 to <71 years									
All	1,507	0.9	0.43	0.40	0.55	0.79	1.1	1.7	3.2
Females	719	0.8	0.39	0.36	0.50	0.74	1.0	1.5	3.2
Males	788	1.0	0.45	0.46	0.61	0.87	1.2	1.8	3.1
71 to <81 years									
All	888	0.8	0.37	0.40	0.56	0.78	1.0	1.5	3.2
Females	421	0.8	0.37	0.39	0.53	0.72	1.0	1.4	3.2
Males	467	0.9	0.37	0.42	0.61	0.82	1.1	1.5	2.6
81+ years									
All	392	0.9	0.43	0.37	0.56	0.82	1.1	1.5	3.7
Females	190	0.8	0.39	0.35	0.54	0.82	1.1	1.5	2.1
Males	202	0.9	0.47	0.39	0.56	0.82	1.1	1.6	3.7

[a] Age groups are based on U.S. EPA (2005) *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants.*

N = Sample size.

SE = Standard error.

Source: U.S. EPA (2007).

Table 11-32. Consumer-Only Total Fat Intake (g/day)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
Birth to <1 year									
All	1,301	31	16	7.0	24	32	41	61	107
Females	664	30	16	5.1	24	32	40	58	92
Males	637	32	16	9.0	25	33	41	62	107
Birth to <1 month									
All	59	26	13	6.7	17	27	32	52	64
Females	37	26	11	7.8	17	25	32	39	52
Males	22	25	17	-	-	-	-	-	64
1 to <3 months									
All	182	29	14	5.8	24	31	35	53	75
Females	79	28	12	4.3	21	30	35	46	50
Males	103	31	16	8.5	27	31	38	59	75
3 to <6 months									
All	384	30	16	2.5	24	32	40	54	107
Females	205	29	16	1.2	24	31	39	52	72
Males	179	31	17	4.6	25	33	39	53	107
6 to <12 months									
All	676	33	16	8.9	25	34	43	62	100
Females	343	32	17	6.2	24	34	43	62	92
Males	333	34	16	11	25	34	44	62	100
1 to <2 year									
All	1,002	46	19	24	33	43	55	79	159
Females	499	45	18	25	33	43	54	77	116
Males	503	46	20	23	32	44	56	80	159
2 to <3 years									
All	994	51	21	27	37	48	60	87	197
Females	494	49	20	24	35	46	59	83	127
Males	500	52	21	29	39	50	61	89	197
3 to <6 years									
All	4,112	59	22	34	44	56	70	99	218
Females	2,018	56	21	33	43	54	68	96	194
Males	2,094	61	23	35	45	59	72	103	218
6 to <11 years									
All	1,553	68	24	41	50	66	81	111	179
Females	742	64	22	38	48	61	77	101	156
Males	811	72	25	43	55	70	86	115	179
11 to <16 years									
All	975	80	38	42	56	74	97	145	342
Females	493	69	29	37	49	65	82	123	259
Males	482	91	42	50	64	84	111	163	342

Table 11-32. Consumer-Only Total Fat Intake (g/day) (continued)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
16 to <21 years									
All	743	85	47	37	54	76	108	168	463
Females	372	79	39	35	49	75	96	154	317
Males	371	92	53	41	57	77	114	186	463
21 to <31 years									
All	1,412	84	45	36	53	76	104	164	445
Females	682	65	31	30	43	59	81	126	201
Males	730	103	48	50	68	93	125	181	445
31 to <41 years									
All	1,628	83	43	36	52	74	106	162	376
Females	781	64	31	29	42	58	79	121	228
Males	847	101	45	49	69	96	127	190	376
41 to <51 years									
All	1,644	78	39	36	50	70	99	153	267
Females	816	63	29	31	43	59	78	114	208
Males	828	93	42	46	63	87	119	166	267
51 to <61 years									
All	1,578	73	37	31	46	66	90	137	306
Females	768	58	26	27	39	56	73	104	165
Males	810	88	40	39	57	82	110	156	306
61 to <71 years									
All	1,507	66	33	29	42	60	80	123	235
Females	719	53	24	26	36	49	68	96	184
Males	788	78	35	37	53	73	98	138	235
71 to <81 years									
All	888	60	27	28	41	55	72	104	201
Females	421	51	22	27	37	49	62	86	158
Males	467	68	29	34	48	67	86	114	201
81+ years									
All	392	57	29	24	36	54	69	102	227
Females	190	49	23	22	32	48	64	84	132
Males	202	64	32	31	43	61	82	106	227

[a] Age groups are based on U.S. EPA (2005) *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants*.
- = Percentiles were not calculated for sample sizes less than 30.
N = Sample size.
SE = Standard error.

Source: U.S. EPA (2007).

Table 11-33. Consumer-Only Total Fat Intake (g/kg-day)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
Birth to <1 year									
All	1,301	4.4	2.6	0.94	2.9	4.3	5.8	9.2	20
Females	664	4.5	2.6	0.67	3.1	4.5	6.0	8.9	18
Males	637	4.3	2.6	1.2	2.8	4.1	5.6	9.3	20
Birth to <1 month									
All	59	7.8	4.1	1.4	5.4	8.0	9.7	16	20
Females	37	8.0	3.5	2.0	5.3	7.7	9.1	13	16
Males	22	7.4	4.9	-	-	-	-	-	20
1 to <3 months									
All	182	6.0	3.1	1.0	4.1	6.0	7.8	12	18
Females	79	5.9	2.9	0.80	4.3	6.0	7.7	12	14
Males	103	6.1	3.3	1.8	4.1	6.0	7.8	12	18
3 to <6 months									
All	384	4.4	2.5	0.35	3.1	4.5	5.8	8.3	18
Females	205	4.5	2.6	0.14	3.1	4.7	6.1	8.2	18
Males	179	4.3	2.4	0.57	3.1	4.2	5.6	8.8	16
6 to <12 months									
All	676	3.7	1.8	1.0	2.7	3.8	4.8	7.0	11
Females	343	3.7	1.9	0.75	2.8	3.8	5.0	7.0	9.8
Males	333	3.6	1.7	1.3	2.6	3.7	4.6	6.8	11
1 to <2 years									
All	1,002	4.0	1.7	2.1	2.8	3.7	4.7	7.1	12
Females	499	4.1	1.6	2.2	3.0	3.7	5.0	6.9	9.7
Males	503	3.9	1.7	1.9	2.6	3.6	4.5	7.2	12
2 to <3 years									
All	994	3.6	1.5	1.9	2.6	3.4	4.4	6.4	12
Females	494	3.7	1.6	1.8	2.4	3.4	4.4	6.6	10
Males	500	3.6	1.5	2.0	2.6	3.4	4.3	6.1	12
3 to <6 years									
All	4,112	3.4	1.3	1.9	2.4	3.2	4.0	5.8	11
Females	2,018	3.4	1.3	1.8	2.4	3.1	4.0	5.8	11
Males	2,094	3.5	1.4	1.9	2.4	3.2	4.1	5.8	11
6 to <11 years									
All	1,553	2.6	1.1	1.3	1.7	2.3	3.0	4.2	9.9
Females	742	2.4	1.0	1.3	1.6	2.2	2.8	4.0	7.7
Males	811	2.7	1.1	1.4	1.8	2.4	3.1	4.4	9.9
11 to <16 years									
All	975	1.6	0.80	0.77	1.1	1.4	2.0	3.0	5.7
Females	493	1.4	0.69	0.67	0.91	1.3	1.7	2.6	5.0
Males	482	1.8	0.86	0.88	1.2	1.6	2.1	3.3	5.7

Table 11-33 Consumer-Only Total Fat Intake (g/kg-day) (continued)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
16 to <21 years									
All	743	1.3	0.66	0.54	0.81	1.2	1.6	2.7	6.0
Females	372	1.1	0.56	0.48	0.75	1.1	1.4	2.1	4.4
Males	371	1.4	0.73	0.63	0.85	1.2	1.7	2.9	6.0
21 to <31 years									
All	1,412	1.2	0.61	0.53	0.72	1.1	1.5	2.3	7.3
Females	682	1.0	0.52	0.44	0.65	0.93	1.3	2.0	3.7
Males	730	1.3	0.66	0.63	0.85	1.2	1.6	2.4	7.3
31 to <41 years									
All	1,628	1.1	0.55	0.49	0.69	1.0	1.4	2.1	4.7
Females	781	0.98	0.52	0.45	0.61	0.91	1.3	1.9	4.7
Males	847	1.2	0.54	0.59	0.85	1.2	1.5	2.3	4.3
41 to <51 years									
All	1,644	1.0	0.49	0.48	0.66	0.94	1.3	1.9	4.4
Females	816	0.92	0.43	0.43	0.61	0.86	1.2	1.7	2.9
Males	828	1.1	0.53	0.53	0.72	1.0	1.4	2.0	4.4
51 to <61 years									
All	1,578	0.94	0.46	0.42	0.61	0.86	1.2	1.7	3.8
Females	768	0.83	0.38	0.39	0.56	0.79	1.1	1.5	2.4
Males	810	1.0	0.50	0.47	0.65	0.95	1.3	1.9	3.8
61 to <71 years									
All	1,507	0.88	0.43	0.40	0.55	0.79	1.1	1.7	3.2
Females	719	0.79	0.39	0.36	0.50	0.74	0.99	1.5	3.2
Males	788	0.95	0.45	0.46	0.61	0.87	1.2	1.8	3.1
71 to <81 years									
All	888	0.82	0.37	0.40	0.56	0.78	1.0	1.5	3.2
Females	421	0.77	0.37	0.39	0.53	0.72	0.95	1.4	3.2
Males	467	0.87	0.37	0.42	0.61	0.82	1.1	1.5	2.6
81+ years									
All	392	0.86	0.43	0.37	0.56	0.82	1.1	1.5	3.7
Females	190	0.83	0.39	0.35	0.54	0.82	1.1	1.5	2.1
Males	202	0.89	0.47	0.39	0.56	0.82	1.1	1.6	3.7

[a] Age groups are based on U.S. EPA (2005) *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants.*

\- = Percentiles were not calculated for sample sizes less than 30.

N = Sample size.

SE = Standard error.

Source: U.S. EPA (2007).

Table 11-34. Consumer-Only Total Fat Intake—Top 10% of Animal Fat Consumers (g/day)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
Birth to <1 year									
All	140	45	16	28	35	45	54	77	100
Females	70	45	15	26	35	45	54	69	92
Males	70	45	17	28	34	44	53	79	100
1 to <2 years									
All	109	75	20	52	61	74	85	108	159
Females	54	68	16	52	57	70	78	89	114
Males	55	81	22	54	67	78	90	125	159
2 to <3 years									
All	103	79	20	55	64	74	85	116	133
Females	58	77	16	55	65	74	79	109	116
Males	45	81	24	52	61	73	90	121	133
3 to <6 years									
All	461	88	25	62	72	84	102	135	218
Females	217	84	24	59	68	80	95	130	194
Males	244	92	25	66	76	90	103	136	218
6 to <11 years									
All	198	94	25	66	77	88	105	140	178
Females	71	88	21	58	70	86	100	123	156
Males	127	97	27	69	78	91	112	168	178
11 to <16 years									
All	96	133	53	85	95	121	154	223	342
16 to <21 years									
All	68	167	64	98	122	154	189	278	463
11 to <21 years									
All	165	146	60	90	105	139	168	254	463
Females	53	117	30	81	92	111	140	162	195
Males	112	160	65	94	117	151	191	276	463
21 to <31 years									
All	150	151	55	97	113	139	173	236	445
Females	44	115	31	80	97	108	131	160	201
Males	106	166	56	107	128	161	177	254	445
31 to <41 years									
All	148	147	51	93	110	135	172	352	376
Females	48	120	33	79	93	106	132	160	228
Males	100	160	53	110	125	149	201	352	376
41 to <51 years									
All	166	137	42	88	110	136	156	208	267
Females	49	110	30	72	86	103	130	150	208
Males	117	148	41	106	119	142	166	218	267

Table 11-34. Consumer-Only Total Fat Intake—Top 10% of Animal Fat Consumers (g/day) (continued)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
51 to <61 years									
All	183	127	41	80	98	118	144	206	306
Females	39	96	27	63	74	86	106	126	165
Males	144	135	41	96	112	122	151	214	306
61 to <71 years									
All	168	114	35	74	88	108	133	183	235
Females	47	91	24	68	74	87	103	120	184
Males	121	123	35	87	102	117	140	197	235
71 to <81 years									
All	104	98	28	65	76	92	109	144	201
81+ years									
All	40	97	37	60	67	86	104	137	227
71+ years									
All	144	98	30	62	72	91	107	144	227
Females	50	83	25	54	63	72	95	123	147
Males	94	105	30	76	88	97	115	165	227

[a] Age groups are based on U.S. EPA (2005) *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants*.

N = Sample size.

SE = Standard error.

Source: U.S. EPA (2007).

Table 11-35. Consumer-Only Total Fat Intake—Top 10% of Animal Fat Consumers (g/kg-day)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
Birth to <1 year									
All	140	4.7	1.7	2.8	3.7	4.6	6.0	7.7	11
Females	70	4.8	1.6	2.7	3.7	4.7	6.0	7.7	9.5
Males	70	4.6	1.7	2.8	3.6	4.4	5.8	7.5	11
1 to <2 years									
All	109	6.9	1.5	5.1	5.7	6.8	7.7	9.5	12
Females	54	6.6	1.2	5.1	5.7	6.7	7.4	9.3	9.7
Males	55	7.1	1.6	5.1	5.8	6.9	8.0	9.4	12
2 to <3 years									
All	103	6.1	1.3	4.6	5.2	5.8	6.7	8.3	9.5
Females	58	6.2	1.2	4.6	5.2	5.9	6.8	7.9	9.5
Males	45	6.1	1.3	4.5	5.2	5.6	6.6	8.4	9.5
3 to <6 years									
All	461	5.6	1.3	4.2	4.7	5.3	6.2	8.3	11
Females	217	5.5	1.3	4.2	4.5	5.3	6.0	7.8	11
Males	244	5.7	1.3	4.2	4.8	5.3	6.2	8.4	11
6 to <11 years									
All	198	4.2	1.1	3.0	3.4	3.8	4.6	6.0	9.9
Females	71	4.2	1.1	2.9	3.3	3.8	4.8	5.8	7.7
Males	127	4.2	1.1	3.0	3.4	3.8	4.5	6.3	9.9
11 to <16 years									
All	96	3.0	0.85	2.0	2.4	2.8	3.3	4.6	5.7
16 to <21 years									
All	68	2.5	0.74	1.7	2.0	2.4	2.9	3.7	6.0
11 to <21 years									
All	165	2.8	0.84	1.9	2.1	2.7	3.1	4.4	6.0
Females	53	2.6	0.65	1.7	2.0	2.3	2.7	3.4	4.6
Males	112	2.9	0.90	1.9	2.3	2.8	3.1	4.5	6.0
21 to <31 years									
All	150	2.2	0.73	1.5	1.7	2.1	2.4	3.2	7.3
Females	44	2.0	0.54	1.5	1.8	1.9	2.3	3.1	3.7
Males	106	2.2	0.79	1.6	1.7	2.1	2.4	3.2	7.3
31 to <41 years									
All	148	2.1	0.59	1.5	1.7	1.9	2.4	3.9	4.7
Females	48	2.1	0.62	1.5	1.7	1.9	2.2	2.8	4.7
Males	100	2.1	0.58	1.5	1.6	2.0	2.6	3.9	4.3
41 to <51 years									
All	166	1.8	0.49	1.3	1.5	1.8	2.1	2.8	4.0
Females	49	1.8	0.45	1.3	1.4	1.8	2.1	2.6	2.9
Males	117	1.9	0.50	1.4	1.6	1.8	2.0	2.8	4.0

Table 11-35. Consumer-Only Total Fat Intake—Top 10% of Animal Fat Consumers (g/kg-day)(continued)

Age Group[a]	*N*	Mean	SE	Percentiles					
				10th	25th	50th	75th	95th	Max
51 to <61 years									
All	183	1.7	0.46	1.2	1.3	1.6	1.9	2.5	3.8
Females	39	1.5	0.34	1.1	1.3	1.4	1.7	2.0	2.4
Males	144	1.7	0.48	1.2	1.4	1.6	1.9	2.6	3.8
61 to <71 years									
All	168	1.6	0.42	1.2	1.3	1.5	1.8	2.5	3.2
Females	47	1.6	0.42	1.1	1.3	1.5	1.7	2.3	3.2
Males	121	1.6	0.43	1.2	1.3	1.5	1.8	2.5	3.1
71 to <81 years									
All	104	1.4	0.37	1.0	1.1	1.3	1.5	2.0	3.2
81+ years									
All	40	1.6	0.48	1.1	1.2	1.4	1.7	2.0	3.7
71+ years									
All	144	1.4	0.41	1.0	1.1	1.3	1.6	2.0	3.7
Females	50	1.4	0.41	0.96	1.1	1.4	1.6	1.8	3.2
Males	94	1.5	0.41	1.1	1.2	1.3	1.5	2.1	3.7

[a] Age groups are based on U.S. EPA (2005) *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants*.
N = Sample size
SE = Standard error.

Source: U.S. EPA (2007).

Table 11-36. Fat Intake Among Children Based on Data From the Bogalusa Heart Study, 1973−1982 (g/day)

Age	*N*	Mean	SD	Percentiles					Minimum	Maximum
				10th	25th	50th	75th	90th		
Total Fat Intake										
6 months	125	37.1	17.5	18.7	25.6	33.9	46.3	60.8	3.4	107.6
1 year	99	59.1	26.0	29.1	40.4	56.1	71.4	94.4	21.6	152.7
2 years	135	86.7	41.3	39.9	55.5	79.2	110.5	141.1	26.5	236.4
3 years	106	91.6	38.8	50.2	63.6	82.6	114.6	153.0	32.6	232.5
4 years	219	98.6	56.1	46.0	66.8	87.0	114.6	163.3	29.3	584.6
10 years	871	93.2	50.8	45.7	60.5	81.4	111.3	154.5	14.6	529.5
13 years	148	107.0	53.9	53.0	69.8	90.8	130.7	184.1	9.8	282.2
15 years	108	97.7	48.7	46.1	65.2	85.8	124.0	165.2	10.0	251.3
17 years	159	107.8	64.3	41.4	59.7	97.3	140.2	195.1	8.5	327.4
Total Animal Fat										
6 months	125	18.4	16.0	0.7	4.2	13.9	28.4	42.5	0.0	61.1
1 year	99	36.5	20.0	15.2	23.1	33.0	45.9	65.3	0.0	127.1
2 years	135	49.5	28.3	20.1	28.9	42.1	66.0	81.4	10.0	153.4
3 years	106	50.1	29.4	21.3	29.1	42.9	64.4	88.9	14.1	182.6
4 years	219	50.8	31.7	21.4	28.1	42.6	66.4	92.6	5.9	242.2
10 years	871	54.1	39.6	20.3	30.6	45.0	64.6	97.5	0.0	412.3
13 years	148	56.2	39.8	19.8	28.5	44.8	72.8	109.4	4.7	209.6
15 years	108	53.8	35.1	15.9	28.3	44.7	67.9	105.8	0.6	182.1
17 years	159	64.4	48.5	15.2	30.7	51.6	86.6	128.8	2.6	230.3
Total Vegetable Fat Intake										
6 months	125	9.2	12.8	0.6	1.2	2.8	11.6	29.4	0.0	53.2
1 year	99	15.4	14.3	3.7	6.1	11.3	18.1	38.0	0.2	70.2
2 years	135	19.3	16.3	3.8	7.9	14.8	26.6	42.9	0.7	96.6
3 years	106	21.1	15.5	3.9	8.6	18.7	26.6	45.2	1.0	70.4
4 years	219	24.5	18.6	5.7	10.4	21.8	33.3	48.5	0.9	109.0
10 years	871	23.7	21.6	4.3	9.5	18.3	30.6	49.0	0.6	203.7
13 years	148	34.3	27.4	8.4	17.9	31.2	44.6	57.5	0.0	238.3
15 years	108	27.3	22.8	5.1	11.9	22.6	38.1	54.4	0.7	132.2
17 years	159	25.7	21.3	4.2	11.7	20.8	32.9	47.6	0.0	141.5
Total Fish Fat Intake										
6 months	125	0.05	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.9
1 year	99	0.05	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.9
2 years	135	0.04	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.9
3 years	106	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	4.5
4 years	219	2.3	31.1	0.0	0.0	0.0	0.0	0.0	0.0	459.2
10 years	871	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	19.2
13 years	148	0.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0	25.4
15 years	108	0.4	1.5	0.0	0.0	0.0	0.0	1.5	0.0	9.5
17 years	159	0.5	2.0	0.0	0.0	0.0	0.0	0.4	0.0	15.3

N = Sample size.
SD = Standard deviation.
Source: Frank et al. (1986).

Table 11-37. Fat Intake Among Children Based on Data From the Bogalusa Heart Study, 1973−1982 (g/kg-day)

Age	*N*	Mean	SD	Percentiles					Minimum	Maximum
				10th	25th	50th	75th	90th		
Total Fat Intake										
6 months	125	4.9	2.3	2.4	3.3	4.7	6.2	8.0	0.4	13.2
1 year	99	6.1	2.8	3.0	4.1	5.7	7.5	9.5	2.3	16.4
2 years	132	7.0	3.3	3.4	4.5	6.2	8.6	11.9	2.1	18.7
3 years	106	6.4	2.7	3.6	4.6	5.5	8.2	9.9	2.2	16.7
4 years	218	6.1	3.7	2.9	4.0	5.2	7.0	10.0	2.0	38.2
10 years	861	2.7	1.5	1.2	1.7	2.4	3.3	4.5	0.3	13.9
13 years	147	2.3	1.3	1.0	1.5	2.0	2.8	3.8	0.2	10.2
15 years	105	1.7	0.8	0.8	1.2	1.5	2.1	3.1	0.2	4.7
17 years	149	1.8	1.0	0.7	0.9	1.6	2.2	3.1	0.2	6.2
Total Animal Fat										
6 months	125	2.4	2.1	0.08	0.6	2.0	3.7	5.5	0.0	9.0
1 year	99	3.8	2.1	1.7	2.4	3.4	4.9	6.5	0.0	13.6
2 years	132	4.0	2.3	1.7	2.3	3.4	5.2	6.7	0.7	13.4
3 years	106	3.5	2.0	1.6	2.1	3.1	4.2	6.1	0.9	13.1
4 years	218	3.1	2.1	1.3	1.7	2.6	4.0	5.4	0.4	15.4
10 years	861	16	1.2	0.6	0.8	1.3	1.9	2.8	0.00	10.8
13 years	147	1.2	0.9	0.4	0.6	0.9	1.6	2.3	0.08	5.2
15 years	105	1.0	0.6	0.3	0.5	0.8	1.3	1.9	0.01	3.1
17 years	149	1.0	0.8	0.3	0.5	0.8	1.4	2.0	0.05	4.2
Total Vegetable Fat Intake										
6 months	125	1.2	1.8	0.08	0.2	0.4	1.6	4.1	0.0	8.2
1 year	99	1.6	1.6	0.4	0.6	1.2	1.9	3.8	0.02	7.6
2 years	132	1.6	1.4	0.3	0.7	1.1	2.0	3.5	0.06	8.5
3 years	106	1.5	1.1	0.3	0.6	1.4	2.0	3.0	0.08	5.1
4 years	218	1.5	1.2	0.4	0.6	1.2	2.1	2.8	0.06	7.3
10 years	861	0.7	0.6	0.1	0.3	0.5	0.9	1.4	0.02	4.2
13 years	147	0.8	0.8	0.2	0.4	0.6	0.9	1.3	0.0	8.6
15 years	105	0.5	0.4	0.09	0.2	0.4	0.7	0.9	0.01	2.2
17 years	149	0.4	0.4	0.07	0.2	0.4	0.6	0.9	0.0	2.1
Total Fish Fat Intake										
6 months	125	0.01	0.02	0.0	0.0	0.0	0.0	0.02	0.0	0.1
1 year	99	0.01	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.2
2 years	132	0.003	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.2
3 years	106	0.01	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.3
4 years	218	0.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0
10 years	861	0.01	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.6
13 years	147	0.01	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.4
15 years	105	0.01	0.03	0.0	0.0	0.0	0.0	0.04	0.0	0.2
17 years	149	0.01	0.03	0.0	0.0	0.0	0.0	0.008	0.0	0.2

N = Sample size.
SD = Standard deviation.
Source: Frank et al. (1986).

Table 11-38. Mean Percent Moisture and Total Fat Content of Selected Meat and Dairy Products[a]

Product	Moisture Content (%)	Total Fat Content (%)	Comment
	Meat		
Beef (composite of trimmed retail cuts; all grades)	70.62	6.16	Raw; lean only
	59.25	9.91	Cooked; lean only
	60.44	19.24	Raw; lean and fat, 1/4 in fat trim
	51.43	21.54	Cooked; lean and fat, 1/4 in fat trim
Pork (composite of trimmed retail cuts)	72.34	5.88	Raw; lean only
	60.31	9.66	Cooked; lean only
	65.11	14.95	Raw; lean and fat
	54.55	17.18	Cooked; lean and fat
Cured ham	63.46	12.90	Center slice, unheated; lean and fat
	55.93	8.32	Raw, center slice, country style; lean only
Cured bacon	40.20	45.04	Raw
	12.52	43.27	Cooked, baked
	12.32	41.78	Cooked, broiled
	12.12	40.30	Cooked, pan-fried
	16.49	37.27	Cooked, microwaved
Lamb (composite of trimmed retail cuts)	73.42	5.25	Raw; lean only
	61.96	9.52	Cooked; lean only
	60.70	21.59	Raw; lean and fat, 1/4 in fat trim
	53.72	20.94	Cooked; lean and fat, 1/4 in fat trim
Veal (composite of trimmed retail cuts)	75.91	2.87	Raw; lean only
	60.16	6.58	Cooked; lean only
	72.84	6.77	Raw; lean and fat, 1/4 in fat trim
	57.08	11.39	Cooked; lean and fat, 1/4 in fat trim
Rabbit (domesticated)	72.82	5.55	Raw
	60.61	8.05	Cooked, roasted
	58.82	8.41	Cooked, stewed
Chicken (broilers or fryers)	75.46	3.08	Raw; meat only
	66.81	6.71	Cooked, stewed; meat only
	63.79	7.41	Cooked, roasted; meat only
	57.53	9.12	Cooked, fried; meat only
	65.99	15.06	Raw; meat and skin
	63.93	12.56	Cooked, stewed; meat and skin
	59.45	13.60	Cooked, roasted; meat and skin
	52.41	14.92	Cooked, fried, flour; meat and skin
Duck (domesticated)	73.77	5.95	Raw; meat only
	64.22	11.20	Cooked, roasted; meat only
	48.50	39.34	Raw; meat and skin
	51.84	28.35	Cooked, roasted; meat and skin
Turkey (all classes)	74.16	2.86	Raw; meat only
	64.88	4.97	Cooked, roasted; meat only
	70.40	8.02	Raw; meat and skin
	61.70	9.73	Cooked, roasted; meat and skin
	71.97	8.26	Raw; ground
	59.42	13.15	Cooked; ground

Table 11-38. Mean Percent Moisture and Total Fat Content of Selected Meat and Dairy Products[a] (continued)

Product		Moisture Content (%)	Total Fat Content (%)	Comment
Dairy				
Milk				
	Whole	88.32	3.25	3.25% milkfat
	Human	87.50	4.38	Whole, mature, fluid
	Lowfat (1%)	89.81	0.97	Fluid, with added non-fat milk solids and vitamin A
	Reduced fat (2%)	88.86	1.92	Fluid, with added non-fat milk solids and vitamin A
	Skim or fat free	90.38	0.25	Fluid, with added non-fat milk solids and vitamin A
Cream				
	Half and half	80.57	11.50	Fluid
	Light (coffee cream or table cream)	73.75	19.31	Fluid
	Heavy-whipping	57.71	37.00	Fluid
	Sour	70.95	20.96	Cultured
	Sour, reduced fat	80.14	12.00	Cultured
Butter		15.87	81.11	Salted
Cheese				
	American	39.16	31.25	Pasteurized
	Cheddar	36.75	33.14	
	Swiss	37.12	27.80	
	Cream	53.75	34.87	
	Parmesan	29.16; 20.84	25.83; 28.61	Hard; grated
	Cottage, lowfat	82.48; 79.31	1.02; 1.93	1% fat; 2% fat
	Colby	38.20	32.11	
	Blue	42.41	28.74	
	Provolone	40.95	26.62	
	Mozzarella	50.01; 53.78	22.35; 15.92	Whole milk; Skim milk
Yogurt		85.07; 87.90	1.55; 3.25	Plain, lowfat; Plain, with fat
Egg		75.84	9.94	Chicken, whole raw, fresh

[a] Based on the water and lipid content in 100 grams, edible portion. Total Fat Content = saturated, monosaturated, and polyunsaturated. For additional information, consult the USDA nutrient database.

Source: USDA (2007).

12. INTAKE OF GRAIN PRODUCTS

12.1. INTRODUCTION

The American food supply is generally considered to be one of the safest in the world. Nevertheless, grain products may become contaminated with toxic chemicals by several different pathways. Ambient air pollutants may be deposited on or absorbed by the plants, or dissolved in rainfall or irrigation waters that contact the plants. Pollutants may also be absorbed through plant roots from contaminated soil and ground water. The addition of pesticides, soil additives, and fertilizers may also result in contamination of grain products. To assess exposure through this pathway, information on ingestion rates of grain products is needed.

A variety of terms may be used to define intake of grain products (e.g., consumer-only intake, per capita intake, total grain intake, as-consumed intake, uncooked edible intake, dry-weight intake). As described in Chapter 9 (Intake of Fruits and Vegetables), consumer-only intake is defined as the quantity of grain products consumed by individuals during the survey period. These data are generated by averaging intake across only the individuals in the survey who consumed these food items. Per capita intake rates are generated by averaging consumer-only intakes over the entire population (including those that reported no intake). In general, per capita intake rates are appropriate for use in exposure assessments for which average dose estimates for individuals are of interest because they represent both individuals who ate the foods during the survey period and those who may eat the food items at some time but did not consume them during the survey period. Per capita intake, therefore, represents an average across the entire population of interest, but does so at the expense of underestimating consumption for the subset of the population that consumed the food in question. Total grain intake refers to the sum of all grain products consumed in a day.

Intake rates may be expressed on the basis of the as-consumed weight (e.g., cooked or prepared) or on the uncooked or unprepared weight. As-consumed intake rates are based on the weight of the food in the form that it is consumed and should be used in assessments where the basis for the contaminant concentrations in foods is also indexed to the as-consumed weight. Some of the food ingestion values provided in this chapter are expressed as as-consumed intake rates because this is the fashion in which data were reported by survey respondents. Others are provided as uncooked weights based on analyses of survey data that account for weight changes that occur during cooking. This is of importance because concentration data to be used in the dose equation are often measured in uncooked food samples. It should be recognized that cooking can either increase or decrease food weight. Similarly, cooking can increase the mass of contaminant in food (due to formation reactions, or absorption from cooking oils or water) or decrease the mass of contaminant in food (due to vaporization, fat loss, or leaching). The combined effects of changes in weight and changes in contaminant mass can result in either an increase or decrease in contaminant concentration in cooked food. Therefore, if the as-consumed ingestion rate and the uncooked concentration are used in the dose equation, dose may be under-estimated or over-estimated. It is important for the assessor to be aware of these issues and choose intake rate data that best match the concentration data that are being used. For more information on cooking losses and conversions necessary to account for such losses, refer to Chapter 13 of this handbook.

Sometimes contaminant concentrations in food are reported on a dry-weight basis. When these data are used in an exposure assessment, it is recommended that dry-weight intake rates also be used. Dry-weight food concentrations and intake rates are based on the weight of the food consumed after the moisture content has been removed. For information on converting the intake rates presented in this chapter to dry-weight intake rates, refer to Section 12.4.

The purpose of this chapter is to provide intake data for grain products for the general population. The recommendations for ingestion rates of grain products are provided in the next section, along with a summary of the confidence ratings for these recommendations. The recommended values are based on the key study identified by U.S. Environmental Protection Agency (EPA) for this factor. Following the recommendations, the key study on ingestion of grain products is summarized. Relevant data on ingestion of grain products are also provided. These data are presented to provide the reader with added perspective on the current state-of-knowledge pertaining to ingestion of grain products among children.

12.2. RECOMMENDATIONS

Table 12-1 presents a summary of the recommended values for per capita and consumer-only intake of grain products. Table 12-2 provides confidence ratings for the grain intake recommendations for the general population.

The U.S. EPA analysis of data from the 2003−2006 National Health and Nutrition Examination Survey (NHANES) was used in selecting recommended intake rates. The U.S. EPA analysis was conducted using childhood age groups that differed slightly from U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). However, for the purposes of the recommendations presented here, data were placed in the standardized age categories closest to those used in the analysis.

The NHANES data on which the recommendations are based are short-term survey data and may not necessarily reflect the long-term distribution of average daily intake rates. However, because broad categories of food (i.e., total grains), are eaten on a daily basis throughout the year with minimal seasonality, the short-term distribution may be a reasonable approximation of the long-term distribution, although it will display somewhat increased variability. This implies that the upper percentiles shown here will tend to overestimate the corresponding percentiles of the true long-term distribution. In general, the recommended values based on U.S. EPA's analysis of NHANES data represent the uncooked weight of the edible portion of grain products.

Table 12-1. Recommended Values for Intake of Grains, Edible Portion, Uncooked[a]

Age Group (years)	Per Capita		Consumers Only		Multiple Percentiles	Source
	Mean	95th Percentile	Mean	95th Percentile		
	g/kg-day	g/kg-day	g/kg-day	g/kg-day		
Total Grains						
Birth to 1	3.1	9.5[b]	4.1	10.3[b]	See Table 12-3 and Table 12-4	U.S. EPA Analysis of NHANES 2003–2006
1 to <2	6.4	12.4[b]	6.4	12.4[b]		
2 to <3	6.4	12.4[b]	6.4	12.4[b]		
3 to <6	6.2	11.1	6.2	11.1		
6 to <11	4.4	8.2	4.4	8.2		
11 to <16	2.4	5.0	2.4	5.0		
16 to <21	2.4	5.0	2.4	5.0		
20 to <50	2.2	4.6	2.2	4.6		
≥50	1.7	3.5	1.7	3.5		
Individual Grain Products—See Table 12-5 and Table 12-6						

[a] Analysis was conducted using slightly different childhood age groups than those recommended in *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). Data were placed in the standardized age categories closest to those used in the analysis.

[b] Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Table 12-2. Confidence in Recommendations for Intake of Grain Products

General Assessment Factors	Rationale	Rating
Soundness		High
Adequacy of Approach	The survey methodology and data analysis were adequate. The survey sampled more than 16,000 individuals. An analysis of primary data was conducted.	
Minimal (or defined) Bias	No physical measurements were taken. The method relied on recent recall of grain products eaten.	
Applicability and Utility		High
Exposure Factor of Interest	The key study was directly relevant to grain intake.	
Representativeness	The data were demographically representative of the U.S. population (based on stratified random sample).	
Currency	Data were collected between 2003 and 2006.	
Data Collection Period	Data were collected for two non-consecutive days.	
Clarity and Completeness		High
Accessibility	The NHANES data are publicly available.	
Reproducibility	The methodology used was clearly described; enough information was included to reproduce the results.	
Quality Assurance	NHANES follows strict QA/QC procedures. The U.S. EPA analysis has only been reviewed internally, but the methodology has been used in an analysis of previous data.	
Variability and Uncertainty		
Variability in Population	Full distributions were provided for total grains. Means were provided for individual grain products.	Medium to high for averages, low for long-term upper percentiles; low for individual foods
Minimal Uncertainty	Data collection was based on recall for a two-day period; the accuracy of using these data to estimate long-term intake (especially at the upper percentiles) is uncertain. However, use of short-term data to estimate chronic ingestion can be assumed for broad categories of foods such as total grains. Uncertainty is greater for individual grain products.	
Evaluation and Review		Medium
Peer Review	The NCHS NHANES survey received a high level of peer review. The U.S. EPA analysis of these data has not been peer reviewed outside the Agency, but the methodology has been used in an analysis of previous data.	
Number and Agreement of Studies	There was one key study.	
Overall Rating		**Medium to High** confidence in the averages; **Low** confidence in the long-term upper percentiles

12.3. INTAKE STUDIES

12.3.1. Key Grain Intake Study

12.3.1.1. *U.S. EPA Analysis of Consumption Data From 2003−2006 National Health and Nutrition Examination Survey (NHANES)*

The key source of recent information on consumption rates of grain products is the U.S. Centers for Disease Control and Prevention's National Center for Health Statistics' (NCHS) NHANES. Data from NHANES 2003−2006 have been used by the U.S. EPA, Office of Pesticide Programs (OPP) to generate per capita and consumer-only intake rates for both individual grain products and total grain products.

NHANES is designed to assess the health and nutritional status of adults and children in the United States. In 1999, the survey became a continuous program that interviews a nationally representative sample of approximately 7,000 persons each year and examines a nationally representative sample of about 5,000 persons each year, located in counties across the country, 15 of which are visited each year. Data are released on a 2-year basis; thus, for example, the 2003 data are combined with the 2004 data to produce NHANES 2003−2004.

The dietary interview component of NHANES is called *What We Eat in America* and is conducted by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (DHHS). DHHS' NCHS is responsible for the sample design and data collection, and USDA's Food Surveys Research Group is responsible for the dietary data collection methodology, maintenance of the databases used to code and process the data, and data review and processing. Beginning in 2003, 2 non-consecutive days of 24-hour intake data were collected. The first day was collected in-person, and the second day was collected by telephone, 3 to 10 days later. These data were collected using USDA's dietary data collection instrument, the Automated Multiple Pass Method. This method provides an efficient and accurate means of collecting intakes for large-scale national surveys. It is fully computerized and uses a five-step interview. Details can be found at USDA's Agriculture Research Service (http://www.ars.usda.gov/ba/bhnrc/fsrg).

For NHANES 2003−2004, there were 12,761 persons selected; of these, 9,643 were considered respondents to the mobile examination center (MEC) examination and data collection. However, only 9,034 of the MEC respondents provided complete dietary intakes for Day 1. Furthermore, of those providing the Day 1 data, only 8,354 provided complete dietary intakes for Day 2. For NHANES 2005−2006, there were 12,862 persons selected; of these, 9,950 were considered respondents to the MEC examination and data collection. However, only 9,349 of the MEC respondents provided complete dietary intakes for Day 1. Furthermore, of those providing the Day 1 data, only 8,429 provided complete dietary intakes for Day 2.

The 2003−2006 NHANES surveys are stratified, multistage probability samples of the civilian non-institutionalized U.S. population. The sampling frame was organized using 2000 U.S. population census estimates. NHANES oversamples low income persons, adolescents 12 to 19 years, persons 60 years and older, African Americans, and Mexican Americans. Several sets of sampling weights are available for use with the intake data. By using appropriate weights, data for all 4 years of the surveys can be combined. Additional information on NHANES can be obtained at http://www.cdc.gov/nchs/nhanes.htm.

In 2010, U.S. EPA, OPP used NHANES 2003−2006 data to update the Food Commodity Intake Database (FCID) that was developed in earlier analyses of data from the USDA's Continuing Survey of Food Intake by Individuals (CSFII) (U.S. EPA, 2000; USDA, 2000) (see Section 12.3.2.4), NHANES data on the foods people reported eating were converted to the quantities of agricultural commodities eaten. "Agricultural commodity" is a term used by U.S. EPA to mean plant (or animal) parts consumed by humans as food; when such items are raw or unprocessed, they are referred to as "raw agricultural commodities." For example, an apple pie may contain the commodities apples, flour, fat, sugar, and spices. FCID contains approximately 558 unique commodity names and 8-digit codes. The FCID commodity names and codes were selected and defined by U.S. EPA and were based on the U.S. EPA Food Commodity Vocabulary (http://www.epa.gov/pesticides/foodfeed/).

Intake rates were generated for a variety of food items/groups based on the agricultural commodities included in the FCID. These intake rates represent intake of all forms of the product (e.g., both home produced and commercially produced) for individuals who provided data for two days of the survey. Note that if the person reported consuming food for only one day, their two-day average would be half the amount reported for the one day of consumption. Individuals who did not provide information on body weight or for whom identifying information was unavailable were excluded from the analysis. Two-day average intake rates were calculated for all individuals in the database for each of the food

items/groups. These average daily intake rates were divided by each individual's reported body weight to generate intake rates in units of grams per kilogram of body weight per day (g/kg-day). The data were weighted according to the 4-year, 2-day sample weights provided in NHANES 2003−2006 to adjust the data for the sample population to reflect the national population.

Summary statistics were generated on a consumer-only and on a per capita basis. Summary statistics, including number of observations, percentage of the population consuming the grains being analyzed, mean intake rate, and standard error of the mean intake rate were calculated for total grains and selected individual grains. Percentiles of the intake rate distribution (i.e., 1^{st}, 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, 95^{th}, 99^{th}, and the maximum value) were also provided for total grains. Data were provided for the following age groups: birth to 1 year, 1 to 2 years, 3 to 5 years, 6 to 12 years, 13 to 19 years, 20 to 49 years, and ≥50 years. Data on females 13 to 49 years were also provided. Because these data were developed for use in U.S. EPA's pesticide registration program, the childhood age groups used are slightly different than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).

Table 12-3 presents per capita intake data for total grains in g/kg-day; Table 12-4 provides consumer-only intake data for total grains in g/kg-day. Table 12-5 provides per capita intake data for individual grains in g/kg-day, and Table 12-6 provides consumer-only intake data for individual grains in g/kg-day. In general, these data represent intake of the edible portions of i.e., uncooked foods.

The results are presented in units of g/kg-day. Thus, use of these data in calculating potential dose does not require the body-weight factor to be included in the denominator of the average daily dose (ADD) equation. It should be noted that converting these intake rates into units of g/day by multiplying by a single average body weight is inappropriate, because individual intake rates were indexed to the reported body weights of the survey respondents. Also, it should be noted that the distribution of average daily intake rates generated using short-term data (e.g., 2-day) does not necessarily reflect the long-term distribution of average daily intake rates. The distributions generated from short-term and long-term data will differ to the extent that each individual's intake varies from day to day; the distributions will be similar to the extent that individuals' intakes are constant from day to day. Day-to-day variation in intake among individuals will be high for grains that are not typically eaten every day. For these grains, the intake distribution generated from short-term data will not be a good reflection of the long-term distribution. On the other hand, for broad categories of foods (e.g., total grains) that are eaten on a daily basis throughout the year, the short-term distribution may be a reasonable approximation of the true long-term distribution, although it will show somewhat more variability. In this chapter, distributions are provided for broad categories of grains (e.g., total grains). Because of the increased variability of the short-term distribution, the short-term upper percentiles shown here may overestimate the corresponding percentiles of the long-term distribution. For individual foods, only the mean, standard error, and percent consuming are provided. An advantage of using the U.S. EPA's analysis of NHANES data is that it provides distributions of intake rates for various age groups of children and adults, normalized by body weight. The data set was designed to be representative of the U.S. population and includes 4 years of intake data combined. Another advantage is the currency of the data; the NHANES data are from 2003−2006. However, short-term dietary data may not accurately reflect long-term eating patterns and may under-represent infrequent consumers of a given food. This is particularly true for the tails (extremes) of the distribution of food intake. Because these are 2-day averages, consumption estimates at the upper end of the intake distribution may be underestimated if these consumption values are used to assess acute (i.e., short-term) exposures. Also, the analysis was conducted using slightly different childhood age groups than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). However, given the similarities in the age groups used, the data should provide suitable intake estimates for the age groups of interest.

12.3.2. Relevant Grain Intake Studies

12.3.2.1. *USDA (1996a, b, 1993, 1980)—Food and Nutrient Intakes of Individuals in 1 Day in the United States*

USDA calculated mean per capita intake rates for total and individual grain products using Nationwide Food Consumption Survey (NFCS) data from 1977−1978 and 1987−1988 (USDA, 1993, 1980) and CSFII data from 1994 and 1995 (USDA, 1996a, b). The mean per capita intake rates for grain products are presented in Table 12-7 and Table 12-8 for the two NFCS survey years, respectively. Table 12-9

presents similar data from the 1994 and 1995 CSFII for grain products.

The advantages of using these data are that they provide mean intake estimates for various grain products. The consumption estimates are based on short-term (i.e., 1-day) dietary data, which may not reflect long-term consumption. These data are based on older surveys and may not be entirely representative of current eating patterns.

12.3.2.2. *USDA (1999b)—Food Consumption, Prices, and Expenditures, 1970−1997*

The USDA's Economic Research Service calculates the amount of food available for human consumption in the United States annually. Supply and utilization balance sheets are generated. These are based on the flow of food items from production to end uses. Total available supply is estimated as the sum of production (i.e., some products are measured at the farm level or during processing), starting inventories, and imports (USDA, 1999b). The availability of food for human use commonly termed as "food disappearance" is determined by subtracting exported foods, products used in industries, farm inputs (seed and feed), and end-of-the-year inventories from the total available supply (USDA, 1999b). USDA (1999b) calculates the per capita food consumption by dividing the total food disappearance by the total U.S. population.

USDA (1999b) estimated per capita consumption data for grain products from 1970−1997. In this section, the 1997 values, which are the most recent final data, are presented. Table 12-10 presents per capita consumption in 1997 for grains.

An advantage of this study is that it provides per capita consumption rates for grains that are representative of long-term intake because disappearance data are generated annually. Daily per capita intake rates are generated by dividing annual consumption by 365 days/year. One of the limitations of this study is that disappearance data do not account for losses from the food supply from waste, spoilage, or foods fed to pets. Thus, intake rates based on these data may overestimate daily consumption because they are based on the total quantity of marketable commodity utilized. Therefore, these data may be useful for estimating bounding exposure estimates. It should also be noted that per capita estimates based on food disappearance are not a direct measure of actual consumption or quantity ingested, instead the data are used as indicators of changes in usage over time (USDA, 1999b). These data are based on older surveys and may not be entirely representative of current consumption patterns.

12.3.2.3. *USDA (1999a)—Food and Nutrient Intakes by Children 1994−1996, 1998, Table Set 17*

USDA (1999a) calculated national probability estimates of food and nutrient intake by children based on 4 years of the CSFII (1994−1996 and 1998) for children age 9 years and under, and on CSFII 1994−1996 only for individuals age 10 years and over. The CSFII was a series of surveys designed to measure the kinds and amounts of foods eaten by Americans. Intake data, based on 24-hour dietary recall, were collected through in-person interviews on 2 non-consecutive days. Section 12.3.2.4 provides additional information on these surveys.

USDA used sample weights to adjust for non-response, to match the sample to the U.S. population in terms of demographic characteristics, and to equalize intakes over the four quarters of the year and the 7 days of the week. A total of 503 breast-fed children were excluded from the estimates, but both consumers and non-consumers were included in the analysis.

USDA (1999a) provided data on the mean per capita quantities (grams) of various food products/groups consumed per individual for 1 day, and the percent of individuals consuming those foods in 1 day of the survey. Table 12-11 and Table 12-12 present data on the mean quantities (grams) of grain products consumed per individual for 1 day, and the percentage of survey individuals consuming grain products that survey day. Data on mean intakes or mean percentages are based on respondents' Day-1 intakes.

The advantage of the USDA (1999a) study is that it uses the 1994−1996, 1998 CSFII data set, which includes 4 years of intake data, combined, and includes the supplemental data on children. These data are expected to be generally representative of the U.S. population, and they include data on a wide variety of grain products. The data set is one of a series of USDA data sets that are publicly available. One limitation of this data set is that it is based on 1-day, and short-term dietary data may not accurately reflect long-term eating patterns. Other limitations of this study are that it only provides mean values of food intake rates, consumption is not normalized by body weight, and presentation of results is not consistent with U.S. EPA's recommended age groups. These data are based on older surveys and may not be entirely representative of current eating patterns.

12.3.2.4. *U.S. EPA Analysis of Continuing Survey of Food Intake by Individuals (CSFII) 1994−1996, 1998*

U.S. EPA/OPP, in cooperation with USDA's Agricultural Research Service, used data from the 1994−1996, 1998 CSFII to develop the FCID (U.S. EPA, 2000; USDA, 2000), as described in Section 12.3.1.1. The CSFII 1994−1996 was conducted between January 1994 and January 1997 with a target population of non-institutionalized individuals in all 50 states and Washington, DC. In each of the three survey years, data were collected for a nationally representative sample of individuals of all ages. The CSFII 1998 was conducted between December 1997 and December 1998 and surveyed children 9 years of age and younger. It used the same sample design as the CSFII 1994−1996 and was intended to be merged with CSFII 1994−1996 to increase the sample size for children. The merged surveys are designated as CSFII 1994−1996, 1998 (USDA, 2000). Additional information on the CSFII can be obtained at http://www.ars.usda.gov/Services/docs.htm?docid=14531.

The CSFII 1994−1996, 1998 collected dietary intake data through in-person interviews on two non-consecutive days. The data were based on 24-hour recall. A total of 21,662 individuals provided data for the first day; of those individuals, 20,607 provided data for a second day. The 2-day response rate for the 1994−1996 CSFII was approximately 76%. The 2-day response rate for CSFII 1998 was 82%. The CSFII 1994−1996, 1998 surveys were based on a complex multistage area probability sample design. The sampling frame was organized using 1990 U.S. population census estimates, and the stratification plan took into account geographic location, degree of urbanization, and socioeconomic characteristics. Several sets of sampling weights are available for use with the intake data. By using appropriate weights, data for all 4 years of the surveys can be combined. USDA recommends that all four years be combined in order to provide an adequate sample size for children.

The grain items/groups selected for the U.S. EPA analysis included total grains, and individual grain products such as cereal and rice. U.S. EPA (2003) presents the food codes and definitions used to determine the various grain products used in the analysis. CSFII data on the foods people reported eating were converted to the quantities of agricultural commodities eaten. Intake rates for these food items/groups and summary statistics were generated on both a per capita and a consumer-only basis using the same general methodology as in the U.S. EPA analysis of 2003−2006 NHANES data, as described in Section 12.3.1.1. Because these data were developed for use in U.S. EPA's pesticide registration program, the childhood age groups used are slightly different than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).

Table 12-13 presents per capita intake data for total grains in g/kg-day; Table 12-14 provides consumer-only intake data for total grains in g/kg-day. Table 12-15 provides per capita intake data for individual grain products, and Table 12-16 provides consumer-only intake data for individual grain products. In general, these data represent intake of the edible portions of unprepared (i.e., uncooked) foods. Table 12-17 through Table 12-24 present per capita intake data for individual grain products. The data come from CSFII 1994−1996 only. The results are presented in units of g/kg-day. These data represent as-consumed intake rates.

The results are presented in units of g/kg-day. Thus, use of these data in calculating potential dose does not require the body-weight factor to be included in the denominator of the ADD equation. The cautions concerning converting these intake rates into units of g/day by multiplying by a single average body weight and the discussion of the use of short term data in the NHANES description in Section 12.3.1.1, apply to the CSFII estimates as well.

A strength of U.S. EPA's analysis is that it provides distributions of intake rates for various age groups of individuals, normalized by body weight. The analysis uses the 1994−1996, 1998 CSFII data set, which was designed to be representative of the U.S. population. Also, the data set includes 4 years of intake data combined and is based on a 2-day survey period. However, as discussed above, short-term dietary data may not accurately reflect long-term eating patterns and may under-represent infrequent consumers of a given food. This is particularly true for the tails (extremes) of the distribution of food intake. Also, the analysis was conducted using slightly different childhood age groups than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). However, given the similarities in the childhood age groups used, the data should provide suitable intake estimates for the age groups of interest. While the CSFII data are older than the NHANES data, they provide relevant information on consumption by season, region of the United States,

and urbanization, breakdowns that are not available in the publically released NHANES data.

12.3.2.5. *Smiciklas-Wright et al. (2002)—Foods Commonly Eaten in the United States: Quantities Consumed per Eating Occasion and in a Day, 1994−1996*

Using data gathered in the 1994−1996 USDA CSFII, Smiciklas-Wright et al. (2002) calculated distributions for the quantities of grain products consumed per eating occasion by members of the U.S. population (i.e., serving sizes). The estimates of serving size are based on data obtained from 14,262 respondents, ages two and above, who provided two days of dietary intake information. Only dietary intake data from users of the specified food were used in the analysis (i.e., consumer-only data). Table 12-25 presents, as-consumed, the quantity of grain products consumed per eating occasion and the percentage of individuals using these foods in a 2-day period for a selected variety of grain products. Table 12-26 presents the same data by sex and age.

These data are presented on an as-consumed basis (grams) and represent the quantity of grain products consumed per eating occasion. These estimates may be useful for assessing acute exposures to contaminants in specific foods, or other assessments where the amount consumed per eating occasion is necessary. Only the mean and standard deviation serving size data and percent of the population consuming the food during the 2-day survey period are presented in this handbook. Percentiles of serving sizes of the foods consumed by these age groups of the U.S. population can be found in Smiciklas-Wright et al. (2002).

The advantages of using these data are that they were derived from the USDA CSFII and are representative of the U.S. population. The analysis conducted by Smiciklas-Wright et al. (2002) accounted for individual foods consumed as ingredients of mixed foods. Mixed foods were disaggregated via recipe files so that the individual ingredients could be grouped together with similar foods that were reported separately. Thus, weights of foods consumed as ingredients were combined with weights of foods reported separately to provide a more thorough representation of consumption. However, it should be noted that since the recipes for the mixed foods consumed were not provided by the respondents, standard recipes were used. As a result, the estimates of quantity consumed for some food types are based on assumptions about the types and quantities of ingredients consumed as part of mixed foods. This study used data from the 1994 to 1996 CSFII; data from the 1998 children's supplement were not included.

12.3.2.6. *Vitolins et al. (2002)—Quality of Diets Consumed by Older Rural Adults*

Vitolins et al. (2002) conducted a survey to evaluate the dietary intake, by food groups, of older (>70 years) rural adults. The sample consisted of 130 community dwelling residents from two rural counties in North Carolina. Data on dietary intake over the preceding year were obtained in face-to-face interviews conducted in participants' homes, or in a few cases, a senior center. The food frequency questionnaire used in the survey was a modified version of the National Cancer Institute Health Habits and History Questionnaire; this modified version included an expanded food list containing a greater number of ethnic foods than the original food frequency form. Demographic and personal data collected included sex, ethnicity, age, education, denture use, marital status, chronic disease, and weight.

Food items reported in the survey were grouped into food groups similar to the USDA Food Guide Pyramid and the National Cancer Institute's 5 A Day for Better Health program. These groups are (1) fruits, and vegetables; (2) bread, cereal, rice, and pasta; (3) milk, yogurt, and cheese; (4) meat, fish, poultry, beans, and eggs; and (5) fats, oils, sweets, and snacks. Medians, ranges, frequencies, and percentages were used to summarize intake of each food group, broken down by demographic and health characteristics. In addition, multiple regression models were used to determine which demographic and health factors were jointly predictive of intake of each of the five food groups.

Thirty-four percent of the survey participants were African American, 36% were European American, and 30% were Native American. Sixty-two percent were female, 62% were not married at the time of the interview, and 65% had some high school education or were high school graduates. Almost all of the participants (95%) had one or more chronic diseases. Sixty percent of the respondents were between 70 and 79 years of age; the median age was 78 years old. Table 12-27 presents the median servings of bread, cereal, rice, and pasta broken down by demographic and health characteristic. Only sex was statistically predictive of bread, cereal, rice, and pasta intake ($p < 0.01$), with males consuming approximately an extra serving per day compared to women. Also, the multiple regression model indicated that sex was predictive of

breads, cereal, rice, and pasta intake after controlling for other demographic variables.

One limitation of the study, as noted by the study authors, is that the study did not collect information on the length of time the participants had been practicing the dietary behaviors reported in the survey. The questionnaire asked participants to report the frequency of food consumption during the past year. The study authors noted that, currently, there are no dietary assessment tools that allow the collection of comprehensive dietary data over years of food consumption. Another limitation of the study is that the small sample size used makes associations by sex and ethnicity difficult.

12.3.2.7. *Fox et al. (2004)—Feeding Infants and Toddlers Study: What Foods Are Infants and Toddlers Eating*

Fox et al. (2004) used data from the Feeding Infants and Toddlers study (FITS) to assess food consumption patterns in infants and toddlers. The FITS was sponsored by Gerber Products Company and was conducted to obtain current information on food and nutrient intakes of children, ages 4 to 24 months old, in the 50 states and the District of Columbia. The FITS is described in detail in Devaney et al. (2004). FITS was based on a random sample of 3,022 infants and toddlers for which dietary intake data were collected by telephone from their parents or caregivers between March and July 2002. An initial recruitment and household interview was conducted, followed by an interview to obtain information on intake based on 24-hour recall. The interview also addressed growth, development, and feeding patterns. A second dietary recall interview was conducted for a subset of 703 randomly selected respondents. The study over-sampled children in the 4 to 6 and 9 to 11 months age groups; sample weights were adjusted for non-response, over sampling, and under coverage of some subgroups. The response rate for the FITS was 73% for the recruitment interview. Of the recruited households, there was a response rate of 94% for the dietary recall interviews (Devaney et al., 2004). Table 12-28 shows the characteristics of the FITS population.

Fox et al. (2004) analyzed the first set of 24-hour recall data collected from all study participants. For this analysis, children were grouped into six age categories: 4 to 6 months, 7 to 8 months, 9 to 11 months, 12 to 14 months, 15 to 18 months, and 19 to 24 months. Table 12-29 provides the percentage of infants and toddlers consuming different types of grains or grain products at least once a day. The percentages of children eating any type of grain or grain product ranged from 65.8% for 4 to 6 month-olds to 99.2% for 19- to 24-month-olds.

The advantages of this study is that it represents the U.S. population, and the sample size was large. One limitation of the analysis done by Fox et al. (2004) is that only frequency data were provided; no information on actual intake rates was included. In addition, Devaney et al. (2004) noted several limitations associated with the FITS data. For the FITS, a commercial list of infants and toddlers was used to obtain the sample used in the study. Since many of the households could not be located and did not have children in the target population, a lower response rate than would have occurred in a true national sample was obtained (Devaney et al., 2004). In addition, the sample was likely from a higher socioeconomic status when compared with all U.S. infants in this age group (4 to 24 months old), and the use of a telephone survey may have omitted lower-income households without telephones (Devaney et al., 2004).

12.3.2.8. *Ponza et al. (2004)—Nutrient Food Intakes and Food Choices of Infants and Toddlers Participating in WIC*

Ponza et al. (2004) conducted a study using selected data from the FITS to assess feeding patterns, food choices, and nutrient intake of infants and toddlers participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Ponza et al. (2004) evaluated FITS data for the following age groups: 4 to 6 months (N = 862), 7 to 11 months (N = 1,159), and 12 to 24 months (N = 996). Table 12-30 shows the total sample size described by WIC participants and non-participants.

The foods consumed were analyzed by tabulating the percentage of infants who consumed specific foods/food groups per day (Ponza et al., 2004). Weighted data were used in all of the analyses used in the study (Ponza et al., 2004). Table 12-30 presents the demographic data for WIC participants and non-participants. Table 12-31 provides information on the food choices for the infants and toddlers studied. In general, there was little difference in grain product choices among WIC participants and non-participants, except for the 7 to 11 months age category (see Table 12-31). Non-participants, ages 7 to 11 months, were more likely to eat non-infant cereals than WIC participants.

An advantage of this study is that it had a relatively large sample size and was representative of the U.S. general population of infants and children. A limitation of the study is that intake values for foods

were not provided. Other limitations are those associated with the FITS data, as described previously in Section 12.3.2.7.

12.3.2.9. *Fox et al. (2006)—Average Portion of Foods Commonly Eaten by Infants and Toddlers in the United States*

Fox et al. (2006) estimated average portion sizes consumed per eating occasion by children 4 to 24 months of age who participated in the FITS. The FITS is a cross-sectional study designed to collect and analyze data on feeding practices, food consumption, and usual nutrient intake of U.S. infants and toddlers and is described in Section 12.3.2.7 of this chapter. It included a stratified random sample of 3,022 children between 4 and 24 months of age.

Using the 24-hour recall data, Fox et al. (2006) derived average portion sizes for six major food groups, including breads and grains. Average portion sizes for select individual foods within these major groups were also estimated. For this analysis, children were grouped into six age categories: 4 to 5 months, 6 to 8 months, 9 to 11 months, 12 to 14 months, 15 to 18 months, and 19 to 24 months. Table 12-32 and Table 12-33 present the average portion sizes for grain products for infants and toddlers, respectively.

12.3.2.10. *Mennella et al. (2006)—Feeding Infants and Toddlers Study: The Types of Foods Fed to Hispanic Infants and Toddlers*

Mennella et al. (2006) investigated the types of food and beverages consumed by Hispanic infants and toddlers in comparison to the non-Hispanic infants and toddlers in the United States. The FITS 2002 data for children between 4 and 24 months of age were used for the study. The data represent a random sample of 371 Hispanic and 2,367 non-Hispanic infants and toddlers (Mennella et al., 2006). Mennella et al. (2006) grouped the infants as follows: 4 to 5 months (N = 84 Hispanic; 538 non-Hispanic), 6 to 11 months (N = 163 Hispanic; 1,228 non-Hispanic), and 12 to 24 months (N = 124 Hispanic; 871 non-Hispanic) of age.

Table 12-34 provides the percentage of Hispanic and non-Hispanic infants and toddlers consuming grain products. In most instances, the percentages consuming the different types are similar. However, 6 to 11 month old Hispanic children were more likely to eat rice and pasta than non-Hispanic children in this age groups.

The advantage of the study is that it provides information on food preferences for Hispanic and non-Hispanic infants and toddlers. A limitation is that the study did not provide food intake data but provided frequency of use data instead. Other limitations are those noted previously in Section 12.3.2.7 for the FITS data.

12.4. CONVERSION BETWEEN WET- AND DRY-WEIGHT INTAKE RATES

The intake data presented in this chapter are reported in units of wet weight (i.e., as-consumed or uncooked weight of grain products consumed per day or per eating occasion). However, data on the concentration of contaminants in grain products may be reported in units of either wet or dry weight (e.g., mg contaminant per gram dry weight of grain products). It is essential that exposure assessors be aware of this difference, so that they may ensure consistency between the units used for intake rates and those used for concentration data (i.e., if the contaminant concentration is measured in dry weight of grain products, then the dry-weight units should be used for their intake values).

If necessary, wet-weight (e.g., as-consumed) intake rates may be converted to dry-weight intake rates using the moisture content percentages presented in Table 12-35 and the following equation:

$$IR_{dw} = IR_{ww}\left[\frac{100 - W}{100}\right] \qquad \text{(Eqn. 12-1)}$$

where:

IR_{dw} = dry-weight intake rate,
IR_{ww} = wet-weight intake rate, and
W = percent water content.

Alternatively, dry-weight residue levels in grain products may be converted to wet-weight residue levels for use with wet-weight (e.g., as-consumed) intake rates as follows:

$$C_{ww} = C_{dw}\left[\frac{100 - W}{100}\right] \qquad \text{(Eqn. 12-2)}$$

where:

C_{ww} = wet concentration rate,
C_{dw} = dry-weight concentration, and
W = percent water content.

The moisture data presented in Table 12-35 are for selected grain products taken from USDA (2007).

12.5. REFERENCES FOR CHAPTER 12

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Table 12-3. Per Capita Intake of Total Grains Based 2003–2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	% Consuming	Mean	SE	Percentiles									Max
					1st	5th	10th	25th	50th	75th	90th	95th	99th	
Whole Population	16,783	100	2.6	0.04	0.2	0.6	0.8	1.3	2.0	3.2	5.1	6.7	9.9	34.8*
Age Group														
Birth to 1 year	865	76	3.1	0.20	0.0*	0.0*	0.0	0.1	2.3	5.0	7.5	9.5*	12.5*	34.9*
1 to 2 years	1,052	100	6.4	0.17	1.5*	2.3*	3.0	4.2	5.8	8.4	10.5	12.4*	15.9*	21.1*
3 to 5 years	978	100	6.2	0.13	2.0*	2.4	3.3	4.4	5.9	7.6	9.6	11.1	13.2*	15.6*
6 to 12 years	2,256	100	4.4	0.09	0.6*	1.4	1.8	2.8	4.1	5.5	7.4	8.2	11.1*	14.5*
13 to 19 years	3,450	100	2.4	0.05	0.4	0.7	1.0	1.5	2.1	3.2	4.2	5.0	7.5	14.3*
20 to 49 years	4,289	100	2.2	0.04	0.3	0.6	0.8	1.2	1.9	2.8	3.9	4.6	7.1	15.0*
Females 13 to 49 years	4,103	100	1.9	0.04	0.2	0.5	0.8	1.1	1.7	2.5	3.4	3.9	5.5	9.8*
50 years and older	3,893	100	1.7	0.03	0.3	0.5	0.7	1.0	1.5	2.1	2.9	3.5	5.2	9.4*
Race														
Mexican American	4,450	99	3.0	0.05	0.1	0.8	1.0	1.6	2.4	3.9	5.8	7.2	10.6	17.8*
Non-Hispanic Black	4,265	100	2.4	0.04	0.2	0.5	0.7	1.1	1.8	2.9	5.0	6.8	10.2	21.1*
Non-Hispanic White	6,757	100	2.5	0.05	0.3	0.6	0.8	1.3	1.9	3.1	4.9	6.5	9.6	34.8*
Other Hispanic	562	99	2.7	0.13	0.2*	0.7	1.0	1.5	2.1	3.3	5.3	7.0	9.8*	15.3*
Other Race—Including Multiple Races	749	100	3.0	0.11	0.3*	0.6	0.9	1.5	2.5	3.9	6.0	7.5	11.1*	17.5*

N = Sample size.
SE = Standard error.
Max = Maximum value.
* Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Source: Based on U.S. EPA analysis of 2003–2006 NHANES.

Table 12-4. Consumer-Only Intake of Total Grains Based 2003–2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	Percentiles									Max
				1st	5th	10th	25th	50th	75th	90th	95th	99th	
Whole Population	16,556	2.6	0.04	0.3	0.6	0.8	1.3	2.0	3.2	5.1	6.7	9.9	34.9*
Age Group													
Birth to 1 year	644	4.1	0.18	0.1*	0.4*	0.8*	1.8	3.5	5.9	8.1*	10.3*	13.9*	34.9*
1 to 2 years	1,050	6.4	0.16	1.6*	2.4*	3.0	4.2	5.8	8.4	10.5	12.4*	15.9*	21.1*
3 to 5 years	977	6.2	0.13	2.0*	2.4	3.3	4.4	5.9	7.6	9.6	11.1	13.2*	15.6*
6 to 12 years	2,256	4.4	0.09	0.6*	1.4	1.8	2.8	4.1	5.5	7.4	8.2	11.1*	14.5*
13 to 19 years	3,450	2.4	0.05	0.4	0.7	1.0	1.5	2.1	3.2	4.2	5.0	7.5	14.3*
20 to 49 years	4,288	2.2	0.04	0.3	0.6	0.8	1.2	1.9	2.8	3.9	4.6	7.1	15.0*
Females 13 to 49 years	4,102	1.9	0.03	0.2	0.5	0.8	1.1	1.7	2.5	3.4	3.9	5.5	9.8*
50 years and older	3,891	1.7	0.03	0.3	0.5	0.7	1.0	1.5	2.1	2.9	3.5	5.2	9.4*
Race													
Mexican American	4,341	3.0	0.05	0.4	0.8	1.1	1.6	2.4	3.9	5.9	7.2	10.6	17.8*
Non-Hispanic Black	4,236	2.4	0.04	0.2	0.5	0.7	1.1	1.8	2.9	5.0	6.9	10.3	21.1*
Non-Hispanic White	6,694	2.5	0.05	0.3	0.6	0.8	1.3	2.0	3.1	4.9	6.5	9.6	34.9*
Other Hispanic	548	2.8	0.14	0.4*	0.7	1.0	1.5	2.1	3.4	5.4	7.1	9.8*	15.3*
Other Race—Including Multiple Races	737	3.1	0.11	0.3*	0.7	0.9	1.5	2.5	3.9	6.0	7.5	11.1*	17.5*

N = Sample size.
SE = Standard error.
Max = Maximum value.
* Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Source: Based on U.S. EPA analysis of 2003–2006 NHANES.

Table 12-5. Per Capita Intake of Individual Grain Products Based 2003–2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	% Consuming	Mean	SE	% Consuming	Mean	SE
		Cereal				Rice	
Whole Population	16,783	100	3.7	0.04	88	0.2	0.01
Age Group							
Birth to 1 year	865	81	5.1	0.30	69	1.1	0.08
1 to 2 years	1,052	100	8.7	0.18	87	0.6	0.06
3 to 5 years	978	100	8.6	0.17	91	0.5	0.06
6 to 12 years	2,256	100	6.3	0.10	89	0.3	0.03
13 to 19 years	3,450	100	3.9	0.08	85	0.2	0.01
20 to 49 years	4,289	100	3.2	0.04	89	0.3	0.01
Females 13 to 49 years	4,103	100	2.9	0.04	86	0.2	0.01
50 years and older	3,893	100	2.2	0.04	89	0.1	0.01
Race							
Mexican American	4,450	100	4.3	0.07	87	0.3	0.02
Non-Hispanic Black	4,265	100	3.6	0.06	86	0.3	0.02
Non-Hispanic White	6,757	100	3.6	0.05	88	0.2	0.01
Other Hispanic	562	99	3.9	0.20	92	0.6	0.05
Other Race—Including Multiple Races	749	100	4.1	0.12	90	0.8	0.08

N = Sample size.
SE = Standard error.

Source: Based on U.S. EPA analysis of 2003–2006 NHANES.

Table 12-6. Consumer-Only Intake of Individual Grain Products Based 2003–2006 NHANES (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	*N*	Mean	SE
		Cereal			Rice	
Whole Population	16,613	3.7	0.04	14,447	0.3	0.01
Age Group						
Birth to 1 year	696	6.3	0.31	552	1.5	0.10
1 to 2 years	1,051	8.7	0.18	928	0.7	0.07
3 to 5 years	978	8.6	0.17	875	0.5	0.06
6 to 12 years	2,256	6.3	0.10	2,000	0.3	0.03
13 to 19 years	3,450	3.9	0.08	2,898	0.2	0.02
20 to 49 years	4,289	3.2	0.04	3,812	0.3	0.02
Females 13 to 49 years	4,103	2.9	0.04	3,511	0.2	0.02
50 years and older	3,893	2.2	0.04	3,382	0.2	0.01
Race						
Mexican American	4,372	4.3	0.07	3,757	0.3	0.02
Non-Hispanic Black	4,244	3.6	0.06	3,645	0.3	0.02
Non-Hispanic White	6,707	3.6	0.05	5,887	0.2	0.01
Other Hispanic	550	3.9	0.20	491	0.6	0.05
Other Race—Including Multiple Races	740	4.1	0.13	667	0.8	0.08

N = Sample size.
SE = Standard error.

Source: Based on U.S. EPA analysis of 2003–2006 NHANES.

Table 12-7. Mean Grain Intake per Individual in a Day by Sex and Age (g/day as-consumed)[a] for 1977−1978

Group Age (years)	Total Grains	Breads, Rolls, Biscuits	Other Baked Goods	Cereals, Pasta	Mixtures, Mainly Grain[b]
Males and Females					
<1	42	4	5	30	3
1 to 2	158	27	24	44	63
3 to 5	181	46	37	54	45
6 to 8	206	53	56	60	38
Males					
9 to 11	238	67	56	51	64
12 to 14	288	76	80	57	74
15 to 18	303	91	77	53	82
19 to 22	253	84	53	64	52
23 to 34	256	82	60	40	74
35 to 50	234	82	58	44	50
51 to 64	229	78	57	48	46
65 to 74	235	71	60	69	35
≥75	196	70	50	58	19
Females					
9 to 11	214	58	59	44	53
12 to 14	235	57	61	45	72
15 to 18	196	57	43	41	55
19 to 22	161	44	36	33	48
23 to 34	163	49	38	32	44
35 to 50	161	49	37	32	43
51 to 64	155	52	40	36	27
65 to 74	175	57	42	47	29
≥75	178	54	44	58	22
Males and Females—All Ages	204	62	49	44	49

[a] Based on USDA Nationwide Food Consumption Survey 1977–1978 data for 1 day.
[b] Includes mixtures containing grain as the main ingredient.

Source: USDA (1980).

Table 12-8. Mean Grain Intakes per Individual in a Day by Sex and Age (g/day as-consumed)[a] for 1987−1988

Group Age (years)	Total Grains	Yeast Breads and Rolls	Quick Breads, Pancakes, French Toast	Cakes, Cookies, Pastries, Pies	Crackers, Popcorn, Pretzels, Corn Chips	Cereals and Pastas	Mixtures, Mostly Grain[b]
Males and Females ≤5	167	30	8	22	4	52	51
Males							
6 to 11	268	51	16	37	8	74	83
12 to 19	304	65	28	45	10	72	82
≥20	272	65	20	37	8	58	83
Females							
6 to 11	231	43	19	30	6	66	68
12 to 19	239	45	13	29	7	52	91
≥20	208	45	14	28	6	53	62
All Individuals	237	52	16	32	7	57	72

[a] Based on USDA Nationwide Food Consumption Survey 1987–1988 data for 1 day.
[b] Includes mixtures containing grain as the main ingredient.

Source: USDA (1993).

Table 12-9. Mean Grain Intakes per Individual in a Day by Sex and Age (g/day as-consumed)[a] for 1994−1995

Group Age (years)	Total Grains		Yeast Breads and Rolls		Quick Breads, Pancakes, French Toast		Cakes, Cookies, Pastries, Pies		Crackers, Popcorn, Pretzels, Corn Chips		Cereals and Pastas		Mixtures, Mostly Grain[b]	
	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995
Males and Females ≤5	213	210	26	28	11	11	22	23	8	7	58	57	89	84
Males														
6 to 11	285	341	51	45	15	21	42	46	12	18	66	97	101	115
12 to 19	417	364	53	54	30	21	54	43	17	22	82	84	180	138
≥20	357	365	64	61	22	24	43	46	13	15	86	91	128	128
Females														
6 to 11	260	286	43	46	16	21	37	51	11	14	57	54	94	100
12 to 19	317	296	40	37	16	14	39	35	17	16	63	52	142	143
≥20	254	257	44	45	16	15	33	34	9	10	59	69	92	83
All Individuals	300	303	50	49	18	19	38	39	12	13	70	76	112	107

[a] Based on USDA CSFII 1994 and 1995 data for 1 day.
[b] Includes mixtures containing grain as the main ingredient.

Source: USDA (1996a, b).

Table 12-10. Per Capita Consumption of Flour and Cereal Products in 1997

Food Item	Per Capita Consumption (g/day)[a]
Total Wheat Flour[b]	186
Rye Flour	0.7
Rice[c]	24
Total Corn Products[d]	29
Oat Products[e]	8
Barley Products[f]	0.9
Total Flour and Cereal Products[g]	249

[a] Original data were presented in lbs/year; data were converted to g/day by multiplying by a factor of 454 g/lb and dividing by 365 day/year. Consumption of most items at the processing level. Excludes quantities used in alcoholic beverages and fuel.

[b] Includes white, whole wheat, and durum flour.

[c] Milled basis.

[d] Includes corn flour and meal, hominy and grits, and corn starch.

[e] Includes rolled oats, ready-to-eat oat cereals, oat flour, and oat bran.

[f] Includes barley flour, pearl barley, and malt and malt extract used in food processing.

[g] Excludes wheat not ground into flour.

Source: USDA (1999b).

Table 12-11. Mean Quantities of Grain Products Consumed by Children Under 20 Years of Age, by Sex and Age, per Capita (g/day, as-consumed)[a]

Age Group (years)	Sample Size	Total[b]	Yeast, Breads, and Rolls	Cereals and Pasta				Quick Breads, Pancakes, French Toast	Cakes, Cookies, Pastries, Pies	Crackers, Popcorn, Pretzels, Corn Chips	Mixtures, Mainly Grain[c]
				Total	Ready-to-Eat Cereals	Rice	Pasta				
Males and Females											
<1	1,126	56	2	29	1	2	1[d]	1	3	1	20
1	1,016	192	16	57	11	9	9	9	16	7	87
2	1,102	219	26	62	16	15	12	12	22	9	87
1 to 2	2,118	206	21	59	13	12	11	11	19	8	87
3	1,831	242	30	64	19	13	12	16	23	11	98
4	1,859	264	36	67	22	15	11	17	30	13	102
5	884	284	41	76	24	17	11	15	33	13	107
3 to 5	4,574	264	36	69	22	15	11	16	29	12	102
≤5	7,818	219	27	61	16	13	10	12	22	9	87
Males											
6 to 9	787	310	45	77	28	18	15	23	39	16	109
6 to 11	1,031	318	46	80	31	16	18	23	40	15	115
12 to 19	737	406	54	82	29	27	17	26	49	19	175
Females											
6 to 9	704	284	43	61	21	12	15	18	42	13	107
6 to 11	969	280	43	62	20	14	15	19	42	14	101
12 to 19	732	306	40	67	17	19	22	15	37	15	132
Males and Females											
≤9	9,309	250	34	64	20	14	12	16	30	12	96
≤19	11,287	298	40	69	22	17	15	18	36	14	120

[a] Based on data from 1994–1996, 1998 CSFII.

[b] Includes yeast breads, rolls, cereals, pastas, quick breads, pancakes, French toast, cakes, cookies, pastries, pies, crackers, popcorn, pretzels, corn chips, and mixtures having a grain product as a main ingredient. Excludes grain products that were ingredients in food mixtures coded as a single item and tabulated under another food group; for example, noodles in tuna-noodle casserole are tabulated under Meat, Poultry, and Fish.

[c] Includes mixtures having a grain product as a main ingredient, such as burritos, tacos, pizza, egg rolls, quiche, spaghetti with sauce, rice and pasta mixtures; frozen meals in which the main course is a grain mixture; noodle and rice soups; and baby-food macaroni and spaghetti mixtures.

[d] Estimate is not statistically reliable due to small sample size reporting intake.

Note: Consumption amounts shown are representative of the first day of each participant's survey response.

Source: USDA (1999a).

Table 12-12. Percentage of Individuals Under 20 Years of Age Consuming Grain Products, by Sex and Age (%)[a]

Age Group (years)	Sample Size	Total[b]	Yeast, Breads and Rolls	Cereals and Pasta				Quick Breads, Pancakes, French Toast	Cakes, Cookies, Pastries, Pies	Crackers, Popcorn, Pretzels, Corn Chips	Mixtures, Mainly Grain[c]
				Total	Ready-to-Eat Cereals	Rice	Pasta				
Males and Females											
<1	1,126	70.6	10.9	62.8	9.1	3.4	2.1	4.4	16.5	10.3	15.0
1	1,016	98.2[d]	48.4	70.6	45.3	11.3	9.4	23.0	47.0	39.0	47.8
2	1,102	99.0[d]	58.7	71.1	51.9	14.4	9.4	27.5	46.6	37.9	45.3
1 to 2	2,118	98.7	53.7	70.9	48.7	12.9	9.4	25.3	46.8	38.4	46.5
3	1,831	99.4[d]	64.1	69.7	53.3	11.1	8.6	28.8	46.1	38.5	49.0
4	1,859	99.5[d]	67.0	69.1	54.8	11.4	7.1	28.6	52.3	39.4	46.2
5	884	99.9[d]	69.2	70.4	54.9	11.4	6.8	25.2	52.4	32.1	47.4
3 to 5	4,574	99.6[d]	66.8	69.7	54.3	11.3	7.5	27.5	50.3	36.7	47.5
≤5	7,818	95.8	55.5	69.3	46.9	10.9	7.5	24.0	45.0	34.1	43.3
Males											
6 to 9	787	98.9[d]	69.8	62.6	50.8	10.5	7.4	28.1	52.5	36.0	44.5
6 to 11	1,031	99.0[d]	69.1	64.0	52.4	9.7	8.1	27.1	52.3	33.8	45.3
12 to 19	737	98.2[d]	62.7	44.6	33.2	10.0	5.9	24.4	41.3	27.2	46.2
Females											
6 to 9	704	99.7[d]	71.5	61.2	47.6	9.0	7.9	26.3	57.1	38.3	48.0
6 to 11	969	99.3[d]	71.0	59.3	45.6	9.4	7.1	27.1	55.0	37.1	45.7
12 to 19	732	97.6[d]	60.9	45.9	30.3	8.6	9.3	19.8	40.6	30.9	46.1
Males and Females											
≤9	9,309	97.2	61.6	66.4	47.9	10.5	7.6	25.3	48.9	35.3	44.4
≤19	11,287	97.6	62.4	57.6	41.7	9.9	7.6	24.2	46.1	32.5	45.1

[a] Based on data from 1994–1996, 1998 CSFII.

[b] Includes yeast breads, rolls, cereals, pastas, quick breads, pancakes, French toast, cakes, cookies, pastries, pies, crackers, popcorn, pretzels, corn chips, and mixtures having a grain product as a main ingredient. Excludes grain products that were ingredients in food mixtures coded as a single item and tabulated under another food group; for example, noodles in tuna-noodle casserole are tabulated under Meat, Poultry, and Fish.

[c] Includes mixtures having a grain product as a main ingredient, such as burritos, tacos, pizza, egg rolls, quiche, spaghetti with sauce, rice and pasta mixtures; frozen meals in which the main course is a grain mixture; noodle and rice soups; and baby-food macaroni and spaghetti mixtures.

[d] Estimate is not statistically reliable due to small sample size reporting intake.

Note: Percentages shown are representative of the first day of each participant's survey response.

Source: USDA (1999a).

Table 12-13. Per Capita Intake of Total Grains Based on 1994–1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Percent Consuming	Mean	SE	Percentiles									
					1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	20,607	99.5	2.7	0.0	0.2	0.6	0.9	1.3	2.1	3.3	5.2	6.8	10.3	31.6
Age group														
Birth to 1 year	1,486	70.5	2.5	0.1	0.0	0.0	0.0	0.0	1.6	3.8	6.2	8.6	12.7	26.3
1 to 2 years	2,096	99.8	6.4	0.1	1.1	2.1	2.8	4.2	5.9	7.9	10.4	12.1	16.8	31.6
3 to 5 years	4,391	100.0	6.3	0.1	1.8	2.6	3.2	4.3	5.9	7.8	9.9	11.5	15.6	27.0
6 to 12 years	2,089	100.0	4.3	0.1	0.9	1.7	2.0	2.8	4.0	5.4	7.0	8.2	11.1	17.2
13 to 19 years	1,222	100.0	2.5	0.1	0.4	0.8	1.1	1.5	2.3	3.1	4.4	5.1	7.9	12.4
20 to 49 years	4,677	99.9	2.2	0.0	0.3	0.6	0.8	1.3	1.9	2.8	3.9	4.7	7.1	16.1
≥50 years	4,646	100.0	1.7	0.0	0.3	0.6	0.7	1.1	1.5	2.1	2.8	3.5	4.9	11.2
Season														
Fall	4,687	99.5	2.6	0.0	0.2	0.6	0.9	1.3	2.1	3.3	5.0	6.6	10.0	26.3
Spring	5,308	99.6	2.7	0.0	0.2	0.6	0.8	1.3	2.1	3.4	5.5	7.0	10.5	29.4
Summer	5,890	99.5	2.6	0.0	0.3	0.7	0.9	1.3	2.1	3.3	5.1	6.8	10.5	28.2
Winter	4,722	99.5	2.7	0.0	0.2	0.6	0.9	1.4	2.1	3.3	5.2	6.8	10.1	31.6
Race														
Asian, Pacific Islander	557	98.5	3.6	0.2	0.0	1.1	1.5	2.3	3.2	4.7	6.2	7.3	11.2	24.6
Black	2,740	99.4	2.6	0.1	0.1	0.5	0.7	1.1	1.9	3.3	5.4	7.3	11.5	29.4
American Indian, Alaskan Native	177	99.7	2.9	0.2	0.3	0.5	0.8	1.3	2.2	4.2	6.3	7.5	12.0	16.8
Other/NA	1,638	98.8	3.1	0.1	0.0	0.7	0.9	1.5	2.4	4.1	6.1	7.7	11.7	27.0
White	15,495	99.6	2.6	0.0	0.3	0.7	0.9	1.3	2.0	3.2	5.0	6.6	9.8	31.6
Region														
Midwest	4,822	99.7	2.7	0.0	0.3	0.7	0.9	1.4	2.1	3.4	5.3	7.0	10.4	23.8
Northeast	3,692	99.6	2.8	0.0	0.3	0.7	1.0	1.4	2.2	3.5	5.3	6.8	11.0	31.6
South	7,208	99.5	2.5	0.0	0.2	0.6	0.8	1.2	1.9	3.0	5.0	6.6	9.7	28.2
West	4,885	99.4	2.8	0.1	0.2	0.7	0.9	1.4	2.2	3.5	5.4	7.0	10.3	20.8
Urbanization														
Central City	6,164	99.5	2.7	0.0	0.1	0.6	0.9	1.3	2.1	3.5	5.4	7.0	10.7	29.4
Suburban	9,598	99.5	2.7	0.0	0.3	0.7	0.9	1.4	2.1	3.4	5.3	6.9	10.0	31.6
Non-metropolitan	4,845	99.6	2.4	0.1	0.3	0.6	0.8	1.2	1.9	2.9	4.8	6.3	10.4	23.8

N = Sample size.
SE = Standard error.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 12-14. Consumer-Only Intake of Total Grains Based on 1994–1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Mean	SE	Percentiles									
				1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	20,157	2.7	0.0	0.3	0.7	0.9	1.3	2.1	3.3	5.2	6.8	10.3	31.6
Age Group													
Birth to 1 year	1,048	3.6	0.1	0.1	0.3	0.6	1.4	2.8	4.8	7.4	9.2	13.4	26.3
1 to 2 years	2,092	6.4	0.1	1.2	2.1	2.8	4.2	5.9	7.9	10.4	12.1	16.8	31.6
3 to 5 years	4,389	6.3	0.1	1.8	2.6	3.2	4.3	5.9	7.8	9.9	11.5	15.6	27.0
6 to 12 years	2,089	4.3	0.1	0.9	1.7	2.0	2.8	4.0	5.4	7.0	8.2	11.1	17.2
13 to 19 years	1,222	2.5	0.1	0.4	0.8	1.1	1.5	2.3	3.1	4.4	5.1	7.9	12.4
20 to 49 years	4,673	2.2	0.0	0.3	0.6	0.8	1.3	1.9	2.8	3.9	4.7	7.1	16.1
≥50 years	4,644	1.7	0.0	0.3	0.6	0.7	1.1	1.5	2.1	2.8	3.5	4.9	11.2
Season													
Fall	4,587	2.6	0.0	0.3	0.7	0.9	1.3	2.1	3.3	5.0	6.6	10.0	26.3
Spring	5,190	2.7	0.0	0.3	0.7	0.9	1.3	2.1	3.4	5.5	7.0	10.6	29.4
Summer	5,751	2.7	0.0	0.4	0.7	0.9	1.4	2.1	3.3	5.2	6.8	10.5	28.2
Winter	4,629	2.7	0.0	0.3	0.7	0.9	1.4	2.1	3.3	5.2	6.8	10.1	31.6
Race													
Asian, Pacific Islander	527	3.7	0.2	0.8	1.2	1.6	2.3	3.2	4.7	6.2	7.3	11.2	24.6
Black	2,675	2.6	0.1	0.2	0.5	0.7	1.1	1.9	3.3	5.4	7.3	11.5	29.4
American Indian, Alaskan Native	175	3.0	0.2	0.3	0.5	0.8	1.3	2.2	4.2	6.3	7.5	12.0	16.8
Other/NA	1,570	3.2	0.1	0.5	0.7	1.0	1.5	2.4	4.1	6.2	7.7	11.7	27.0
White	15,210	2.6	0.0	0.4	0.7	0.9	1.3	2.0	3.2	5.1	6.6	9.8	31.6
Region													
Midwest	4,743	2.7	0.0	0.4	0.7	0.9	1.4	2.1	3.4	5.3	7.0	10.4	23.8
Northeast	3,628	2.8	0.0	0.4	0.8	1.0	1.4	2.2	3.5	5.3	6.8	11.0	31.6
South	7,053	2.5	0.0	0.3	0.6	0.8	1.2	1.9	3.0	5.0	6.6	9.8	28.2
West	4,733	2.8	0.1	0.4	0.7	0.9	1.4	2.2	3.5	5.4	7.0	10.3	20.8
Urbanization													
Central City	6,023	2.8	0.0	0.3	0.7	0.9	1.3	2.1	3.5	5.4	7.0	10.7	29.4
Suburban	9,378	2.7	0.0	0.4	0.7	0.9	1.4	2.1	3.4	5.3	6.9	10.0	31.6
Non-metropolitan	4,756	2.4	0.1	0.3	0.6	0.8	1.2	1.9	2.9	4.8	6.4	10.4	23.8

N = Sample size.
SE = Standard error.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 12-15. Per Capita Intake of Individual Grain Products Based on 1994–1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	*N*	Cereal			Rice		
		Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
Whole Population	20,607	99.6	3.7	0.03	86.5	0.3	0.01
Age Group							
Birth to 1 year	1,486	74.6	4.0	0.14	60.2	0.7	0.04
1 to 2 years	2,096	99.8	8.4	0.08	86.4	0.6	0.03
3 to 5 years	4,391	100.0	8.7	0.07	87.9	0.5	0.03
6 to 12 years	2,089	100.0	6.2	0.06	88.0	0.4	0.02
13 to 19 years	1,222	100.0	4.1	0.06	85.8	0.3	0.02
20 to 49 years	4,677	99.9	3.1	0.04	88.3	0.3	0.01
≥50 years	4,646	100.0	2.2	0.02	84.5	0.2	0.01
Season							
Fall	4,687	99.6	3.7	0.06	85.1	0.3	0.02
Spring	5,308	99.6	3.8	0.07	87.1	0.3	0.02
Summer	5,890	99.5	3.8	0.06	86.9	0.3	0.02
Winter	4,722	99.6	3.7	0.05	87.1	0.3	0.02
Race							
Asian, Pacific Islander	557	98.5	4.4	0.20	96.6	1.7	0.19
Black	2,740	99.5	3.8	0.12	86.3	0.3	0.02
American Indian, Alaskan Native	177	99.7	4.2	0.15	92.6	0.3	0.10
Other/NA	1,638	98.9	4.3	0.12	85.9	0.6	0.08
White	15,495	99.7	3.7	0.04	86.2	0.2	0.01
Region							
Midwest	4,822	99.7	3.9	0.09	88.2	0.2	0.02
Northeast	3,692	99.7	3.7	0.06	87.2	0.3	0.03
South	7,208	99.6	3.6	0.04	85.0	0.2	0.01
West	4,885	99.4	3.8	0.09	86.7	0.4	0.03
Urbanization							
Central City	6,164	99.6	3.8	0.06	87.2	0.4	0.02
Suburban	9,598	99.5	3.8	0.05	86.6	0.3	0.02
Non-metropolitan	4,845	99.7	3.5	0.06	85.6	0.2	0.01

N = Sample size.
SE = Standard error.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 12-16. Consumer-Only Intake of Individual Grain Products Based on 1994–1996, 1998 CSFII (g/kg-day, edible portion, uncooked weight)

Population Group	Cereal			Rice		
	N	Mean	SE	*N*	Mean	SE
Whole Population	20,227	3.8	0.03	17,481	0.3	0.01
Age Group						
Birth to 1 year	1,116	5.4	0.16	900	1.2	0.07
1 to 2 years	2,092	8.4	0.08	1,819	0.7	0.04
3 to 5 years	4,389	8.7	0.07	3,869	0.6	0.03
6 to 12 years	2,089	6.2	0.06	1,847	0.4	0.02
13 to 19 years	1,222	4.1	0.06	1,038	0.3	0.03
20 to 49 years	4,674	3.1	0.04	4,102	0.3	0.01
≥50 years	4,645	2.2	0.02	3,906	0.2	0.01
Season						
Fall	4,598	3.7	0.06	3,957	0.3	0.02
Spring	5,213	3.8	0.07	4,530	0.3	0.02
Summer	5,768	3.8	0.06	4,989	0.3	0.02
Winter	4,648	3.7	0.06	4,005	0.3	0.02
Race						
Asian, Pacific Islander	529	4.5	0.20	513	1.8	0.19
Black	2,683	3.8	0.12	2,346	0.4	0.02
American Indian, Alaskan Native	175	4.3	0.15	151	0.3	0.10
Other/NA	1,579	4.4	0.13	1,375	0.7	0.08
White	15,261	3.7	0.04	13,096	0.2	0.01
Region						
Midwest	4,759	3.9	0.09	4,186	0.2	0.02
Northeast	3,639	3.7	0.06	3,152	0.4	0.04
South	7,081	3.6	0.04	6,029	0.3	0.01
West	4,748	3.9	0.09	4,114	0.5	0.03
Urbanization						
Central City	6,039	3.8	0.06	5,303	0.5	0.03
Suburban	9,410	3.8	0.05	8,105	0.3	0.02
Non-metropolitan	4,778	3.6	0.06	4,073	0.2	0.02

N = Sample size.
SE = Standard error.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 12-17. Per Capita Intake of Breads[a] Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	87.2	1.1	0.01	0.0	0.0	0.0	0.4	0.9	1.5	2.3	3.1	5.1	20.0
Age Group													
≤5 months	0.9	0.0	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
6 to 12 months	30.2	0.5	0.16	0.0	0.0	0.0	0.0	0.0	0.5	1.8	3.0	4.8	7.3
<1 year	14.6	0.3	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.7	4.6	7.3
1 to 2 years	77.2	2.0	0.06	0.0	0.0	0.0	0.4	1.4	2.9	4.4	6.0	8.5	20.0
3 to 5 years	86.5	2.3	0.05	0.0	0.0	0.0	0.9	2.0	3.3	4.7	5.8	8.7	13.2
6 to 11 years	87.1	1.7	0.04	0.0	0.0	0.0	0.7	1.4	2.4	3.5	4.3	6.7	11.3
12 to 19 years	86.2	1.1	0.03	0.0	0.0	0.0	0.4	0.9	1.5	2.3	2.8	4.0	7.5
20 to 39 years	88.1	0.9	0.02	0.0	0.0	0.0	0.4	0.8	1.3	2.0	2.5	3.9	6.2
40 to 69 years	90.0	0.9	0.01	0.0	0.0	0.0	0.4	0.8	1.3	1.9	2.3	3.5	8.4
≥70 years	91.6	0.9	0.02	0.0	0.0	0.2	0.4	0.8	1.3	1.9	2.3	2.9	4.3
Season													
Fall	87.4	1.1	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.4	3.1	4.9	14.6
Spring	87.1	1.1	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.3	3.1	5.1	11.6
Summer	87.3	1.1	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.4	3.1	5.2	17.1
Winter	86.9	1.1	0.02	0.0	0.0	0.0	0.4	0.8	1.4	2.3	3.1	5.1	20.0
Race													
Asian	69.1	0.8	0.06	0.0	0.0	0.0	0.0	0.4	1.2	1.9	2.9	4.5	14.6
Black	83.1	1.1	0.03	0.0	0.0	0.0	0.3	0.7	1.4	2.3	3.3	6.3	11.6
American Indian/Alaska Native	82.2	1.4	0.18	0.0	0.0	0.0	0.3	0.9	1.7	3.6	4.1	6.2	20.0
Other/NA	80.4	1.2	0.04	0.0	0.0	0.0	0.3	0.9	1.6	2.7	3.4	5.6	7.5
White	89.0	1.1	0.01	0.0	0.0	0.0	0.4	0.9	1.5	2.3	3.0	4.9	17.1
Region													
Midwest	89.1	1.2	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.5	3.3	5.7	12.0
Northeast	88.3	1.1	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.3	2.9	4.5	9.8
South	87.5	1.1	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.3	3.1	4.9	17.1
West	83.7	1.1	0.02	0.0	0.0	0.0	0.3	0.8	1.4	2.4	3.2	5.1	20.0
Urbanization													
Central City	85.6	1.1	0.02	0.0	0.0	0.0	0.4	0.8	1.4	2.3	3.1	5.1	13.2
Suburban	87.7	1.1	0.01	0.0	0.0	0.0	0.4	0.9	1.5	2.4	3.1	5.0	14.6
Non-metropolitan	88.5	1.1	0.02	0.0	0.0	0.0	0.4	0.9	1.5	2.3	3.1	5.0	20.0

[a] Includes breads, rolls, muffins, bagels, biscuits, cornbread, and tortillas.
SE = Standard error.
Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-18. Per Capita Intake of Sweets[a] Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	52.6	0.6	0.01	0.0	0.0	0.0	0.0	0.1	0.8	1.8	2.5	4.6	22.0
Age Group													
≤5 months	2.5	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6
6 to 12 months	23.0	0.3	0.14	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.0	3.6	6.4
<1 year	12.1	0.2	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	3.6	6.4
1 to 2 years	53.2	1.2	0.07	0.0	0.0	0.0	0.0	0.3	1.7	3.5	4.8	7.2	19.3
3 to 5 years	62.1	1.3	0.06	0.0	0.0	0.0	0.0	0.8	1.9	3.6	4.6	8.8	22.0
6 to 11 years	64.2	1.2	0.06	0.0	0.0	0.0	0.0	0.6	1.7	3.2	3.9	6.7	20.9
12 to 19 years	54.3	0.6	0.03	0.0	0.0	0.0	0.0	0.2	1.0	1.8	2.4	3.7	10.7
20 to 39 years	47.2	0.4	0.02	0.0	0.0	0.0	0.0	0.0	0.6	1.4	1.9	3.2	11.1
40 to 69 years	52.9	0.5	0.02	0.0	0.0	0.0	0.0	0.1	0.7	1.3	1.9	3.2	7.3
≥70 years	58.6	0.5	0.03	0.0	0.0	0.0	0.0	0.2	0.8	1.6	2.1	3.6	5.7
Season													
Fall	53.7	0.6	0.03	0.0	0.0	0.0	0.0	0.2	0.9	1.8	2.5	4.7	20.9
Spring	52.2	0.6	0.02	0.0	0.0	0.0	0.0	0.1	0.8	1.8	2.6	4.7	22.0
Summer	50.0	0.5	0.02	0.0	0.0	0.0	0.0	0.0	0.7	1.6	2.3	4.1	18.2
Winter	54.5	0.6	0.03	0.0	0.0	0.0	0.0	0.2	0.9	1.9	2.6	4.8	12.3
Race													
Asian	40.2	0.4	0.08	0.0	0.0	0.0	0.0	0.0	0.6	1.4	2.0	3.1	15.7
Black	41.4	0.5	0.04	0.0	0.0	0.0	0.0	0.0	0.6	1.5	2.3	4.7	19.3
American Indian/Alaska Native	35.3	0.4	0.11	0.0	0.0	0.0	0.0	0.0	0.3	1.7	2.1	2.8	2.9
Other/NA	35.0	0.4	0.05	0.0	0.0	0.0	0.0	0.0	0.5	1.3	1.9	4.1	7.0
White	56.3	0.6	0.01	0.0	0.0	0.0	0.0	0.2	0.9	1.8	2.5	4.7	22.0
Region													
Midwest	60.1	0.7	0.03	0.0	0.0	0.0	0.0	0.3	1.0	2.0	2.9	5.3	22.0
Northeast	55.4	0.6	0.03	0.0	0.0	0.0	0.0	0.2	0.9	1.7	2.5	4.8	12.7
South	49.1	0.6	0.02	0.0	0.0	0.0	0.0	0.0	0.8	1.7	2.3	4.4	20.9
West	47.7	0.5	0.02	0.0	0.0	0.0	0.0	0.0	0.7	1.6	2.3	3.8	15.7
Urbanization													
Central City	51.2	0.6	0.02	0.0	0.0	0.0	0.0	0.1	0.8	1.6	2.3	4.6	20.9
Suburban	54.6	0.6	0.02	0.0	0.0	0.0	0.0	0.2	0.9	1.8	2.6	4.5	12.7
Non-metropolitan	50.5	0.6	0.03	0.0	0.0	0.0	0.0	0.1	0.8	1.8	2.5	5.1	22.0

[a] Includes breakfast foods made with grains such as pancakes, waffles, and French toast.
SE = Standard error.

Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-19. Per Capita Intake of Snacks Containing Grains[a] Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	43.1	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.2	2.6	9.1
Age Group													
≤5 months	1.0	0.0	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.7
6 to 12 months	29.0	0.3	0.08	0.0	0.0	0.0	0.0	0.0	0.2	0.9	2.2	2.5	2.8
<1 year	14.1	0.1	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.9	2.2	3.7
1 to 2 years	58.1	0.7	0.04	0.0	0.0	0.0	0.0	0.4	1.1	2.0	2.8	5.0	8.9
3 to 5 years	56.7	0.7	0.04	0.0	0.0	0.0	0.0	0.3	0.9	1.8	3.2	5.9	9.1
6 to 11 years	51.3	0.5	0.03	0.0	0.0	0.0	0.0	0.1	0.6	1.3	1.9	4.6	7.3
12 to 19 years	45.0	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.4	2.4	5.1
20 to 39 years	41.1	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.9	1.8	5.5
40 to 69 years	41.1	0.1	0.01	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	1.4	5.6
≥70 years	37.7	0.1	0.01	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.8	1.8
Season													
Fall	42.3	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.0	2.3	8.0
Spring	43.6	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.3	2.9	8.9
Summer	40.6	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.0	2.3	7.1
Winter	45.8	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.3	2.9	9.1
Race													
Asian	24.1	0.1	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.3	4.4
Black	29.5	0.2	0.02	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.9	2.1	7.4
American Indian/Alaska Native	38.3	0.2	0.08	0.0	0.0	0.0	0.0	0.0	0.2	0.6	1.1	3.2	4.9
Other/NA	28.4	0.2	0.03	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	2.4	8.7
White	47.1	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.2	2.7	9.1
Region													
Midwest	49.2	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.2	2.7	8.9
Northeast	41.9	0.2	0.02	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.2	2.7	9.1
South	41.1	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.1	2.4	8.0
West	40.7	0.2	0.02	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.2	2.6	8.7
Urbanization													
Central City	40.1	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.1	2.6	7.8
Suburban	44.6	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.2	2.7	9.1
Non-metropolitan	44.1	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.1	2.3	8.1

[a] Includes grain snacks such as crackers, salty snacks, popcorn, and pretzels.
SE = Standard error.

Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-20. Per Capita Intake of Breakfast Foods[a] Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	11.8	0.1	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.4	13.6
Age Group													
≤5 months	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 to 12 months	4.2	0.1	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	4.1
<1 year	2.0	0.1	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	4.1
1 to 2 years	20.4	0.4	0.07	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.7	4.8	13.6
3 to 5 years	20.8	0.4	0.06	0.0	0.0	0.0	0.0	0.0	0.0	1.6	2.5	4.5	8.0
6 to 11 years	23.7	0.4	0.05	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.2	3.4	6.5
12 to 19 years	13.0	0.1	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	2.3	3.9
20 to 39 years	8.9	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.5	3.0
40 to 69 years	9.5	0.1	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.4	3.8
≥70 years	10.4	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.2	3.5
Season													
Fall	11.6	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.3	13.6
Spring	11.6	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.3	6.4
Summer	12.8	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	2.4	6.0
Winter	11.3	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	2.6	8.0
Race													
Asian	5.9	0.1	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.0	2.8
Black	12.7	0.1	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.2	2.1	6.7
American Indian/Alaska Native	8.8	0.1	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	1.2
Other/NA	10.2	0.1	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.6	8.0
White	12.0	0.1	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.4	13.6
Region													
Midwest	12.1	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1	2.6	6.7
Northeast	12.7	0.1	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.2	2.3	8.0
South	10.7	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.2	7.8
West	12.4	0.2	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	2.6	13.6
Urbanization													
Central City	12.0	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.5	13.6
Suburban	12.2	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	2.4	7.8
Non-metropolitan	10.7	0.1	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	2.2	6.4

[a] Includes breakfast food made with grains such as pancakes, waffles, and French toast.
SE = Standard error.
Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-21. Per Capita Intake of Pasta Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	13.0	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.2	5.1	29.1
Age Group													
≤5 months	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 to 12 months	7.5	0.1	0.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.3	6.7
<1 year	3.5	0.1	0.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	6.7
1 to 2 years	16.0	0.8	0.15	0.0	0.0	0.0	0.0	0.0	0.0	3.4	6.2	10.6	16.7
3 to 5 years	12.8	0.6	0.13	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.4	8.4	14.3
6 to 11 years	13.4	0.5	0.12	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.8	7.5	11.9
12 to 19 years	11.7	0.3	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.1	4.2	29.1
20 to 39 years	13.9	0.3	0.04	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.2	4.1	11.2
40 to 69 years	13.7	0.2	0.03	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.9	3.6	11.8
≥70 years	9.0	0.2	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.9	7.7
Season													
Fall	13.6	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	4.7	16.7
Spring	13.2	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.3	5.8	14.7
Summer	12.6	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.1	5.2	15.4
Winter	12.6	0.3	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.1	5.1	29.1
Race													
Asian	19.4	0.5	0.17	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.3	6.6	11.2
Black	7.0	0.2	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.6	29.1
American Indian/Alaska Native	1.8	0.1	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	3.6
Other/NA	9.6	0.2	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.5	15.4
White	14.1	0.3	0.03	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.3	5.3	16.7
Region													
Midwest	12.1	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.1	5.2	16.7
Northeast	20.1	0.5	0.05	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.8	5.9	15.4
South	9.5	0.2	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	4.4	29.1
West	13.2	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.2	5.7	14.1
Urbanization													
Central City	13.4	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.5	5.3	29.1
Suburban	14.0	0.3	0.03	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.2	5.3	16.7
Non-metropolitan	10.3	0.2	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	4.2	14.1

SE = Standard error.

Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-22. Per Capita Intake of Cooked Cereals Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	10.4	0.4	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.3	7.2	72.5
Age Group													
≤5 months	0.9	0.1	0.54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6
6 to 12 months	16.6	1.9	1.18	0.0	0.0	0.0	0.0	0.0	0.0	9.4	16.1	22.8	22.8
<1 year	8.3	0.9	0.82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	22.8	22.8
1 to 2 years	18.4	1.6	0.29	0.0	0.0	0.0	0.0	0.0	0.0	6.9	10.7	20.6	33.9
3 to 5 years	16.0	1.3	0.28	0.0	0.0	0.0	0.0	0.0	0.0	5.3	7.9	16.1	72.5
6 to 11 years	8.7	0.5	0.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	9.4	24.1
12 to 19 years	5.6	0.2	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.3	10.6
20 to 39 years	6.2	0.1	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.3	9.2
40 to 69 years	11.6	0.3	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.9	4.4	8.7
≥70 years	24.5	0.6	0.07	0.0	0.0	0.0	0.0	0.0	0.0	2.2	3.4	5.6	10.6
Season													
Fall	12.0	0.4	0.08	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.6	8.1	45.9
Spring	9.1	0.3	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6.4	20.9
Summer	9.3	0.3	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	6.9	72.5
Winter	11.1	0.4	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.5	7.4	44.5
Race													
Asian	4.4	0.2	0.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	16.1
Black	20.1	0.7	0.10	0.0	0.0	0.0	0.0	0.0	0.0	2.2	4.4	10.9	33.9
American Indian/Alaska Native	7.6	0.3	0.32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	5.8	12.3
Other/NA	7.6	0.4	0.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	10.6	72.5
White	9.3	0.3	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6.1	45.9
Region													
Midwest	9.6	0.3	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	5.7	45.9
Northeast	9.0	0.3	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	5.9	72.5
South	12.4	0.4	0.06	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.6	7.9	31.7
West	9.4	0.4	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	8.0	39.5
Urbanization													
Central City	11.6	0.4	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.6	8.1	72.5
Suburban	9.9	0.3	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	6.9	45.9
Non-metropolitan	9.7	0.3	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	5.7	26.9

SE = Standard error.

Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-23. Per Capita Intake of Ready-to-Eat Cereals[a] Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	39.7	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.5	2.9	10.1
Age													
≤5 months	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 to 12 months	19.9	0.1	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	1.8	2.6
<1 year	9.3	0.1	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7	2.6
1 to 2 years	64.9	1.0	0.04	0.0	0.0	0.0	0.0	0.7	1.5	2.5	3.3	4.9	8.8
3 to 5 years	69.8	1.1	0.04	0.0	0.0	0.0	0.0	0.9	1.7	2.6	3.3	4.8	10.1
6 to 11 years	64.0	0.8	0.03	0.0	0.0	0.0	0.0	0.6	1.2	2.0	2.5	4.0	8.0
12 to 19 years	45.7	0.4	0.02	0.0	0.0	0.0	0.0	0.0	0.6	1.1	1.5	2.2	6.4
20 to 39 years	30.5	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.0	1.7	5.3
40 to 69 years	31.8	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.9	1.4	5.2
≥70 years	47.9	0.2	0.01	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.9	1.5	2.7
Season													
Fall	39.1	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.4	1.1	1.6	2.9	8.8
Spring	40.1	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.5	2.9	7.7
Summer	39.6	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.4	1.1	1.6	3.0	7.8
Winter	39.9	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.4	2.7	10.1
Race													
Asian	25.4	0.2	0.05	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.2	2.7	4.9
Black	34.0	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.5	3.2	10.1
American Indian/Alaska Native	33.1	0.3	0.09	0.0	0.0	0.0	0.0	0.0	0.4	0.8	1.4	2.6	4.4
Other/NA	33.3	0.3	0.04	0.0	0.0	0.0	0.0	0.0	0.3	1.1	1.7	3.0	6.6
White	41.7	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.5	2.8	8.8
Region													
Midwest	42.2	0.4	0.02	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.6	2.9	8.0
Northeast	42.3	0.4	0.02	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.6	2.9	8.0
South	37.4	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.3	2.8	10.1
West	38.4	0.3	0.02	0.0	0.0	0.0	0.0	0.0	0.4	1.1	1.6	3.1	8.8
Urbanization													
Central City	40.0	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.5	2.8	10.1
Suburban	41.2	0.4	0.01	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.6	3.1	8.0
Non-metropolitan	35.8	0.3	0.01	0.0	0.0	0.0	0.0	0.0	0.4	0.8	1.2	2.6	8.8

[a] Includes dry ready-to-eat corn, rice, wheat, and bran cereals in the form of flakes, puffs, etc.
SE = Standard error.

Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-24. Per Capita Intake of Baby Cereals Based on 1994–1996, 1998 CSFII (g/kg-day, as-consumed)

Population Group	Percent Consuming	Percentile											
		Mean	SE	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max
Whole Population	1.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	37.6
Age													
≤5 months	40.8	0.8	0.24	0.0	0.0	0.0	0.0	0.0	1.0	2.4	3.1	8.8	26.6
6 to 12 months	67.8	2.5	0.45	0.0	0.0	0.0	0.0	0.8	2.8	6.9	11.3	21.1	37.6
<1 year	53.4	1.6	0.27	0.0	0.0	0.0	0.0	0.2	1.7	4.1	7.3	19.7	37.6
1 to 2 years	6.2	0.2	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.8	12.5
3 to 5 years	0.3	0.0	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
6 to 11 years	0.1	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
12 to 19 years	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 to 39 years	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40 to 69 years	0.1	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
≥70 years	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Season													
Fall	0.9	0.0	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.1
Spring	1.2	0.0	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	26.6
Summer	0.8	0.0	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0
Winter	1.1	0.0	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	37.6
Race													
Asian	0.7	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Black	1.0	0.0	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.6
American Indian/Alaska Native	0.6	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Other/NA	1.7	0.1	0.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	26.6
White	1.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0
Region													
Midwest	1.1	0.0	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	21.1
Northeast	1.2	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	12.5
South	0.9	0.0	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.6
West	0.9	0.0	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.6
Urbanization													
Central City	1.1	0.0	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	37.6
Suburban	1.1	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	21.1
Non-metropolitan	0.8	0.0	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0

SE = Standard error.

Source: U.S. EPA analysis of the 1994–1996 CSFII.

Table 12-25. Quantity (as-consumed) of Grain Products Consumed per Eating Occasion and the Percentage of Individuals Using These Foods in 2 Days

Food Category	% Indiv. Using Food at Least Once in 2 days	Quantity Consumed per Eating Occasion (grams)		Consumers Only Quantity Consumed per Eating Occasion at Specified Percentiles (grams)						
		Average	SE	5th	10th	25th	50th	75th	90th	95th
White bread	59.6	50	1	21	24	33	46	52	78	104
Whole grain and wheat bread	28.1	50	1	24	25	37	50	56	72	92
Rolls	48.0	58	1	27	33	43	48	70	89	110
Biscuits	10.9	61	1	19	19	35	57	76	104	139
Tortillas	15.5	60	1	14	21	32	48	79	107	135
Quick breads and muffins	12.5	82	2	21	28	52	60	94	142	187
Doughnuts and sweet rolls	12.4	77	1	26	36	47	65	93	133	164
Crackers	17.4	26	1	6	9	12	18	30	47	62
Cookies	30.7	40	1	9	12	20	31	50	75	96
Cake	16.2	92	3	22	28	41	77	116	181	217
Pie	8.5	150	3	52	72	102	143	168	246	300
Pancakes and waffles	10.3	85	3	21	35	42	75	109	158	205
Cooked cereal	10.3	248	6	81	117	157	233	291	455	484
Oatmeal	6.1	264	6	116	117	176	232	333	454	473
Ready-to-eat cereal	40.6	54	1	18	24	30	46	67	93	113
Corn flakes	8.1	46	1	17	22	25	37	56	75	100
Toasted oat rings	6.8	42	1	14	16	27	38	54	65	83
Rice	28.0	150	3	27	40	76	131	192	312	334
Pasta	36.0	162	3	26	43	73	133	210	318	420
Macaroni and cheese	8.5	244	9	53	81	121	191	324	477	556
Spaghetti with tomato sauce	8.0	436	15	122	124	246	371	494	740	983
Pizza	19.9	169	5	36	52	78	140	214	338	422

SE = Standard error.

Source: Smiciklas-Wright et al. (2002) (based on 1994–1996 CSFII data).

Table 12-26. Quantity (as-consumed) of Grain Products Consumed per Eating Occasion and Percentage of Individuals Using These Foods in 2 Days, by Sex and Age

Food Category	Quantity Consumed per Eating Occasion (grams)											
	2 to 5 years			6 to 11 years			12 to 19 years					
	Males and Females (*N* = 2,109)			Males and Females (*N* = 1,432)			Males (*N* = 696)			Females (*N* = 702)		
	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE
White bread	66.9	34	[a]	67.1	42	1	61.3	56	1	57.9	47	1
Whole grain and wheat bread	24.3	37	1	20.5	44	1	14.5	60	2	17.6	53	2
Rolls	40.0	39	1	53.5	48	1	61.9	69	2	48.8	51	1
Biscuits	8.3	38	2	9.7	48	3	12.2	72	4	10.3	55	4
Tortillas	14.6	32	2	16.4	47	2	22.9	76	5	20.1	56	3
Quick breads and muffins	9.6	55	4	9.6	67	5	11.0	125	12	11.0	79	10
Doughnuts and sweet rolls	11.3	59	2	13.4	69	2	17.3	102	12	13.8	78	5
Crackers	25.4	17	1	17.2	26	2	10.6	39	5	14.2	26	3
Cookies	51.0	28	1	46.7	37	2	29.0	53	3	31.8	42	2
Cake	14.6	70	3	19.7	79	4	15.1	99	9	15.5	85	8
Pie	2.9	76	8	5.6	116	8	6.6	188	15	4.8	138[b]	12[b]
Pancakes and waffles	19.1	49	1	21.5	77	3	13.5	96	6	8.2	74	5
Cooked cereal	16.8	211	10	9.0	245	14	5.2	310[b]	29[b]	6.0	256[b]	31[b]
Oatmeal	10.4	221	9	5.7	256	19	2.4	348[b]	45[b]	2.3	321[b]	40[b]
Ready-to-eat cereal	72.9	33	1	67.3	47	1	45.6	72	3	46.3	52	2
Corn flakes	11.2	33	2	13.1	42	2	10.4	62	4	8.7	49	4
Toasted oat rings	20.6	30	1	12.5	45	2	7.3	62	5	8.1	42	3
Rice	29.6	84	3	24.6	124	6	24.2	203	10	28.8	157	10
Pasta	49.4	90	3	41.4	130	5	33.4	203	9	37.8	155	9
Macaroni and cheese	17.8	159	8	13.2	217	13	7.5	408	46	10.7	260	30
Spaghetti with tomato sauce	16.8	242	11	11.5	322	18	10.1	583	46	8.5	479	51
Pizza	23.7	86	3	32.8	108	6	39.6	205	13	30.5	143	8
Corn chips	19.6	29	2	25.6	33	2	26.9	58	5	25.1	44	3
Popcorn	11.6	20	1	12.7	31	2	7.8	54	5	10.5	37	4

Table 12-26. Quantity (as-consumed) of Grain Products Consumed per Eating Occasion and Percentage of Individuals Using These Foods in 2 Days, by Sex and Age (continued)

Food Category	Quantity Consumed per Eating Occasion (g)																	
	20 to <40 years						40 to <60 years						≥60 years					
	Males (*N* = 1,543)			Females (*N* = 1,449)			Males (*N* = 1,663)			Females (*N* = 1,694)			Males (*N* = 1,545)			Females (*N* = 1,429)		
	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE	PC	Mean	SE
White bread	63.0	63	2	54.9	47	1	59.7	59	2	55.3	46	1	59.3	51	1	54.8	41	1
Whole grain and wheat bread	25.3	63	1	25.2	48	1	32.8	57	1	32.3	46	2	39.8	48	1	43.1	41	1
Rolls	62.0	73	4	46.4	53	1	47.9	65	1	43.4	52	1	37.8	54	1	30.6	43	1
Biscuits	11.5	73	3	9.4	55	2	13.4	80	3	11.2	56	2	13.0	58	3	9.8	48	3
Tortillas	20.6	79	4	20.1	53	2	13.4	67	3	12.7	52	2	4.2	47	4	5.4	41	2
Quick breads and muffins	8.0	93	7	11.3	79	5	15.7	93	7	14.9	72	4	17.4	86	5	18.3	72	4
Doughnuts and sweet rolls	13.3	94	5	11.2	68	2	13.4	88	4	11.0	72	4	11.4	65	2	10.4	56	2
Crackers	11.9	36	3	15.6	28	2	16.6	30	1	17.5	24	1	25.6	23	1	25.9	17	1
Cookies	20.8	56	4	26.5	39	2	27.6	47	2	29.0	36	1	29.7	40	2	32.2	30	1
Cake	13.5	113	6	14.9	94	7	16.5	108	6	16.8	83	4	19.2	85	4	18.3	87	7
Pie	5.8	161	7	7.2	150	9	11.8	162	6	9.9	151	8	16.4	154	7	13.3	137	5
Pancakes and waffles	8.0	126	15	7.4	80	6	7.5	117	8	8.0	74	5	10.8	99	5	8.2	68	4
Cooked cereal	5.2	313	30	7.3	219	11	9.7	300	16	10.3	243	11	20.9	255	8	20.2	216	8
Oatmeal	2.7	360[a]	42[a]	3.7	258	17	6.0	332	16	6.2	242	10	13.6	257	10	12.9	224	10
Ready-to-eat cereal	26.9	77	3	34.7	55	1	29.8	68	2	29.7	51	1	44.6	53	1	44.0	41	1
Corn flakes	6.5	73	6	5.3	43	2	5.9	49	3	5.2	40	3	12.4	37	2	10.4	30	1
Toasted oat rings	4.2	62	4	5.4	42	2	4.8	46	2	4.1	35	2	4.3	36	3	4.9	27	2
Rice	30.8	199	9	32.1	139	6	29.4	167	5	28.8	130	4	23.1	147	6	21.4	118	5
Pasta	37.1	214	8	37.1	155	6	34.3	208	7	34.7	140	5	27.9	167	7	27.9	132	5
Macaroni and cheese	7.8	301	19	7.8	235	19	6.1	302	31	6.0	210	12	7.1	230	13	6.5	215	18
Spaghetti with tomato sauce	8.6	630	48	7.8	385	22	5.5	543	59	5.4	386	18	5.0	450	22	4.5	379	33
Pizza	23.7	253	12	20.2	150	6	13.0	220	13	14.5	147	8	5.3	187	18	4.7	109	8
Corn chips	16.2	61	5	17.9	35	2	12.8	47	4	12.0	33	2	4.8	30	3	5.3	21	2
Popcorn	8.1	63	6	9.7	35	2	9.6	50	4	10.9	39	3	6.1	52	4	7.6	34	3

[a] Indicates a SE value that is greater than 0 but less than 0.5.
[b] Indicates a statistic that is potentially unreliable because of small sample size or large coefficient of variation.
N = Sample size.
PC = Percent consuming at least once in 2 days.
SE = Standard error of the mean.

Source: Smiciklas-Wright et al. (2002) (based on 1994–1996 CSFII data).

Table 12-27. Consumption of Major Food Groups by Older Adults: Median Daily Servings (and ranges) by Demographic and Health Characteristics

Subject Characteristic	*N*	Bread, Cereal, Rice and Pasta (servings/day)
Sex		[a]
Females	80	2.7 (0.9–6.5)
Males	50	3.6 (1.4–7.3)
Ethnicity		
African American	44	3.3 (1.4–6.4)
European American	47	3.2 (0.9–6.8)
Native American	39	2.9 (1.1–7.3)
Age		
70 to 74 years	42	3.3 (1.1–6.3)
75 to 79 years	36	3.0 (0.9–6.8)
80 to 84 years	36	3.2 (1.5–6.4)
≥85 years	16	3.6 (1.6–7.3)
Marital Status		
Married	49	3.3 (1.1–5.8)
Not Married	81	3.0 (0.9–7.3)
Education		
8th grade or less	37	3.1 (1.1–7.3)
9th to 12th grades	47	3.3 (1.1–6.8)
>High School	46	3.2 (0.9–6.5)
Dentures		
Yes	83	3.3 (1.1–6.4)
No	47	3.1 (0.9–7.3)
Chronic Diseases		
0	7	4.1 (2.2–6.4)
1	31	3.3 (0.9–7.3)
2	56	3.1 (1.1–5.8)
3	26	3.7 (1.1–5.8)
≥4	10	2.9 (1.4–5.3)
Weight[b]		
≤130 pounds	18	3.1 (1.1–5.4)
131 to 150 pounds	32	3.3 (0.9–5.2)
151 to 170 pounds	27	3.1 (1.4–7.3)
171 to 190 pounds	22	3.6 (1.4–6.2)
≥191 pounds	29	3.0 (1.1–6.8)

[a] $p < 0.05$.
[b] 2 missing values.
N = Number of subjects.

Source: Vitolins et al. (2002).

Table 12-28. Characteristics of the Feeding Infant and Toddlers Study (FITS) Sample Population

	Sample Size	Percentage of Sample
Sex		
Males	1,549	51.3
Females	1,473	48.7
Age of Child		
4 to 6 months	862	28.5
7 to 8 months	483	16.0
9 to 11 months	679	22.5
12 to 14 months	374	12.4
15 to 18 months	308	10.2
19 to 24 months	316	10.4
Child's Ethnicity		
Hispanic or Latino	367	12.1
Non-Hispanic or Latino	2,641	87.4
Missing	14	0.5
Child's Race		
White	2,417	80.0
Black	225	7.4
Other	380	12.6
Urbanicity		
Urban	1,389	46.0
Suburban	1,014	33.6
Rural	577	19.1
Missing	42	1.3
Household Income		
Under $10,000	48	1.6
$10,000 to $14,999	48	1.6
$15,000 to $24,999	221	7.3
$25,000 to $34,999	359	11.9
$35,000 to $49,999	723	23.9
$50,000 to $74,999	588	19.5
$75,000 to $99,999	311	10.3
$100,000 and Over	272	9.0
Missing	452	14.9
Receives WIC		
Yes	821	27.2
No	2,196	72.6
Missing	5	0.2
Sample Size (Unweighted)	3,022	100.0

WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Source: Devaney et al. (2004).

Table 12-29. Percentage of Infants and Toddlers Consuming Different Types of Grain Products

Food Group/Food	Percentage of Infants and Toddlers Consuming at Least Once in a Day					
	4 to 6 Months	7 to 8 Months	9 to 11 Months	12 to 14 Months	15 to 18 Months	19 to 24 Months
Any Grain or Grain Product	65.8	91.5	97.5	97.8	98.6	99.2
Infant Cereals	64.8	81.2	63.8	23.9	9.2	3.1
Non-infant Cereals[a]	0.6	18.3	44.3	58.9	60.5	51.9
Not Pre-sweetened	0.5	17.0	37.0	44.5	40.6	31.9
Pre-sweetened[b]	0.0	1.8	9.0	17.7	26.4	22.7
Breads and Rolls[c]	0.6	9.9	24.5	47.3	52.7	53.1
Crackers, Pretzels, Rice Cakes	3.0	16.2	33.4	45.2	46.4	44.7
Cereal or Granola Bars	0.0	1.1	3.4	9.8	10.0	9.7
Pancakes, Waffles, French Toast	0.1	0.8	7.5	15.1	16.1	15.4
Rice and Pasta[d]	2.3	4.5	18.2	26.2	39.0	35.9
Other	0.2	0.1	2.7	2.8	2.5	4.5
Grains in Mixed Dishes	0.4	5.3	24.1	48.3	52.0	55.1
Sandwiches	0.0	1.1	8.6	21.5	25.8	25.8
Burrito, Taco, Enchilada, Nachos	0.0	0.0	1.0	4.5	2.8	2.1
Macaroni and Cheese	0.2	1.6	4.9	14.6	15.0	15.0
Pizza	0.1	0.7	2.2	6.8	9.0	9.4
Pot Pie/Hot Pocket	0.0	0.9	0.5	2.0	1.0	1.8
Spaghetti, Ravioli, Lasagna	0.1	1.8	9.9	15.3	12.1	8.8

[a] Includes both ready-to-eat and cooked cereals.
[b] Defined as cereals with more than 21.1 grams sugar per 100 grams.
[c] Does not include bread in sandwiches. Sandwiches are included in mixed dishes.
[d] Does not include rice or pasta in mixed dishes.

Source: Fox et al. (2004).

Table 12-30. Characteristics of Women, Infants, and Children (WIC) Participants and Non-Participants[a] (percentages)

	Infants 4 to 6 month		Infants 7 to 11 month		Toddlers 12 to 24 month	
	WIC Participant	Non-Participant	WIC Participant	Non-Participant	WIC Participant	Non-Participant
Sex						
Males	55	54	55	51	57	52
Females	45	46 [b]	45	49 [b]	43	48 [b]
Child's Ethnicity						
Hispanic or Latino	20	11	24	8	22	10
Non-Hispanic or Latino	80	89 [b]	76	92 [b]	78	89 [b]
Child's Race						
White	69	84	63	86	67	84
Black	15	4	17	5	13	5
Other	22	11	20	9 [b]	20	11 [c]
Child in Daycare						
Yes	39	38	34	46	43	53
No	61	62 [b]	66	54 [b]	57	47 [b]
Age of Mother						
14 to 19 years	18	1	13	1	9	1
20 to 24 years	33	13	38	11	33	14
25 to 29 years	29	29	23	30	29	26
30 to 34 years	9	33	15	36	18	34
≥35 years	9	23	11	21	11	26
Missing	2	2 [b]	1	1 [b]	0	1 [b]
Mother's Education						
11th Grade or Less	23	2	15	2	17	3
Completed High School	35	19	42	20	42	19
Some Postsecondary	33	26	32	27	31	28
Completed College	7	53	9	51	9	48
Missing	2	1 [b]	2	0 [b]	1	2 [b]
Parent's Marital Status						
Married	49	93	57	93	58	88
Not Married	50	7	42	7	41	11
Missing	1	1	1	0 [b]	1	1 [c]
Mother or Female Guardian Works						
Yes	46	51	45	60	55	61
No	53	48	54	40	45	38
Missing	1	1	1	0	0	1

Table 12-30. Characteristics of Women, Infants, and Children (WIC) Participants and Non-Participants[a] (percentages) (continued)

	Infants 4 to 6 months		Infants 7 to 11 months		Toddlers 12 to 24 months	
	WIC Participant	Non-Participant	WIC Participant	Non-Participant	WIC Participant	Non-Participant
Urbanicity		[c]		[c]		[c]
Urban	34	55	37	50	35	48
Suburban	36	31	31	34	35	35
Rural	28	13	30	15	28	16
Missing	2	1	2	1	2	2
Sample Size (Unweighted)	265	597	351	808	205	791

[a] χ^2 tests were conducted to test for statistical significance in the differences between WIC participants and non-participants within each age group for each variable. The results of χ^2 tests are listed next to the variable under the column labeled non-participants for each of the three age groups.
[b] = $p < 0.05$ non-participants significantly different from WIC participants on the variable.
[c] = $p < 0.01$ non-participants significantly different from WIC participants on the variable.

WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Source: Ponza et al. (2004).

Table 12-31. Food Choices for Infants and Toddlers by Women, Infants, and Children (WIC) Participation Status

	Infants 4 to 6 months		Infants 7 to 11 months		Toddlers 12 to 24 months	
	WIC Participant	Non-Participant	WIC Participant	Non-Participant	WIC Participant	Non-Participant
Infant Cereals	69.7	62.5	74.7	69.7	13.5	9.2
Non-infant Cereals, Total	0.9	0.5	21.7	38.5[a]	58.1	56.0
Not Pre-sweetened	0.5	0.5	18.7	32.9[a]	43.7	36.3
Pre-sweetened	0.0	0.0	4.0	6.9	17.7	24.1
Grains in Combination Foods	0.9	0.1	18.8	14.7	50.3	52.9
Sample Size (unweighted)	265	597	351	808	205	791

[a] = $p < 0.01$ non-participants significantly different from WIC participants.
WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

Source: Ponza et al. (2004).

Table 12-32. Average Portion Sizes per Eating Occasion of Grain Products Commonly Consumed by Infants From the 2002 Feeding Infants and Toddlers Study

Food Group	Reference Unit	4 to 5 months (*N* = 624)	6 to 8 months (*N* = 708)	9 to 11 months (*N* = 687)
		Mean ± SE		
Infant cereal, dry	tablespoon	3.1 ± 0.14	4.5 ± 0.14	5.2 ± 0.18
Infant cereal, jarred	tablespoon	-	5.6 ± 0.26	7.4 ± 0.34
Ready-to-eat cereal	tablespoon	-	2.3 ± 0.34	3.4 ± 0.21
Crackers	ounce	-	0.2 ± 0.02	0.3 ± 0.01
Crackers	saltine	-	2.2 ± 0.14	2.7 ± 0.12
Bread	slice	-	0.5 ± 0.10	0.8 ± 0.06

\- = Cell size was too small to generate a reliable estimate.
N = Number of respondents.
SE = Standard error of the mean.

Source: Fox et al. (2006).

Table 12-33. Average Portion Sizes per Eating Occasion of Grain Products Commonly Consumed by Toddlers From the 2002 Feeding Infants and Toddlers Study

Food Group	Reference Unit	12 to 14 months (*N* = 371)	15 to 18 months (*N* = 312)	19 to 24 months (*N* = 320)
		Mean ± SE		
Bread	slice	0.8 ± 0.04	0.9 ± 0.05	0.9 ± 0.05
Rolls	ounce	0.9 ± 0.11	1.0 ± 0.10	0.9 ± 0.15
Ready-to-eat cereal	cup	0.3 ± 0.02	0.5 ± 0.03	0.6 ± 0.04
Hot cereal, prepared	cup	0.6 ± 0.05	0.6 ± 0.05	0.7 ± 0.05
Crackers	ounce	0.3 ± 0.02	0.4 ± 0.02	0.4 ± 0.02
Crackers	saltine	3.3 ± 0.22	3.5 ± 0.22	3.7 ± 0.22
Pasta	cup	0.4 ± 0.04	0.4 ± 0.04	0.5 ± 0.05
Rice	cup	0.3 ± 0.04	0.4 ± 0.05	0.4 ± 0.05
Pancakes and waffles	1 (4-inch diameter)	1.0 ± 0.08	1.4 ± 0.21	1.4 ± 0.17

N = Number of respondents.
SE = Standard error of the mean.

Source: Fox et al. (2006).

Table 12-34. Percentage of Hispanic and Non-Hispanic Infants and Toddlers Consuming Different Types of Grain Products on a Given Day

	Age 4 to 5 months		Age 6 to 11 months		Age 12 to 24 months	
	Hispanic (*N* = 84)	Non-Hispanic (*N* = 538)	Hispanic (*N* = 163)	Non-Hispanic (*N* = 1,228)	Hispanic (*N* = 124)	Non-Hispanic (*N* = 871)
Any Grain or Grain Product	56.5	56.9	95.0	93.5	97.1	98.9
Infant Cereal	55.2	56.5	74.1	73.6	15.9	9.3
Non-infant Cereal	-	-	18.5[a]	29.2	45.3	57.8
Breads[b]	1.4[c]	-	18.2	15.1	44.0	52.9
Tortillas	1.4[c]	-	4.0[c]	-	6.7[a, c]	0.6[c]
Crackers, Pretzels, Rice Cakes	1.3[c]	-	27.8	22.5	35.6	46.9
Pancakes, Waffles, French Toast	-	-	1.4[c]	4.3	13.0	16.0
Rice and Pasta[d]	-	-	20.1[a]	10.3	44.3	32.9
Rice	-	-	15.9[e]	4.7	26.9[a, c]	13.0
Grains in Mixed Dishes	-	-	15.9	13.0	38.8[a]	54.4
Sandwiches	-	-	4.0[c]	4.6	24.2	24.9
Burrito, Taco, Enchilada, Nachos	-	-	1.3[c]	-	2.1[c]	3.0
Macaroni and Cheese	-	-	3.0[c]	3.1	10.1	15.5
Pizza	-	-	-	1.4	1.0[c, e]	9.7
Spaghetti, Ravioli, Lasagna	-	-	8.3[c]	4.6	9.3[c]	12.1

[a] = Significantly different from non-Hispanic at $p < 0.05$.

[b] Does not include bread in sandwiches. Sandwiches are included in mixed dishes. Includes tortillas, also shown separately.

[c] = Statistic is potentially unreliable because of a high coefficient of variation.

[d] Does not include rice or pasta in mixed dishes. Includes rice (e.g., white, brown, wild, and Spanish rice without meat) and pasta (e.g., spaghetti, macaroni, and egg noodles). Rice is also shown separately.

[e] = Significantly different from non-Hispanic at $p < 0.01$.

- = Less than 1% of the group consumed this food on a given day.

N = Sample size.

Source: Mennella et al. (2006).

Table 12-35. Mean Moisture Content of Selected Grain Products Expressed as Percentages of Edible Portions (grams per 100 grams of edible portion)

Food	Moisture Content		Comments
	Raw	Cooked	
Barley—pearled	10.09	68.80	
Corn—grain—endosperm	10.37	-	
Corn—grain—bran	4.71	-	crude
Millet	8.67	71.41	
Oats	8.22	-	
Rice—white—long-grained	11.62	68.44	
Rye	10.95	-	
Rye—flour—medium	9.85	-	
Sorghum	9.20	-	
Wheat—hard white	9.57	-	
Wheat—germ	11.12	-	crude
Wheat—bran	9.89	-	crude
Wheat—flour—whole grain	10.27	-	

- Indicates that the grain product was not assessed for water content under these conditions.

Source: USDA (2007).

13. INTAKE OF HOME-PRODUCED FOODS

13.1. INTRODUCTION

Ingestion of home-produced foods can be a pathway for exposure to environmental contaminants. Home-produced foods can become contaminated in various ways. Ambient pollutants in the air may be deposited on plants, adsorbed onto or absorbed by the plants, or dissolved in rainfall or irrigation waters that contact the plants. Pollutants also may be adsorbed onto plant roots from contaminated soil and water. Finally, the addition of pesticides, soil additives, and fertilizers to crops or gardens may result in contamination of food products. Meat and dairy products can become contaminated if animals consume contaminated soil, water, or feed crops. Farmers, as well as rural and urban residents who consume home-produced foods, may be potentially exposed if these foods become contaminated. Exposure via the consumption of home-produced foods may be a significant route of exposure for these populations [U.S. Environmental Protection Agency (EPA) (1996, 1989)]. For example, consumption of home-produced fruits, vegetables, game, and fish has been shown to have an effect on blood lead levels in areas where soil lead contamination exists (U.S. EPA, 1994). At Superfund sites where soil contamination is found, ingestion of home-produced foods has been considered a potential route of exposure (U.S. EPA, 1993, 1991). Assessing exposures to individuals who consume home-produced foods requires knowledge of intake rates of such foods.

Data from the 1987–1988 Nationwide Food Consumption Survey (NFCS) were used to generate intake rates for home-produced foods. The methods used to analyze the 1987–1988 NFCS data are presented in Section 13.3.

13.2. RECOMMENDATIONS

The data presented in this section may be used to assess exposure to contaminants in foods grown, raised, or caught at a specific site. Table 13-1 presents the recommended values for mean and upper percentile (i.e., 95th percentile) intake rates among consumers of the various home-produced food groups. The consumer-only data presented represent average daily intake rates of food items/groups over the 7-day survey period and do not account for variations in eating habits during the rest of the year. Thus, the recommended upper- percentile values, as well as the percentiles of the distributions presented in Section 13.3.1 may not necessarily reflect the long-term distribution of average daily intake of home-produced foods. Table 13-1 also provides mean and 95th percentile per capita intake rates for populations that garden, farm, or raise animals. Table 13-2 presents the confidence ratings for home-produced food intake.

Because the consumer-only home-produced food intake rates presented in this chapter (See Section 13.3.1) are based on foods as brought into the household and not in the form in which they are consumed, preparation loss factors should be applied as appropriate. These factors are necessary to convert intake rates to those that are representative of foods "as consumed." The per capita data presented in this chapter (See Section 13.3.2) account for preparation and post-cooking losses. Additional conversions may be necessary for both consumer-only and per capita data to ensure that the form of the food used to estimate intake (e.g., wet or dry weight) is consistent with the form used to measure contaminant concentration (see Section 13.3).

The NFCS data used to generate intake rates of home-produced foods are more than 20 years old and may not be reflective of current eating patterns among consumers of home-produced foods. Although the U.S. Department of Agriculture (USDA) and others have conducted other food consumption studies since the release of the 1987–1988 NFCS, these studies do not include information on home-produced foods.

Because the consumer-only analysis was conducted prior to the issuance of EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005), the age groups used are not entirely consistent with recent guidelines. Also, recommended home-produced food intake rates are not provided for children less than 1 year of age because the methodology used is based on the apportionment of home-produced foods used by a household among the members of that household who consume those foods. It was assumed that the diets of children under 1 year of age differ markedly from that of other household members; thus, they were not assumed to consume any portion of the home-produced food brought into the home.

Table 13-1. Summary of Recommended Values for Intake of Home-Produced Foods

Age Group[a]	Mean	95th Percentile	Multiple Percentiles	Source
	g/kg-day			
Home-Produced Fruits				
Consumers Only, Unadjusted[b]				
1 to 2 years	8.7	60.6	See Table 13-5	U.S. EPA Analysis of 1987–1988 NFCS
3 to 5 years	4.1	8.9		
6 to 11 years	3.6	15.8		
12 to 19 years	1.9	8.3		
20 to 39 years	2.0	6.8		
40 to 69 years	2.7	13.0		
≥70 years	2.3	8.7		
Per Capita for Populations That Garden or Farm, Adjusted[c]				
1 to <2 years	1.0 (1.4)	4.8 (9.1)	NA	Phillips and Moya (2012)
2 to <3 years	1.0 (1.4)	4.8 (9.1)		
3 to <6 years	0.78 (1.0)	3.6 (6.8)		
6 to <11 years	0.40 (0.52)	1.9 (3.5)		
11 to <16 years	0.13 (0.17)	0.62 (1.2)		
16 to <21 years	0.13 (0.17)	0.62 (1.2)		
21 to <50 years	0.15 (0.20)	0.70 (1.3)		
50+ years	0.24 (0.31)	1.1 (2.1)		
Home-Produced Vegetables				
Consumers Only, Unadjusted[b]				
1 to 2 years	5.2	19.6	See Table 13-10	U.S. EPA Analysis of 1987–1988 NFCS
3 to 5 years	2.5	7.7		
6 to 11 years	2.0	6.2		
12 to 19 years	1.5	6.0		
20 to 39 years	1.5	4.9		
40 to 69 years	2.1	6.9		
≥70 years	2.5	8.2		
Per Capita for Populations That Garden or Farm, Adjusted[c]				
1 to <2 years	1.3 (2.7)	7.1 (14)	NA	Phillips and Moya (2012)
2 to <3 years	1.3 (2.7)	7.1 (14)		
3 to <6 years	1.1 (2.3)	6.1 (12)		
6 to <11 years	0.80 (1.6)	4.2 (8.1)		
11 to <16 years	0.56 (1.1)	3.0 (5.7)		
16 to <21 years	0.56 (1.1)	3.0 (5.7)		
21 to <50 years	0.56 (1.1)	3.0 (5.7)		
50+ years	0.60 (1.2)	3.2 (6.1)		

Table 13-1. Summary of Recommended Values for Intake of Home-Produced Foods (continued)

Age Group[a]	Mean	95th Percentile	Multiple Percentiles	Source
	g/kg-day			
Home-Produced Meats				
Consumers Only, Unadjusted[b]				
1 to 2 years	3.7	10.0	See Table 13-15	U.S. EPA Analysis of 1987–1988 NFCS
3 to 5 years	3.6	9.1		
6 to 11 years	3.7	14.0		
12 to 19 years	1.7	4.3		
20 to 39 years	1.8	6.2		
40 to 69 years	1.7	5.2		
≥70 years	1.4	3.5		
Per Capita for Populations That Farm or Raise Animals, Adjusted[c]				
1 to <2 years	1.4 (1.4)	5.8 (6.0)	NA	Phillips and Moya (2012)
2 to <3 years	1.4 (1.4)	5.8 (6.0)		
3 to <6 years	1.4 (1.4)	5.8 (6.0)		
6 to <11 years	1.0 (1.0)	4.1 (4.2)		
11 to <16 years	0.71 (0.73)	3.0 (3.1)		
16 to <21 years	0.71 (0.73)	3.0 (3.1)		
21 to <50 years	0.65 (0.66)	2.7 (2.8)		
50+ years	0.51 (0.52)	2.1 (2.2)		
Home-Produced Dairy				
Per Capita for Populations That Farm or Raise Animals				
1 to <2 years	11 (13)	76 (92)	NA	Phillips and Moya (2012)
2 to <3 years	11 (13)	76 (92)		
3 to <6 years	6.7 (8.3)	48 (58)		
6 to <11 years	3.9 (4.8)	28 (34)		
11 to <16 years	1.6 (2.0)	12 (14)		
16 to <21 years	1.6 (2.0)	12 (14)		
21 to <50 years	0.95 (1.2)	6.9 (8.3)		
50+ years	0.92 (1.1)	6.7 (8.0)		
Home-Caught Fish				
Consumers Only, Unadjusted[b]				
1 to 2 years	-[d]	-	See Table 13-20	U.S. EPA Analysis of 1987–1988 NFCS
3 to 5 years	-	-		
6 to 11 years	2.8	7.1		
12 to 19 years	1.5	4.7		
20 to 39 years	1.9	4.5		
40 to 69 years	1.8	4.4		
≥70 years	1.2	3.7		

[a] Analysis was conducted prior to Agency's issuance of *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).
[b] Not adjusted to account for preparation or post-cooking losses.
[c] Adjusted for preparation and post-cooking losses.
[d] Data not presented for age groups/food groups where less than 20 observations were available.
NA = Not available.

Table 13-2. Confidence in Recommendations for Intake of Home-Produced Foods

General Assessment Factors	Rationale	Rating
Soundness		Medium (Means) Low (Distributions)
Adequacy of Approach	The NFCS survey methodology and the approach to data analysis were adequate, but individual intakes were inferred from household consumption data. The sample size was large (approximately 10,000 individuals).	
Minimal (or Defined) Bias	Non-response bias cannot be ruled out due to low response rate. Also, some biases may have occurred from using household data to estimate individual intake.	
Applicability and Utility		Low (Means and short-term distributions) Low (Long-term distributions)
Exposure Factor of Interest	The U.S. EPA analysis of the NFCS data specifically addressed home-produced intake.	
Representativeness	Data from a nationwide survey, representative of the general U.S. population was used.	
Currency	The data were collected in 1987–1988.	
Data Collection Period	Household data were collected over 1 week.	
Clarity and Completeness		High
Accessibility	The methods used to analyze the data are described in detail in this handbook; the primary data are accessible through USDA.	
Reproducibility	Sufficient details on the methods used to analyze the data are presented to allow the results to be reproduced.	
Quality Assurance	Quality assurance of NFCS data was good; quality control of the secondary data was sufficient.	
Variability and Uncertainty		Low to Medium
Variability in Population	Full distributions of home-produced intake rates were provided in the NFCS analysis. Phillips and Moya (2012) presented mean and 95th percentile values.	
Uncertainty	Sources of uncertainty include: individuals' estimates of food weights, allocation of household food to family members, and potential changes in eating patterns since these data were collected.	
Evaluation and Review		Medium
Peer Review	The study was reviewed by USDA and EPA.	
Number and Agreement of Studies	There was one key study that described the primary analysis of NFCS data and 1 key study that described a secondary analysis of the NFCS home-produced data.	
Overall Rating		**Low to Medium** (Means and short-term distributions) **Low** (Long-term distributions)

13.3. KEY STUDY FOR INTAKE OF HOME-PRODUCED FOODS

13.3.1. U.S. EPA Analysis of NFCS 1987–1988; Moya and Phillips (2001) Analysis of Consumption of Home-Produced Foods

U.S. EPA's National Center for Environmental Assessment (NCEA) analyzed USDA's 1987–1988 NFCS data to generate intake rates for home-produced foods. In addition, Moya and Phillips (2001) present a summary of these analyses. For the purposes of this study, home-produced foods were defined as home-produced fruits and vegetables, meat and dairy products derived from consumer-raised livestock or game meat, and home-caught fish.

Until 1988, USDA conducted the NFCS every 10 years to analyze the food consumption behavior and dietary status of Americans (USDA, 1992). While more recent food consumption surveys have been conducted to estimate food intake among the general population (e.g., USDA's Continuing Survey of Food Intake by Individuals [CSFII] and the National Health and Nutrition Examination Survey [NHANES]), these surveys have not collected data that can be used to estimate consumption of home-produced foods. Thus, the 1987–1988 NFCS data set is currently the best available source of information for this factor.

The 1987–1988 NFCS was conducted between April 1987 and August 1988. The survey used a statistical sampling technique designed to ensure that all seasons, geographic regions of the 48 conterminous states in the United States, and socioeconomic and demographic groups were represented (USDA, 1994). There were two components of the NFCS. The household component collected information over a 7-day period on the socioeconomic and demographic characteristics of households, as well as the types, amount, value, and sources of foods consumed by the household (USDA, 1994). Meanwhile, the individual intake component collected information on food intakes of individuals within each household over a 3-day period (USDA, 1993). The sample size for the 1987–1988 survey was approximately 4,300 households (more than 10,000 individuals; approximately 3,000 children). This was a decrease from the previous survey conducted in 1977–1978, which sampled approximately 15,000 households (more than 36,000 individuals) (USDA, 1994). The sample size was lower in the 1987–1988 survey as a result of budgetary constraints and low response rate [38% for the household survey and 31% for the individual survey; USDA (1993)].

The USDA data were adjusted by applying sample weights calculated by USDA to the data set prior to analysis. The USDA sample weights were designed to "adjust for survey non-response and other vagaries of the sample selection process" (USDA, 1988). Also, the USDA weights are calculated "so that the weighted sample total equals the known population total, in thousands, for several characteristics thought to be correlated with eating behavior" (USDA, 1988).

The food groups selected for analysis of home-produced food intake included major food groups (i.e., total fruits, total vegetables, total meats, total dairy, total fish and shellfish) and individual food items for which greater than 30 households reported eating the home-produced form of the item; fruits and vegetables categorized as exposed, protected, and roots; and various USDA fruit and vegetable subcategories (e.g., dark green vegetables, citrus fruits). These food groups were identified in the NFCS data base according to NFCS-defined food codes. Appendix 13A presents the codes and definitions used to determine the major food groups. Foods with these codes, for which the source was identified as home-produced, were included in the analysis. The codes and definitions for individual items in these food groups, as well as other subcategories (e.g., exposed, protected, dark green, citrus) considered to be home-produced are in Appendix 13B.

Although the individual intake component of the NFCS gives the best measure of the amount of each food group eaten by each individual in the household, it could not be used directly to measure consumption of home-produced food because the individual component does not identify the source of the food item (i.e., as home-produced or not). Therefore, an analytical method that incorporated data from both the household and individual survey components was developed to estimate individual home-produced food intake.

The household data were used to determine (1) the amount of each home-produced food items used during a week by household members, and (2) the number of meals eaten in the household by each household member during a week. Note that the household survey reports the total amount of each food item used in the household (whether by guests or household members); the amount used by household members was derived by multiplying the total amount used in the household by the proportion of all meals served in the household (during the survey week) that were consumed by household members. The individual survey data were used to generate average sex- and age-specific serving sizes for each food item. The age categories used in the

analysis were as follows: 1 to 2 years, 3 to 5 years, 6 to 11 years, 12 to 19 years, 20 to 39 years, 40 to 69 years, and 70 years and older (intake rates were not calculated for children under 1 year of age; the rationale for this is discussed after equation 13-1). The serving sizes were used during subsequent analyses to generate home-produced food intake rates for individual household members. Assuming that the proportion of the household quantity of each home-produced food item/group was a function of the number of meals and the mean sex- and age-specific serving size for each family member, individual intakes of home-produced food were calculated for all members of the survey population using the following general equation:

$$w_i = w_f \left[\frac{m_i q_i}{\sum_{i=1}^{n} m_i q_i} \right] \qquad \text{(Eqn. 13-1)}$$

where:

w_i = Home-produced amount of food item/group attributed to member *i* during the week (g/week),

w_f = Total quantity of home-produced food item/group used by the family members (g/week),

m_i = Number of meals of household food consumed by member *i* during the week (meals/week), and

q_i = Serving size for an individual within the age and sex category of the member (g/meal).

Daily intake of a home-produced food group was determined by dividing the weekly value (w_i) by 7. Intake rates were indexed to the self-reported body weight of the survey respondent and reported in units of g/kg-day. Intake rates were not calculated for children less than 1 year of age because their diet differs markedly from that of other household members, and, thus, the assumption that all members share all foods would be invalid for this age group.

For the major food groups (i.e., fruits, vegetables, meats, dairy, and fish) and individual foods consumed by at least 30 households, distributions of home-produced intake among consumers were generated for the entire data set and for the following subcategories: age groups, urbanization categories, seasons, racial classifications, regions, and responses to a questionnaire.

Consumers were defined as members of survey households who reported consumption of the food item/group of interest during the 1-week survey period.

In addition, for the major food groups, distributions were generated for each region by season, urbanization, and responses to the questionnaire. Table 13-3 presents the codes, definitions, and a description of the data included in each of the subcategories. Intake rates were not calculated for food items/groups for which less than 30 households reported home-produced usage because the number of observations may be inadequate for generating distributions that would be representative of that segment of consumers. Fruits and vegetables were also classified as exposed, protected, or roots, as shown in Appendix 13B. *Exposed foods* are those that are grown above ground and are likely to be contaminated by pollutants deposited on surfaces of the foods that are eaten. *Protected products* are those that have outer protective coatings that are typically removed before consumption.

Distributions of intake were tabulated for these food classes for the same subcategories listed previously. Distributions were also tabulated for the following USDA food classifications: dark green vegetables, deep yellow vegetables, other vegetables, citrus fruits, and other fruits. Finally, the percentages of total intake of the food items/groups consumed within survey households that can be attributed to home production were tabulated. The percentage of intake that was home-produced was calculated as the ratio of total intake of the home-produced food item/group by the survey population to the total intake of all forms of the food by the survey population.

Percentiles of average daily intake derived from short-time intervals (e.g., 7 days) will not, in general, be reflective of long-term patterns. This is especially true in regards to consumption of many home-produced products (e.g., fruits, vegetables), where a strong seasonal component often is associated with their use. For the major food categories, to try to derive the long-term distribution of average daily intake rates from the short-term data available here, an approach was developed that attempted to account for seasonal variability in consumption. This approach used regional "seasonally adjusted distributions" to approximate regional long-term distributions and then combined these regional adjusted distributions (in proportion to

the weights for each region) to obtain a U.S. adjusted distribution that approximated the U.S. long-term distribution. See Moya and Phillips (2001) for details.

The percentiles of the seasonally adjusted distribution for a given region were generated by averaging the corresponding percentiles of each of the four seasonal distributions of the region. More formally, the seasonally adjusted distribution for each region is such that its inverse cumulative distribution function is the average of the inverse cumulative distribution functions of each of the seasonal distributions of that region. The use of regional seasonally adjusted distributions to approximate regional long-term distributions is based on the assumption that each individual consumes the same regional percentile levels for each season and consumes at a constant weekly rate throughout a given season. For instance, if the 60th percentile weekly intake level in the South is 14.0 grams in the summer and 7.0 grams in each of the three other seasons, then the individual in the South with an average weekly intake of 14.0 grams during the summer is assumed to have an intake of 14.0 grams for each week of the summer and an intake of 7.0 grams for each week of the other seasons.

Note that the seasonally adjusted distributions were generated using the overall distributions (i.e., both consumers and non-consumers). However, because all the other distributions presented in this section are based on consumers only, the percentiles for the adjusted distributions have been revised to reflect the percentiles among consumers only. Given the assumption about how each individual consumes, the percentage consuming for the seasonally adjusted distributions gives an estimate of the percentage of the population consuming the specified food category at any time during the year.

The intake data presented in this chapter for consumers of home-produced foods and the total number of individuals surveyed may be used to calculate the mean and the percentiles of the distribution of home-produced food consumption in the overall population (consumers and non-consumers) as follows:

Assuming that IR_p is the home-produced intake rate of the food group at the p^{th} percentile and N_c is the weighted number of individuals consuming the home-produced food item, and N_T is the weighted total number of individuals surveyed, then $N_T - N_c$ is the weighted number of individuals who reported zero consumption of the food item. In addition, there are $(p / 100 \times N_c)$ individuals below the p^{th} percentile. Therefore, the percentile that corresponds to a particular intake rate (IR_p) for the overall distribution of home-produced food consumption (including consumers and non-consumers) can be obtained by:

$$p^{th}_{overall} = 100 \times \frac{\left(\frac{p}{100} \times N_c + \left(N_T - N_c\right)\right)}{N_T} \quad \text{(Eqn. 13-2)}$$

For example, the percentile of the overall population that is equivalent to the 50th percentile consumer-only intake rate for home-produced fruits would be calculated as follows:

From Table 13-5, the 50th percentile home-produced fruit intake rate (IR_{50}) is 1.07 g/kg-day. The weighted number of individuals consuming fruits (N_c) is 14,744,000. From Table 13-4, the weighted total number of individuals surveyed (N_T) is 188,019,000. The number of individuals consuming fruits below the 50th percentile is

$p / 100 \times N_c = (0.5) \times (14{,}744{,}000)$
$= 7{,}372{,}000$

The number of individuals that did not consume fruit during the survey period is

$N_T - N_c = 188{,}019{,}000 - 14{,}744{,}000$
$= 173{,}275{,}000$

The total number of individuals with home-produced intake rates at or below 1.07 g/kg-day is

$(p / 100 \times N_c) + (N_T - N_c) = 7{,}372{,}000$
$+ 173{,}275{,}000$
$= 180{,}647{,}000$

The percentile of the overall population that is represented by this intake rate is

$p^{th}_{overall}$ $100 \times (180{,}647{,}000 / 188{,}019{,}000)$
96^{th} *percentile*

Therefore, an intake rate of 1.07 g/kg-day of home-produced fruit corresponds to the 96th percentile of the overall population.

Following this same procedure, 5.97 g/kg-day, which is the 90th percentile of the consumers-only population, corresponds to the 99th percentile of the overall population. Likewise, 0.063 g/kg-day, which is the 1st percentile of the consumers-only population, corresponds to the 92nd percentile of the overall population. Note that the consumers-only distribution corresponds to the tail of the distribution for the overall population. Consumption rates below the 92nd percentile are very close to zero. The mean intake rate for the overall population can be calculated by multiplying the mean intake rate among consumers by the proportion of individuals consuming the home-produced food item N_c / N_T.

Table 13-4 displays the weighted numbers N_T and the unweighted total survey sample sizes for each subcategory and overall. Note that the total unweighted number of observations in Table 13-4 (9,852) is somewhat lower than the number of observations reported by USDA; this study only used observations for family members for which age and body weight were specified.

The intake rate distributions (among consumers) for total home-produced fruits, vegetables, meats, fish, and dairy products are shown, respectively, in Table 13-5 through Table 13-29. These tables also show the proportion of respondents consuming the item during the (1-week) survey period. Home-produced vegetables were the most commonly consumed of the major food groups (18.3%), followed by fruit (7.8%), meat (4.9%), fish (2.1%), and dairy products (0.7%). The intake rates for the major food groups varied according to region, age, urbanization code, race, and responses to survey questions. In general, intake rates of home-produced foods were higher among populations in non-metropolitan and suburban areas and lowest in central city areas. Results of the regional analyses indicate that intake of home-produced fruits, vegetables, meat, and dairy products was generally highest for individuals in the Midwest and South regions and lowest for those in the Northeast region. Intake rates of home-caught fish were generally highest among consumers in the South. Home-produced intake was generally higher among individuals who indicated that they operate a farm, grow their own vegetables, raise animals, and catch their own fish. The results of the seasonal analyses for all regions combined indicate that, in general, home-produced fruits and vegetables were eaten at a higher rate in summer and home-caught fish was consumed at a higher rate in spring; however, seasonal intake varied based on individual regions. Table 13-30 presents seasonally adjusted intake rate distributions for the major food groups.

Table 13-31 through Table 13-57 show distributions of intake for individual home-produced food items for households that reported consuming the home-produced form of the food during the survey period. Intake rate distributions among consumers for home-produced foods categorized as exposed fruits and vegetables, protected fruits and vegetables, and root vegetables are presented in Table 13-58 through Table 13-62; the intake distributions for various USDA classifications (e.g., dark green vegetables) are presented in Table 13-63 through Table 13-67. The results are presented in units of g/kg-day. Table 13-68 presents the fraction of household intake attributed to home-produced forms of the food items/groups evaluated. Thus, use of these data in calculating potential dose does not require the body-weight factor to be included in the denominator of the average daily dose in equation 1-2 in Chapter 1. Note that converting these intake rates into units of g/day by multiplying by a single average body weight is inappropriate, because individual intake rates were indexed to the reported body weights of the survey respondents.

As mentioned previously, the intake rates derived in this section are based on the amount of household food consumption. As measured by the NFCS, the amount of food consumed by the household is a measure of consumption in an economic sense (i.e., a measure of the weight of food brought into the household that has been consumed [used up] in some manner). In addition to food being consumed by persons, food may be used up by spoiling, by being discarded (e.g., inedible parts), through cooking processes, and other methods.

USDA estimated preparation losses for various foods (USDA, 1975). For meats, a net cooking loss, which includes dripping and volatile losses, and a net post-cooking loss, which involves losses from cutting, bones, excess fat, scraps and juices, were derived for a variety of cuts and cooking methods. For each meat type, U.S. EPA has averaged these losses across all cuts and cooking methods to obtain a mean net cooking loss and a mean net post-cooking loss. Table 13-69 provides mean percentage values for all meats and fish. For individual fruits and vegetables, USDA (1975) also gave cooking and post-cooking losses. These data, averaged across all types of fruits and vegetables to give mean net cooking and post-cooking losses, also are provided in Table 13-69.

The formula presented in equation 13-3 can be used to convert the home-produced intake rates tabulated here to rates reflecting actual consumption:

$$I_A = I \times (1 - L_1) \times (1 - L_2) \qquad \text{(Eqn. 13-3)}$$

where:

I_A = the adjusted intake rate,
I = the tabulated intake rate,
L_1 = the cooking or preparation loss, and
L_2 = the post-cooking loss.

Corrections based on post-cooking losses only apply to fruits that are eaten in cooked forms. For raw forms of the fruits, paring or preparation loss data should be used to correct for losses from the removal of skin, peel, core, caps, pits, stems, and defects, or from the draining of liquids from canned or frozen forms. To obtain preparation losses for food categories, the preparation losses of the individual foods making up the category can be averaged.

In calculating ingestion exposure, assessors should use consistent forms (e.g., as consumed or dry weight) in combining intake rates with contaminant concentrations (see Chapter 9).

The USDA NFCS data set is the largest publicly available source of information on home-produced food consumption habits in the United States. The advantages of using this data set are that it is expected to be representative of the U.S. population and that it provides information on a wide variety of food groups. However, the data collected by the USDA NFCS are based on short-term dietary recall, and the intake distributions generated from this data set may not accurately reflect long-term intake patterns, particularly with the tails (extremes) of the distributions. Also, the two survey components (i.e., household and individual) do not define food items/groups in a consistent manner; as a result, some errors may be introduced into these analyses because the two survey components are linked. The results presented in this chapter also may be biased by assumptions that are inherent in the analytical method utilized. The analytical method may not capture all high-end consumers within households because average serving sizes are used in calculating the proportion of home-produced food consumed by each household member. Thus, for instance, in a two-person household in which one member had high intake and another had low intake, the method used would assume that both members had an equal and moderate level of intake. In addition, the analyses assume that all family members consume a portion of the home-produced food used within the household. However, not all family members may consume each home-produced food item, and serving sizes allocated in this instance may not be entirely representative of the portion of household foods consumed by each family member. As was mentioned earlier, no analyses were performed for children under 1 year of age.

The preparation loss factors discussed previously are intended to convert intake rates based on "household consumption" to rates reflective of what individuals actually consume. However, these factors do not include losses to spoilage, feeding to pets, food thrown away, and other methods. It also should be noted that because this analysis is based on the 1987–1988 NFCS, it may not reflect recent changes in food consumption patterns. The low response rate associated with the 1987–1988 NFCS also contributes to the uncertainty of the home-produced intake rates generated using these data.

13.3.2. Phillips and Moya (2012)—Estimation of Age-Specific Per Capita Home-Produced Food Intake Among Populations That Garden, Farm, or Raise Animals

Phillips and Moya (2012) used the consumer intake data for home-produced fruits, vegetables, meats, and dairy products from the analysis described in Section 13.3.1 to estimate per capita intake rates for the populations that garden, farm, or raise animals. The consumer-only intake values in Section 13.3.1 are based on short-term dietary survey data and may be appropriate for estimating short-term intake, but may over-estimate exposure over longer time periods. Also, the intake rates in Section 13.3.1 represent intake of foods brought into the household and have not been adjusted to account for preparation losses and post-cooking losses. Phillips and Moya (2012) converted the distribution of consumer-only intake rates for populations that garden, farm, and raise animals to the distribution of per capita rates using equation 13-2 and adjusted these data to account for preparation losses and post-cooking losses using equation 13-3. Data for households that garden, farm, or raise animals were used because they were assumed to represent both households who ate home-produced foods during the survey period as well as those who did not eat home-produced foods during the survey period, but may eat these foods at some other time during the year. Also, the data in Section 13.3.1 for the populations that garden, farm, or raise animals are not provided by age group, but represent data for all ages of the survey population combined. Phillips and Moya (2012) calculated age-specific intake rates using ratios of age-specific dietary intake to total population intake rates, based on survey data for intake of total fruits, vegetables,

meats, and dairy from all sources (i.e., both home-produced and commercial sources) from the 1994-1996, 1998 CSFII, as described in Chapters 9 and 11. The age groups used are those recommended in U.S. EPA (2005). Age-specific intake mean and 95th percentile intake rates were estimated as: age-specific ratio × mean (or 95th percentile) per capita intake for the total population, where the age-specific ratio = age-specific mean per capita total intake (g/kg-day)/ total population mean per capita total intake (g/kg-day). Table 13-70 provides the both the adjusted and unadjusted estimated mean and 95th per-capita intake rates for the total populations that garden, farm, and raise animals. Table 13-70 also provides age-specific per capita intake rates based on data that have been adjusted to account for preparation and post-cooking losses.

The advantages of this analysis are that it provides data for populations that may be of particular interest because they may represent the high-end of the per capita home-produced food intake distribution (Phillips and Moya, 2012), and that age-specific intake rates are provided for the age groups recommended by U.S. EPA (2005). However, it should be noted that these estimates are based on data that are more than 20 years old and may not reflect recent changes in consumption patterns. Also, the data for children less than 1 year of age are considered to be less certain than for other age groups because the diets of children in this age range would be expected to be highly variable (Phillips and Moya, 2012). Other limitations associated with this analysis are the same as those described in Section 13.3.1 for the analysis of the NFCS data.

13.4. RELEVANT STUDY FOR INTAKE OF HOME-PRODUCED FOODS

13.4.1. National Gardening Association (2009)

According to a survey by the National Gardening Association (2009), an estimated 36 million (or 31%) of U.S. households participated in food gardening in 2008. Food gardening includes growing vegetables, berries, fruit, and herbs. Of the estimated 36 million food-gardening households, 23% participated in vegetable gardening, 12% participated in herb gardening, 10% participated in growing fruit trees, and 6% grew berries. Table 13-71 contains demographic data on food gardening in 2008 by sex, age, education, household income, and household size. Table 13-72 contains information on the types of vegetables grown by home gardeners in 2008. Tomatoes, cucumbers, peppers, beans, carrots, summer squash, onions, lettuce, peas, and corn are among the vegetables grown by the largest percentage of gardeners.

13.5. REFERENCES FOR CHAPTER 13

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Table 13-3. Subcategory Codes, Definitions, and Descriptions

Code	Definition	Description
		Region[a]
1	Northeast	Includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.
2	Midwest	Includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.
3	South	Includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.
4	West	Includes Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
		Urbanization
1	Central City	Cities with populations of 50,000 or more that is the main city within the metropolitan statistical area (MSA).
2	Suburban	An area that is generally within the boundaries of an MSA but is not within the legal limit of the central city.
3	Non-metropolitan	An area that is not within an MSA.
		Race
1	--	White (Caucasian)
2	--	Black
3	--	Asian and Pacific Islander
4	--	Native American, Aleuts, and Eskimos
5, 8, 9	Other/NA	Don't know, no answer, some other race
		Responses to Survey Questions
Grow	Question 75	Did anyone in the household grow any vegetables or fruit for use in the household?
Raise Animals	Question 76	Did anyone in the household produce any animal products such as milk, eggs, meat, or poultry for home use in your household?
Fish/Hunt	Question 77	Did anyone in the household catch any fish or shoot game for home use?
Farm	Question 79	Did anyone in the household operate a farm or ranch?
		Season
Spring	-	April, May, June
Summer	-	July, August, September
Fall	-	October, November, December
Winter	-	January, February, March

[a] Alaska and Hawaii were not included.
Source: USDA (1988).

Table 13-4. Weighted and Unweighted Number of Observations (Individuals) for NFCS Data Used in Analysis of Food Intake

	All Regions		Northeast		Midwest		South		West	
	wgtd	unwgtd	wgtd	unwgtd	wgtd	unwgtd	wgtd	unwgtd	wgtd	unwgtd
Total	188,019,000	9,852	41,167,000	2,018	46,395,000	2,592	64,331,000	3,399	36,066,000	1,841
Age (years)										
< 1	2,814,000	156	545,000	29	812,000	44	889,000	51	568,000	32
1 to 2	5,699,000	321	1,070,000	56	1,757,000	101	1,792,000	105	1,080,000	59
3 to 5	8,103,000	461	1,490,000	92	2,251,000	133	2,543,000	140	1,789,000	95
6 to 11	16,711,000	937	3,589,000	185	4,263,000	263	5,217,000	284	3,612,000	204
12 to 19	20,488,000	1,084	4,445,000	210	5,490,000	310	6,720,000	369	3,833,000	195
20 to 39	61,606,000	3,058	12,699,000	600	15,627,000	823	21,786,000	1,070	11,494,000	565
40 to 69	56,718,000	3,039	13,500,000	670	13,006,000	740	19,635,000	1,080	10,577,000	549
≥ 70	15,880,000	796	3,829,000	176	3,189,000	178	5,749,000	300	3,113,000	142
Season										
Fall	47,667,000	1,577	9,386,000	277	14,399,000	496	13,186,000	439	10,696,000	365
Spring	46,155,000	3,954	10,538,000	803	10,657,000	1,026	16,802,000	1,437	8,158,000	688
Summer	45,485,000	1,423	9,460,000	275	10,227,000	338	17,752,000	562	7,986,000	246
Winter	48,712,000	2,898	11,783,000	663	11,112,000	732	16,591,000	961	9,226,000	542
Urbanization										
Central City	56,352,000	2,217	9,668,000	332	17,397,000	681	17,245,000	715	12,042,000	489
Non-metropolitan	45,023,000	3,001	5,521,000	369	14,296,000	1,053	19,100,000	1,197	6,106,000	382
Suburban	86,584,000	4,632	25,978,000	1,317	14,702,000	858	27,986,000	1,487	17,918,000	970
Race										
Asian	2,413,000	114	333,000	13	849,000	37	654,000	32	577,000	32
Black	21,746,000	1,116	3,542,000	132	2,794,000	126	13,701,000	772	1,709,000	86
Native American	1,482,000	91	38,000	4	116,000	6	162,000	8	1,166,000	73
Other/NA	4,787,000	235	1,084,000	51	966,000	37	1,545,000	86	1,192,000	61
White	157,531,000	8,294	36,170,000	1,818	41,670,000	2,386	48,269,000	2,501	31,422,000	1,589
Response to Questionnaire										
Do you garden?	6,8152,000	3,744	12,501,000	667	22,348,000	1,272	20,518,000	1,136	12,725,000	667
Do you raise animals?	10,097,000	631	1,178,000	70	3,742,000	247	2,603,000	162	2,574,000	152
Do you hunt?	20,216,000	1,148	3,418,000	194	6,948,000	411	6,610,000	366	3,240,000	177
Do you fish?	39,733,000	2,194	5,950,000	321	12,621,000	725	13,595,000	756	7,567,000	392
Do you farm?	7,329,000	435	830,000	42	2,681,000	173	2,232,000	130	1,586,000	90

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-5. Consumer-Only Intake of Home-Produced Fruits (g/kg-day)—All Regions Combined

Population Group	Nc wgtd	Nc Unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	14,744,000	817	7.84	2.68	0.19	0.06	0.17	0.28	0.50	1.07	2.37	5.97	11.10	24.00	60.60
Age (years)															
1 to 2	360,000	23	6.32	8.74	3.10	0.96	1.09	1.30	1.64	3.48	7.98	19.30	60.60	60.60	60.60
3 to 5	550,000	34	6.79	4.07	1.48	0.01	0.01	0.36	0.98	1.92	2.73	6.02	8.91	48.30	48.30
6 to 11	1,044,000	75	6.25	3.59	0.68	0.01	0.19	0.40	0.70	1.31	3.08	11.80	15.80	32.20	32.20
12 to 19	1,189,000	67	5.80	1.94	0.37	0.09	0.13	0.27	0.44	0.66	2.35	6.76	8.34	18.50	18.50
20 to 39	3,163,000	164	5.13	1.95	0.33	0.08	0.13	0.20	0.37	0.70	1.77	4.17	6.84	16.10	37.00
40 to 69	5,633,000	309	9.93	2.66	0.30	0.06	0.19	0.29	0.47	1.03	2.33	5.81	13.00	23.80	53.30
≥ 70	2,620,000	134	16.50	2.25	0.23	0.04	0.22	0.38	0.61	1.18	2.35	5.21	8.69	11.70	15.30
Season															
Fall	3,137,000	108	6.58	1.57	0.16	0.26	0.30	0.39	0.57	1.04	1.92	3.48	4.97	10.60	10.60
Spring	2,963,000	301	6.42	1.58	0.14	0.09	0.20	0.25	0.42	0.86	1.70	4.07	5.10	8.12	31.70
Summer	4,356,000	145	9.58	3.86	0.64	0.01	0.09	0.16	0.45	1.26	3.31	10.90	14.60	53.30	60.60
Winter	4,288,000	263	8.80	3.08	0.34	0.04	0.17	0.27	0.56	1.15	2.61	8.04	15.30	24.90	48.30
Urbanization															
Central City	3,668,000	143	6.51	2.31	0.26	0.04	0.18	0.33	0.57	1.08	2.46	5.34	10.50	14.30	19.30
Non-metropolitan	4,118,000	278	9.15	2.41	0.31	0.06	0.13	0.23	0.45	1.15	2.42	4.46	8.34	24.00	53.30
Suburban	6,898,000	394	7.97	3.07	0.32	0.13	0.23	0.30	0.49	0.99	2.33	7.26	15.20	37.00	60.60
Race															
Black	450,000	20	2.07	1.87	0.85	0.13	0.28	0.46	0.61	1.13	1.53	2.29	2.29	19.30	19.30
White	14,185,000	793	9.00	2.73	0.19	0.07	0.18	0.28	0.51	1.07	2.46	6.10	11.70	24.00	60.60
Response to Questionnaire															
Households who garden	12,742,000	709	18.70	2.79	0.21	0.06	0.18	0.29	0.53	1.12	2.50	6.10	11.80	24.90	60.60
Households who farm	1,917,000	112	26.16	2.58	0.26	0.07	0.28	0.41	0.75	1.61	3.62	5.97	7.82	15.80	15.80

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Moya and Phillips (2001). (Based on EPA's analyses of the 1987–1988 NFCS.)

Table 13-6. Consumer-Only Intake of Home-Produced Fruits (g/kg-day)—Northeast

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,279,000	72	3.11	0.93	0.22	0.08	0.08	0.16	0.31	0.49	0.78	1.29	2.16	11.70	11.70
Season															
Fall	260,000	8	2.77	*	*	*	*	*	*	*	*	*	*	*	*
Spring	352,000	31	3.34	0.88	0.23	0.09	0.16	0.17	0.29	0.49	0.88	1.83	2.16	7.13	7.13
Summer	271,000	9	2.86	*	*	*	*	*	*	*	*	*	*	*	*
Winter	396,000	24	3.36	0.71	0.11	0.18	0.21	0.23	0.29	0.54	0.88	1.38	1.79	2.75	2.75
Urbanization															
Central City	50,000	3	0.52	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	176,000	10	3.19	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	1,053,000	59	4.05	1.05	0.26	0.18	0.23	0.29	0.44	0.54	0.81	1.29	2.75	11.70	11.70
Response to Questionnaire															
Households who garden	983,000	59	7.86	1.04	0.26	0.09	0.18	0.21	0.38	0.54	0.88	1.38	2.75	11.70	11.70
Households who farm	132,000	4	15.90	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-7. Consumer-Only Intake of Home-Produced Fruits (g/kg-day)—Midwest

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,683,000	302	10.09	3.01	0.41	0.04	0.13	0.24	0.47	1.03	2.31	6.76	13.90	53.30	60.60
Season															
Fall	1,138,000	43	7.90	1.54	0.19	0.26	0.30	0.47	0.61	1.07	1.92	3.48	4.34	5.33	5.33
Spring	1,154,000	133	10.83	1.69	0.28	0.09	0.21	0.26	0.42	0.92	1.72	2.89	4.47	16.00	31.70
Summer	1,299,000	44	12.70	7.03	1.85	0.06	0.09	0.13	0.43	1.55	8.34	16.10	37.00	60.60	60.60
Winter	1,092,000	82	9.83	1.18	0.18	0.03	0.06	0.15	0.36	0.61	1.42	2.61	3.73	10.90	10.90
Urbanization															
Central City	1,058,000	42	6.08	1.84	0.39	0.04	0.10	0.26	0.52	1.07	1.90	2.82	9.74	10.90	10.90
Non-metropolitan	1,920,000	147	13.43	2.52	0.54	0.06	0.11	0.15	0.40	1.03	2.07	4.43	6.84	53.30	53.30
Suburban	1,705,000	113	11.60	4.29	0.87	0.09	0.20	0.31	0.48	0.76	3.01	13.90	18.00	60.60	60.60
Response to Questionnaire															
Households who garden	4,060,000	267	18.17	3.27	0.47	0.04	0.10	0.20	0.45	1.07	2.37	7.15	14.60	53.30	60.60
Households who farm	694,000	57	25.89	2.59	0.30	0.06	0.19	0.41	1.26	1.63	3.89	6.76	8.34	11.10	11.10

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-8. Consumer-Only Intake of Home-Produced Fruits (g/kg-day)—South

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,148,000	208	6.45	2.97	0.30	0.11	0.24	0.36	0.60	1.35	3.01	8.18	14.10	23.80	24.00
Season															
Fall	896,000	29	6.80	1.99	0.44	0.39	0.43	0.45	0.65	1.13	1.96	4.97	8.18	10.60	10.60
Spring	620,000	59	3.69	2.05	0.26	0.16	0.28	0.31	0.45	1.06	4.09	5.01	6.58	7.05	7.05
Summer	1,328,000	46	7.48	2.84	0.65	0.08	0.16	0.27	0.44	1.31	2.83	6.10	14.30	24.00	24.00
Winter	1,304,000	74	7.86	4.21	0.65	0.11	0.24	0.38	0.89	1.88	3.71	14.10	19.70	23.80	23.80
Urbanization															
Central City	1,066,000	39	6.18	3.33	0.54	0.24	0.39	0.46	0.83	2.55	4.77	8.18	10.60	14.30	14.30
Non-metropolitan	1,548,000	89	8.10	2.56	0.39	0.08	0.27	0.34	0.61	1.40	2.83	5.97	10.40	24.00	24.00
Suburban	1,534,000	80	5.48	3.14	0.60	0.11	0.16	0.28	0.51	1.10	2.29	11.80	15.50	23.80	23.80
Response to Questionnaire															
Households who garden	3,469,000	174	16.91	2.82	0.29	0.16	0.28	0.38	0.65	1.39	2.94	6.10	14.10	21.10	24.00
Households who farm	296,000	16	13.26	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-9. Consumer-Only Intake of Home-Produced Fruits (g/kg-day)—West

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,574,000	233	12.68	2.62	0.31	0.15	0.28	0.33	0.62	1.20	2.42	5.39	10.90	24.90	48.30
Season															
Fall	843,000	28	7.88	1.47	0.25	0.29	0.29	0.30	0.48	1.04	2.15	2.99	4.65	5.39	5.39
Spring	837,000	78	10.26	1.37	0.16	0.17	0.20	0.25	0.51	0.98	1.61	2.95	5.29	6.68	7.02
Summer	1,398,000	44	17.51	2.47	0.47	0.19	0.28	0.40	0.62	1.28	3.14	7.26	10.90	13.00	13.00
Winter	1,496,000	83	16.22	4.10	0.79	0.07	0.30	0.33	0.77	1.51	3.74	11.10	18.50	48.30	48.30
Urbanization															
Central City	1,494,000	59	12.41	1.99	0.42	0.07	0.24	0.34	0.53	0.86	2.04	4.63	9.52	19.30	19.30
Non-metropolitan	474,000	32	7.76	2.24	0.53	0.18	0.28	0.42	0.63	0.77	2.64	4.25	10.90	10.90	10.90
Suburban	2,606,000	142	14.54	3.04	0.46	0.18	0.28	0.31	0.71	1.39	3.14	5.81	10.30	32.20	48.30
Response to Questionnaire															
Households who garden	4,170,000	207	32.77	2.76	0.34	0.10	0.28	0.31	0.63	1.20	2.54	5.81	10.90	24.90	48.30
Households who farm	795,000	35	50.13	1.85	0.26	0.28	0.28	0.60	0.71	1.26	2.50	4.63	5.00	6.81	6.81

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-10. Consumer-Only Intake of Home-Produced Vegetables (g/kg-day)—All Regions Combined

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	34,392,000	1,855	18.29	2.08	0.07	0.00	0.11	0.18	0.45	1.11	2.47	5.20	7.54	15.50	27.00
Age															
1 to 2	951,000	53	16.69	5.20	0.85	0.02	0.25	0.38	1.23	3.27	5.83	13.10	19.60	27.00	27.00
3 to 5	1,235,000	76	15.24	2.46	0.28	0.00	0.05	0.39	0.71	1.25	3.91	6.35	7.74	10.60	12.80
6 to 11	3,024,000	171	18.10	2.02	0.25	0.01	0.10	0.16	0.40	0.89	2.21	4.64	6.16	17.60	23.60
12 to 19	3,293,000	183	16.07	1.48	0.14	0.00	0.06	0.15	0.32	0.81	1.83	3.71	6.03	7.71	9.04
20 to 39	8,593,000	437	13.95	1.47	0.10	0.02	0.08	0.16	0.27	0.76	1.91	3.44	4.92	10.50	20.60
40 to 69	12,828,000	700	22.62	2.07	0.10	0.01	0.12	0.21	0.53	1.18	2.47	5.12	6.94	14.90	22.90
≥ 70	4,002,000	211	25.20	2.51	0.19	0.01	0.15	0.24	0.58	1.37	3.69	6.35	8.20	12.50	15.50
Season															
Fall	11,026,000	394	23.13	1.88	0.13	0.05	0.11	0.18	0.41	0.98	2.11	4.88	6.94	12.50	18.90
Spring	6,540,000	661	14.17	1.36	0.07	0.00	0.04	0.14	0.32	0.70	1.63	3.37	5.21	8.35	23.60
Summer	11,081,000	375	24.36	2.86	0.19	0.07	0.16	0.22	0.71	1.62	3.44	6.99	9.75	18.70	27.00
Winter	5,745,000	425	11.79	1.79	0.11	0.00	0.04	0.16	0.47	1.05	2.27	3.85	6.01	10.60	20.60
Urbanization															
Central City	6,183,000	228	10.97	1.40	0.12	0.01	0.07	0.15	0.30	0.75	1.67	3.83	4.67	9.96	16.60
Non-metropolitan	13,808,000	878	30.67	2.68	0.12	0.02	0.16	0.26	0.60	1.45	3.27	6.35	9.33	17.50	27.00
Suburban	14,341,000	747	16.56	1.82	0.09	0.00	0.11	0.16	0.39	0.96	2.18	4.32	6.78	12.50	20.60
Race															
Black	1,872,000	111	8.61	1.78	0.23	0.00	0.08	0.14	0.44	0.93	2.06	4.68	5.70	8.20	18.90
White	31,917,000	1,714	20.26	2.10	0.07	0.01	0.11	0.18	0.45	1.12	2.48	5.18	7.68	15.50	27.00
Response to Questionnaire															
Households who garden	30,217,000	1,643	44.34	2.17	0.07	0.01	0.11	0.19	0.48	1.18	2.68	5.35	7.72	15.50	23.60
Households who farm	4,319,000	262	58.93	3.29	0.25	0.00	0.16	0.29	0.85	1.67	3.61	8.88	11.80	17.60	23.60

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Moya and Phillips (2001). (Based on EPA's analyses of the 1987–1988 NCFS.)

Table 13-11. Consumer-Only Intake of Home-Produced Vegetables (g/kg-day)—Northeast

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,883,000	236	11.86	1.78	0.17	0.00	0.08	0.14	0.28	0.75	1.89	6.03	7.82	12.70	14.90
Season															
Fall	1,396,000	41	14.87	1.49	0.41	0.08	0.13	0.17	0.27	0.58	1.17	6.64	9.97	10.20	10.20
Spring	1,204,000	102	11.43	0.82	0.11	0.00	0.00	0.04	0.17	0.46	0.95	2.26	3.11	6.52	6.78
Summer	1,544,000	48	16.32	2.83	0.47	0.11	0.15	0.16	0.74	1.29	3.63	7.82	9.75	14.90	14.90
Winter	739,000	45	6.27	1.67	0.27	0.00	0.00	0.09	0.26	1.25	2.77	3.63	6.10	8.44	8.44
Urbanization															
Central City	380,000	14	3.93	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	787,000	48	14.25	3.05	0.54	0.00	0.05	0.11	0.20	2.18	4.61	9.04	12.70	14.90	14.90
Suburban	3,716,000	174	14.30	1.59	0.17	0.00	0.08	0.14	0.28	0.72	1.64	4.82	6.80	10.20	10.20
Response to Questionnaire															
Households who garden	4,381,000	211	35.05	1.92	0.18	0.00	0.08	0.14	0.31	0.88	2.18	6.16	7.82	12.70	14.90
Households who farm	352,000	19	42.41	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-12. Consumer-Only Intake of Home-Produced Vegetables (g/kg-day)—Midwest

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	12,160,000	699	26.21	2.26	0.12	0.02	0.08	0.18	0.49	1.15	2.58	5.64	7.74	17.50	23.60
Season															
Fall	4,914,000	180	34.13	1.84	0.18	0.01	0.07	0.16	0.42	1.03	2.10	5.27	6.88	13.10	13.10
Spring	2,048,000	246	19.22	1.65	0.15	0.06	0.15	0.22	0.46	0.91	1.72	4.49	5.83	12.80	23.60
Summer	3,319,000	115	32.45	3.38	0.39	0.11	0.16	0.30	0.85	2.07	3.94	7.72	14.00	19.60	22.90
Winter	1,879,000	158	16.91	2.05	0.26	0.00	0.02	0.07	0.36	0.88	2.13	5.32	7.83	16.70	20.60
Urbanization															
Central City	3,177,000	113	18.26	1.36	0.19	0.00	0.06	0.11	0.25	0.71	1.67	3.94	5.50	9.96	16.60
Non-metropolitan	5,344,000	379	37.38	2.73	0.19	0.02	0.11	0.26	0.60	1.31	3.15	7.19	10.60	17.50	23.60
Suburban	3,639,000	207	24.75	2.35	0.22	0.03	0.15	0.22	0.64	1.39	2.75	4.87	7.18	19.60	20.60
Response to Questionnaire															
Households who garden	10,927,000	632	48.89	2.33	0.13	0.02	0.10	0.18	0.50	1.18	2.74	5.81	7.75	16.70	23.60
Households who farm	1,401,000	104	52.26	3.97	0.43	0.14	0.34	0.55	0.87	2.18	5.24	10.60	14.40	17.50	23.60

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-13. Consumer-Only Intake of Home-Produced Vegetables (g/kg-day)—South

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	11,254,000	618	17.49	2.19	0.12	0.03	0.16	0.24	0.56	1.24	2.69	4.92	7.43	17.00	27.00
Season															
Fall	2,875,000	101	21.80	2.07	0.28	0.10	0.11	0.19	0.52	1.14	2.69	4.48	6.02	15.50	18.90
Spring	2,096,000	214	12.47	1.55	0.11	0.01	0.09	0.26	0.53	0.94	2.07	3.58	4.81	8.35	10.30
Summer	4,273,000	151	24.07	2.73	0.32	0.11	0.17	0.25	0.62	1.54	3.15	5.99	9.70	23.60	27.00
Winter	2,010,000	152	12.12	1.88	0.14	0.00	0.16	0.35	0.64	1.37	2.69	3.79	5.35	7.47	8.36
Urbanization															
Central City	1,144,000	45	6.63	1.10	0.16	0.01	0.10	0.15	0.26	0.62	1.37	2.79	3.70	4.21	4.58
Non-metropolitan	6,565,000	386	34.37	2.78	0.18	0.05	0.22	0.35	0.71	1.66	3.31	5.99	9.56	18.90	27.00
Suburban	3,545,000	187	12.67	1.44	0.11	0.00	0.11	0.20	0.40	0.93	1.72	3.61	5.26	8.20	8.20
Response to Questionnaire															
Households who garden	9,447,000	522	46.04	2.27	0.12	0.03	0.16	0.26	0.61	1.37	3.02	5.18	7.43	15.50	23.60
Households who farm	1,609,000	91	72.09	3.34	0.46	0.00	0.13	0.23	1.03	1.72	3.15	9.56	11.80	23.60	23.60

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-14. Consumer-Only Intake of Home-Produced Vegetables (g/kg-day)—West

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	6,035,000	300	16.73	1.81	0.14	0.01	0.10	0.17	0.38	0.90	2.21	4.64	6.21	11.40	15.50
Season															
Fall	1,841,000	72	17.21	2.01	0.29	0.10	0.15	0.20	0.48	1.21	2.21	4.85	7.72	12.50	12.50
Spring	1,192,000	99	14.61	1.06	0.17	0.00	0.01	0.05	0.20	0.36	0.91	3.37	5.54	8.60	8.60
Summer	1,885,000	59	23.6	2.39	0.37	0.07	0.10	0.25	0.55	1.37	3.23	4.67	8.36	15.50	15.50
Winter	1,117,000	70	12.11	1.28	0.17	0.01	0.15	0.20	0.48	0.77	1.43	2.81	5.12	7.57	7.98
Urbanization															
Central City	1,482,000	56	12.31	1.80	0.28	0.03	0.07	0.16	0.48	1.10	2.95	4.64	4.85	11.40	11.40
Non-metropolitan	1,112,000	65	18.21	1.52	0.22	0.00	0.01	0.20	0.27	0.68	2.13	4.13	5.12	8.16	8.16
Suburban	3,441,000	179	19.20	1.90	0.20	0.01	0.10	0.15	0.39	0.93	2.20	4.63	7.98	12.50	15.50
Response to Questionnaire															
Households who garden	5,402,000	276	42.45	1.91	0.00	0.01	0.10	0.17	0.43	1.07	2.37	4.67	6.21	12.50	15.50
Households who farm	957,000	48	60.34	2.73	0.00	0.12	0.41	0.47	0.77	1.42	3.27	6.94	10.90	15.50	15.50

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-15. Consumer-Only Intake of Home-Produced Meats (g/kg-day)—All Regions Combined

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	9,257,000	569	4.92	2.21	0.11	0.12	0.24	0.37	0.66	1.39	2.89	4.89	6.78	14.00	23.20
Age															
1 to 2	276,000	22	4.84	3.65	0.61	0.39	0.95	0.95	1.19	2.66	4.72	8.68	10.00	11.50	11.50
3 to 5	396,000	26	4.89	3.61	0.51	0.80	0.80	1.51	2.17	2.82	3.72	7.84	9.13	13.00	13.00
6 to 11	1,064,000	65	6.37	3.65	0.45	0.37	0.65	0.72	1.28	2.09	4.71	8.00	14.00	15.30	15.30
12 to 19	1,272,000	78	6.21	1.70	0.17	0.19	0.32	0.47	0.62	1.23	2.35	3.66	4.34	6.78	7.51
20 to 39	2,732,000	158	4.43	1.82	0.15	0.12	0.19	0.30	0.53	1.11	2.65	4.52	6.23	9.17	10.90
40 to 69	2,872,000	179	5.06	1.72	0.11	0.02	0.21	0.34	0.58	1.17	2.38	3.67	5.16	5.90	7.46
≥ 70	441,000	28	2.78	1.39	0.23	0.09	0.09	0.13	0.55	1.01	1.81	2.82	3.48	7.41	7.41
Season															
Fall	2,852,000	107	5.98	1.57	0.14	0.12	0.21	0.35	0.52	1.11	2.27	3.19	4.41	6.78	7.84
Spring	1,726,000	197	3.74	2.37	0.15	0.24	0.32	0.45	0.78	1.69	3.48	5.00	6.67	10.10	13.00
Summer	2,368,000	89	5.21	3.10	0.38	0.02	0.19	0.41	0.85	1.77	4.34	7.01	10.50	22.30	22.30
Winter	2,311,000	176	4.74	1.98	0.17	0.14	0.24	0.37	0.65	1.33	2.43	3.96	6.40	10.90	23.20
Urbanization															
Central City	736,000	28	1.31	1.15	0.18	0.18	0.19	0.21	0.44	0.72	1.58	2.69	3.40	3.64	3.64
Non-metropolitan	4,932,000	315	10.95	2.70	0.18	0.12	0.26	0.41	0.75	1.63	3.41	6.06	8.47	15.30	23.20
Suburban	3,589,000	226	4.15	1.77	0.10	0.03	0.29	0.37	0.68	1.33	2.49	3.66	4.71	7.20	10.10
Race															
Black	128,000	6	0.59	*		*	*	*	*	*	*	*	*	*	*
White	8,995,000	556	5.71	2.26	0.11	0.09	0.26	0.39	0.68	1.41	2.91	5.00	7.01	14.00	23.20
Response to Questionnaire															
Households who raise animals	5,256,000	343	52.06	2.80	0.15	0.21	0.39	0.62	1.03	1.94	3.49	5.90	7.84	14.00	23.20

* Intake data not provided for subpopulations for which there were less than 20 observations.
SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Moya and Phillips (2001). (Based on EPA's analyses of the 1987–1988 NFCS.)

Table 13-16. Consumer-Only Intake of Home-Produced Meats (g/kg-day)—Northeast

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,113,000	52	2.70	1.46	0.21	0.29	0.34	0.35	0.64	0.89	1.87	2.68	2.89	10.90	10.90
Season															
Fall	569,000	18	6.06	*	*	*	*	*	*	*	*	*	*	*	*
Spring	66,000	8	0.63	*	*	*	*	*	*	*	*	*	*	*	*
Summer	176,000	6	1.86	*	*	*	*	*	*	*	*	*	*	*	*
Winter	302,000	20	2.56	2.02	0.56	0.29	0.31	0.43	0.62	1.11	2.38	2.93	7.46	10.90	10.90
Urbanization															
Central City	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Non-metropolitan	391,000	17	7.08	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	722,000	35	2.78	1.49	0.15	0.29	0.35	0.43	0.68	1.39	2.34	2.68	2.89	3.61	3.61
Response to Questionnaire															
Households who raise animals	509,000	25	43.21	2.03	0.39	0.62	0.65	0.65	0.88	1.62	2.38	2.93	7.46	10.90	10.90
Households who farm	373,000	15	44.94	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.
SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-17. Consumer-Only Intake of Home-Produced Meats (g/kg-day)—Midwest

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	3,974,000	266	8.57	2.55	0.18	0.13	0.26	0.39	0.66	1.40	3.39	5.75	7.20	15.30	22.30
Season															
Fall	1,261,000	49	8.76	1.76	0.23	0.21	0.26	0.37	0.50	1.19	2.66	3.49	6.06	6.78	6.78
Spring	940,000	116	8.82	2.58	0.22	0.24	0.31	0.41	0.73	1.98	3.67	5.14	7.79	11.50	13.00
Summer	930,000	38	9.09	4.10	0.75	0.09	0.13	0.58	0.89	2.87	5.42	8.93	15.30	22.30	22.30
Winter	843,000	63	7.59	2.00	0.24	0.12	0.24	0.33	0.65	1.36	2.69	4.11	5.30	8.10	12.20
Urbanization															
Central City	460,000	18	2.64	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	2,477,000	175	17.33	3.15	0.26	0.09	0.30	0.43	0.82	2.38	4.34	6.15	9.17	15.30	22.30
Suburban	1,037,000	73	7.05	1.75	0.20	0.29	0.37	0.41	0.66	1.11	2.03	4.16	5.39	7.20	10.10
Response to Questionnaire															
Households who raise animals	2,165,000	165	57.86	3.20	0.22	0.26	0.39	0.58	1.07	2.56	4.42	6.06	9.13	15.30	15.30
Households who farm	1,483,000	108	55.32	3.32	0.29	0.37	0.54	0.59	1.07	2.75	4.71	6.78	9.17	15.30	15.30

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-18. Consumer-Only Intake of Home-Produced Meats (g/kg-day)—South

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,355,000	146	3.66	2.24	0.19	0.02	0.16	0.30	0.72	1.53	3.07	5.07	6.71	14.00	14.00
Season															
Fall	758,000	28	5.75	1.81	0.29	0.12	0.16	0.19	0.82	1.53	2.38	3.19	4.41	7.84	7.84
Spring	511,000	53	3.04	2.33	0.27	0.19	0.30	0.50	0.75	1.80	2.82	5.16	6.71	7.51	7.51
Summer	522,000	18	2.94	*	*	*	*	*	*	*	*	*	*	*	*
Winter	564,000	47	3.40	1.80	0.25	0.04	0.20	0.25	0.72	1.40	2.17	3.55	4.58	8.47	8.47
Urbanization															
Central City	40,000	1	0.23	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,687,000	97	8.83	2.45	0.26	0.12	0.19	0.40	0.78	1.61	3.19	6.09	7.84	14.00	14.00
Suburban	628,000	48	2.24	1.79	0.23	0.02	0.03	0.04	0.63	1.40	2.31	4.56	4.61	6.40	6.40
Response to Questionnaire															
Households who raise animals	1,222,000	74	46.95	3.16	0.32	0.26	0.67	0.84	1.34	2.11	3.79	6.67	8.47	14.00	14.00
Households who farm	1,228,000	72	55.02	2.85	0.32	0.20	0.50	0.60	1.01	1.93	3.48	6.23	8.47	14.00	14.00

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-19. Consumer-Only Intake of Home-Produced Meats (g/kg-day)—West

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,815,000	105	5.03	1.89	0.21	0.15	0.23	0.39	0.66	1.42	2.49	3.66	4.71	8.00	23.20
Season															
Fall	264,000	12	2.47	*	*	*	*	*	*	*	*	*	*	*	*
Spring	209,000	20	2.56	1.86	0.23	0.30	0.43	0.87	1.22	1.56	2.43	3.48	4.20	4.20	4.20
Summer	740,000	27	9.27	2.20	0.32	0.19	0.41	0.54	1.07	1.69	3.27	4.44	4.71	8.00	8.00
Winter	602,000	46	6.53	2.11	0.46	0.14	0.36	0.43	0.67	1.19	2.35	3.64	7.02	23.20	23.20
Urbanization															
Central City	236,000	9	1.96	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	377,000	26	6.17	2.10	0.70	0.33	0.33	0.41	0.67	1.19	1.77	3.72	4.97	23.20	23.20
Suburban	1,202,000	70	6.71	1.95	0.20	0.15	0.23	0.37	0.78	1.52	2.71	4.20	4.71	8.00	8.00
Response to Questionnaire															
Households who raise animals	1,360,000	79	52.84	2.12	0.27	0.15	0.23	0.39	0.82	1.56	2.71	4.20	4.97	8.00	23.20
Households who farm	758,000	48	47.79	2.41	0.43	0.14	0.33	0.47	0.79	1.55	2.91	4.71	7.02	23.20	23.20

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-20. Consumer-Only Intake of Home-Caught Fish (g/kg-day)—All Regions Combined

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	3,914,000	239	2.08	2.07	0.24	0.08	0.09	0.20	0.23	0.43	1.00	2.17	4.68	7.83	15.50
Age															
1 to 2	82,000	6	1.44	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	142,000	11	1.75	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	382,000	29	2.29	2.78	0.84	0.16	0.16	0.18	0.23	0.55	1.03	3.67	7.05	7.85	25.30
12 to 19	346,000	21	1.69	1.52	0.41	0.20	0.20	0.20	0.20	0.31	0.98	1.79	4.68	6.67	8.44
20 to 39	962,000	59	1.56	1.91	0.33	0.08	0.08	0.09	0.12	0.44	1.06	2.18	4.46	9.57	13.00
40 to 69	1,524,000	86	2.69	1.79	0.26	0.09	0.09	0.21	0.28	0.35	0.99	1.99	4.43	6.56	10.80
≥ 70	450,000	24	2.83	1.22	0.23	0.10	0.10	0.23	0.23	0.57	0.76	1.56	3.73	3.73	5.12
Season															
Fall	1,220,000	45	2.56	1.31	0.22	0.18	0.18	0.20	0.21	0.32	0.92	1.79	2.64	3.73	6.56
Spring	1,112,000	114	2.41	3.08	0.56	0.10	0.12	0.31	0.34	0.56	1.27	2.64	6.68	10.80	37.30
Summer	911,000	29	2.00	1.88	0.42	0.08	0.08	0.09	0.20	0.30	0.76	3.19	4.43	5.65	9.57
Winter	671,000	51	1.38	2.05	0.37	0.09	0.09	0.11	0.16	0.51	1.06	2.09	5.89	7.85	13.10
Urbanization															
Central City	999,000	46	1.77	1.79	0.34	0.09	0.09	0.16	0.28	0.61	1.07	1.85	3.73	9.57	9.57
Non-metropolitan	1,174,000	94	2.61	3.15	0.57	0.10	0.12	0.31	0.36	0.57	1.88	3.86	6.52	7.83	37.30
Suburban	1,741,000	99	2.01	1.50	0.23	0.08	0.08	0.18	0.20	0.29	0.59	1.38	4.37	7.05	10.80
Race															
Black	593,000	41	2.73	1.81	0.37	0.18	0.18	0.20	0.29	0.32	0.98	2.17	4.68	9.57	9.57
White	3,228,000	188	2.05	2.07	0.28	0.08	0.08	0.16	0.23	0.39	1.00	2.16	4.99	6.68	16.10
Response to Questionnaire															
Households who fish	3,553,000	220	8.94	2.22	0.26	0.08	0.08	0.18	0.23	0.47	1.09	2.23	5.61	7.85	16.10

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Moya and Phillips (2001). (Based on EPA's analyses of the 1987–1988 NFCS.)

Table 13-21. Consumer-Only Intake of Home-Caught Fish (g/kg-day)—Northeast

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	334,000	12	0.81	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	135,000	4	1.44	*	*	*	*	*	*	*	*	*	*	*	*
Spring	14,000	2	0.13	*	*	*	*	*	*	*	*	*	*	*	*
Summer	132,000	3	1.40	*	*	*	*	*	*	*	*	*	*	*	*
Winter	53,000	3	0.45	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City		0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Non-metropolitan	42,000	4	0.76	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	292,000	8	1.12	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who fish	334,000	12	5.61	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-22. Consumer-Only Intake of Home-Caught Fish (g/kg-day)—Midwest

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,113,000	71	2.40	2.13	0.42	0.08	0.08	0.20	0.23	0.47	1.03	1.95	6.10	6.56	16.10
Season															
Fall	362,000	13	2.51	*	*	*	*	*	*	*	*	*	*	*	*
Spring	224,000	27	2.10	3.45	1.22	0.12	0.12	0.12	0.31	0.49	0.82	1.67	15.50	16.10	25.30
Summer	264,000	8	2.58	*	*	*	*	*	*	*	*	*	*	*	*
Winter	263,000	23	2.37	2.38	0.53	0.51	0.51	0.51	0.55	1.03	1.56	2.13	5.89	6.10	13.10
Urbanization															
Central City	190,000	9	1.09	*		*	*	*	*	*	*	*	*	*	*
Non-metropolitan	501,000	40	3.50	3.42	0.72	0.12	0.12	0.33	0.47	0.53	1.88	5.65	6.56	13.10	25.30
Suburban	422,000	22	2.87	0.91	0.18	0.08	0.08	0.08	0.20	0.30	0.55	1.28	2.09	2.78	3.73
Response to Questionnaire															
Households who fish	956,000	60	7.57	2.35	0.49	0.08	0.08	0.12	0.23	0.47	1.12	2.16	6.52	6.56	25.30

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-23. Consumer-Only Intake of Home-Caught Fish (g/kg-day)—South

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,440,000	101	2.24	2.74	0.48	0.09	0.09	0.20	0.29	0.51	1.48	3.37	5.61	8.44	37.30
Season															
Fall	274,000	11	2.08	*	*	*	*	*	*	*	*	*	*	*	*
Spring	538,000	58	3.20	4.00	0.94	0.31	0.31	0.39	0.45	0.87	1.94	3.71	8.33	13.00	45.20
Summer	376,000	14	2.12	*	*	*	*	*	*	*	*	*	*	*	*
Winter	252,000	18	1.52	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	281,000	16	1.63	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	550,000	41	2.88	3.33	1.06	0.29	0.29	0.34	0.51	1.12	1.94	3.19	4.43	6.67	45.20
Suburban	609,000	44	2.18	2.73	0.50	0.20	0.20	0.28	0.29	0.43	1.08	4.37	8.33	10.40	13.00
Response to Questionnaire															
Households who fish	1,280,000	95	9.42	3.00	0.51	0.09	0.09	0.20	0.28	0.71	1.93	3.67	6.68	8.44	37.30

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-24. Consumer-Only Intake of Home-Caught Fish (g/kg-day)—West

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,027,000	55	2.85	1.57	0.27	0.10	0.16	0.20	0.24	0.44	0.84	1.79	3.73	5.67	9.57
Season															
Fall	449,000	17	4.20	*	*	*	*	*	*	*	*	*	*	*	*
Spring	336,000	27	4.12	1.35	0.29	0.10	0.10	0.24	0.33	0.44	0.61	1.68	4.68	5.61	5.67
Summer	139,000	4	1.74	*	*	*	*	*	*	*	*	*	*	*	*
Winter	103,000	7	1.12	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	528,000	21	4.38	2.03	0.53	0.33	0.33	0.43	0.53	0.71	1.45	1.85	3.73	9.57	9.57
Non-metropolitan	81,000	9	1.33	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	418,000	25	2.33	1.09	0.25	0.18	0.18	0.20	0.21	0.31	0.59	1.21	2.90	4.68	5.61
Response to Questionnaire														*	
Households who fish	983,000	53	12.99	1.63	0.28	0.10	0.16	0.20	0.22	0.55	0.96	1.79	3.73	5.67	9.57

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-25. Consumer-Only Intake of Home-Produced Dairy (g/kg-day)—All Regions

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,409,000	89	0.75	14.00	1.62	0.18	0.45	0.51	3.18	10.20	19.50	34.20	44.00	72.60	111.00
Age															
1 to 2	79,000	6	1.39	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	57,000	5	0.70	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	264,000	16	1.58	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	84,000	5	0.41	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	612,000	36	0.99	7.41	1.02	0.21	0.40	0.45	1.89	6.46	12.10	15.40	19.50	23.00	23.00
40 to 69	216,000	16	0.38	*	*	*	*	*	*	*	*	*	*	*	*
≥ 70	77,000	3	0.48	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	211,000	7	0.44	*	*	*	*	*	*	*	*	*	*	*	*
Spring	253,000	27	0.55	17.80	4.27	0.63	0.65	0.67	5.06	12.20	19.50	50.90	80.10	111.00	111.00
Summer	549,000	22	1.21	15.30	2.73	0.45	0.45	0.51	5.36	10.60	25.10	34.90	36.70	46.80	46.80
Winter	396,000	33	0.81	8.08	1.99	0.18	0.21	0.28	0.74	5.47	11.50	19.80	20.40	72.60	72.60
Urbanization															
Central City	115,000	7	0.20	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	988,000	59	2.19	16.80	2.10	0.48	0.96	1.89	6.74	10.80	20.40	34.90	44.00	80.10	111.00
Suburban	306,000	23	0.35	9.86	2.38	0.40	0.40	0.45	0.57	5.36	13.10	28.10	28.90	50.90	50.90
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	1,382,000	86	0.88	14.30	1.65	0.18	0.45	0.51	3.82	10.30	19.50	34.20	44.00	80.10	111.00
Response to Questionnaire															
Households who raise animals	1,228,000	80	12.16	15.90	1.73	0.18	0.40	1.89	6.13	10.80	19.60	34.90	44.00	80.10	111.00
Households who farm	1,020,000	63	13.92	17.10	1.99	0.40	0.74	3.18	9.06	12.10	20.40	34.90	44.00	80.10	111.00

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Moya and Phillips (2001). (Based on EPA's analyses of the 1987–1988 NFCS.)

Table 13-26. Consumer-Only Intake of Home-Produced Dairy (g/kg-day)—Northeast

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	312,000	16	0.76	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	48,000	2	0.51	*	*	*	*	*	*	*	*	*	*	*	*
Spring	36,000	4	0.34	*	*	*	*	*	*	*	*	*	*	*	*
Summer	116,000	4	1.23	*	*	*	*	*	*	*	*	*	*	*	*
Winter	112,000	6	0.95	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Non-metropolitan	240,000	10	4.35	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	72,000	6	0.28	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who raise animals	312,000	16	26.49	*	*	*	*	*	*	*	*	*	*	*	*
Households who farm	312,000	16	37.59	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-27. Consumer-Only Intake of Home-Produced Dairy (g/kg-day)—Midwest

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	594,000	36	1.28	18.60	3.15	0.45	0.45	1.97	8.27	12.40	23.00	44.00	46.80	111.00	111.00
Season															
Fall	163,000	5	1.13	*	*	*	*	*	*	*	*	*	*	*	*
Spring	94,000	12	0.88	*	*	*	*	*	*	*	*	*	*	*	*
Summer	252,000	11	2.46	*	*	*	*	*	*	*	*	*	*	*	*
Winter	85,000	8	0.76	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	43,000	1	0.25	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	463,000	31	3.24	23.30	3.40	4.25	8.27	9.06	12.10	16.00	31.40	44.00	46.80	111.00	111.00
Suburban	88,000	4	0.60	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who raise animals	490,000	32	13.09	22.30	3.33	4.25	5.36	8.27	10.80	15.40	31.40	44.00	46.80	111.00	111.00
Households who farm	490,000	32	18.28	22.30	3.33	4.25	5.36	8.27	10.80	15.40	31.40	44.00	46.80	111.00	111.00

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-28. Consumer-Only Intake of Home-Produced Dairy (g/kg-day)—South

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	242,000	17	0.38	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Spring	27,000	3	0.16	*	*	*	*	*	*	*	*	*	*	*	*
Summer	131,000	5	0.74	*	*	*	*	*	*	*	*	*	*	*	*
Winter	84,000	9	0.51	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	27,000	3	0.16	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	215,000	14	1.13	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Response to Questionnaire															
Households who raise animals	215,000	14	8.26	*	*	*	*	*	*	*	*	*	*	*	*
Households who farm	148,000	8	6.63	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-29. Consumer-Only Intake of Home-Produced Dairy (g/kg-day)—West

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	261,000	20	0.72	10.00	2.75	0.18	0.18	0.21	0.51	6.10	13.30	28.10	28.90	50.90	50.90
Season															
Fall	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Spring	96,000	8	1.18	*	*	*	*	*	*	*	*	*	*	*	*
Summer	50,000	2	0.63	*	*	*	*	*	*	*	*	*	*	*	*
Winter	115,000	10	1.25	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	45,000	3	0.37	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	70,000	4	1.15	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	146,000	13	0.81	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who raise animals	211,000	18	8.20	*	*	*	*	*	*	*	*	*	*	*	*
Households who farm	70,000	7	4.41	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-30. Seasonally Adjusted Consumer-Only Home-Produced Intake (g/kg-day)

Population Group	Percent Consuming	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total Vegetable											
Northeast	16.50	0.00	0.02	0.04	0.20	0.46	1.37	3.32	5.70	8.78	10.10
Midwest	33.25	0.00	0.04	0.08	0.29	0.81	1.96	4.40	7.41	1.31	20.10
South	24.00	0.00	0.03	0.06	0.21	0.61	1.86	3.95	5.63	12.00	16.20
West	23.75	0.00	0.02	0.04	0.11	0.49	1.46	2.99	5.04	8.91	11.20
All Regions	24.60	0.01	0.03	0.06	0.22	0.64	1.80	4.00	6.08	11.70	20.10
Total Fruit											
Northeast	3.50	0.00	0.02	0.05	0.17	0.36	0.66	1.48	3.00	5.10	5.63
Midwest	12.75	0.00	0.01	0.01	0.14	0.79	2.98	5.79	9.52	22.20	27.10
South	8.00	0.01	0.03	0.11	0.38	0.95	2.10	6.70	10.20	14.90	16.40
West	17.75	0.00	0.06	0.09	0.29	0.69	1.81	4.75	8.54	14.50	18.40
All Regions	10.10	0.00	0.02	0.06	0.25	0.75	2.35	5.61	9.12	17.60	27.10
Total Meat											
Northeast	6.25	0.00	0.03	0.08	0.13	0.21	0.70	1.56	1.91	4.09	4.80
Midwest	9.25	0.00	0.04	0.22	0.05	1.61	3.41	5.25	7.45	11.90	13.60
South	5.75	0.01	0.03	0.05	0.19	0.53	1.84	3.78	4.95	8.45	9.45
West	9.50	0.00	0.03	0.10	0.24	0.56	1.30	2.29	3.38	7.20	9.10
All Regions	7.40	0.00	0.04	0.09	0.22	0.66	1.96	4.05	5.17	9.40	13.60

Source: Moya and Phillips (2001). (Based on U.S. EPA's analyses of the 1987–1988 NFCS.)

Table 13-31. Consumer-Only Intake of Home-Produced Apples (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	5,306,000	272	2.82	1.19	0.08	0.08	0.23	0.28	0.45	0.82	1.47	2.38	3.40	5.42	10.10
Age															
1 to 2	199,000	12	3.49	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	291,000	16	3.59	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	402,000	25	2.41	1.28	0.19	0.47	0.47	0.56	0.74	0.96	1.29	2.98	4.00	4.00	4.00
12 to 19	296,000	12	1.44	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	1,268,000	61	2.06	0.80	0.11	0.19	0.23	0.26	0.30	0.60	0.92	1.55	1.97	5.42	5.42
40 to 69	1,719,000	90	3.03	0.96	0.14	0.06	0.09	0.26	0.40	0.65	1.08	1.59	2.38	9.83	9.83
≥ 70	1,061,000	52	6.68	1.45	0.14	0.20	0.26	0.45	0.63	1.18	1.82	3.40	3.62	4.20	4.20
Season															
Fall	1,707,000	60	3.58	1.28	0.12	0.26	0.30	0.32	0.58	1.03	1.66	2.69	3.40	4.25	4.25
Spring	639,000	74	1.38	0.95	0.11	0.19	0.24	0.28	0.38	0.57	1.10	2.00	2.78	5.87	5.87
Summer	1,935,000	68	4.25	1.12	0.17	0.06	0.09	0.19	0.40	0.69	1.41	2.29	2.98	9.83	9.83
Winter	1,025,000	70	2.10	1.30	0.18	0.19	0.23	0.32	0.57	0.88	1.59	2.75	3.40	10.10	10.10
Urbanization															
Central City	912,000	30	1.62	1.24	0.26	0.23	0.26	0.39	0.51	0.92	1.59	2.19	2.26	10.10	10.10
Non-metropolitan	2,118,000	122	4.70	1.27	0.13	0.06	0.12	0.25	0.41	0.90	1.55	2.92	3.48	9.83	9.83
Suburban	2,276,000	120	2.63	1.09	0.09	0.19	0.24	0.29	0.44	0.77	1.29	2.29	3.40	5.42	5.42
Race															
Black	84,000	4	0.39	*	*	*	*	*	*	*	*	*	*	*	*
White	5,222,000	268	3.31	1.18	0.08	0.08	0.23	0.28	0.45	0.80	1.41	2.38	3.40	5.42	10.10
Region															
Midwest	2,044,000	123	4.41	1.38	0.15	0.22	0.29	0.30	0.52	0.92	1.61	2.69	3.40	9.83	10.10
Northeast	442,000	18	1.07	*	*	*	*	*	*	*	*	*	*	*	*
South	1,310,000	65	2.04	1.10	0.11	0.20	0.24	0.30	0.44	0.92	1.38	1.90	2.98	4.00	4.91
West	1,510,000	66	4.19	1.20	0.13	0.06	0.19	0.26	0.47	0.79	1.82	2.75	3.62	4.25	4.25
Response to Questionnaire															
Households who garden	4,707,000	246	6.91	1.21	0.08	0.13	0.25	0.30	0.47	0.82	1.47	2.38	3.40	5.87	10.10
Households who farm	1,299,000	68	17.72	1.39	0.13	0.06	0.36	0.54	0.70	0.96	1.58	2.99	4.00	4.91	5.87

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-32. Consumer-Only Intake of Home-Produced Asparagus (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	763,000	66	0.41	0.56	0.05	0.10	0.14	0.19	0.28	0.40	0.71	1.12	1.63	1.97	1.97
Age															
1 to 2	8,000	1	0.14	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	25,000	3	0.31	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	31,000	3	0.19	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	70,000	5	0.34	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	144,000	11	0.23	*	*	*	*	*	*	*	*	*	*	*	*
40 to 69	430,000	38	0.76	0.47	0.05	0.11	0.11	0.18	0.23	0.40	0.60	0.88	1.24	1.75	1.75
≥ 70	55,000	5	0.35	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	62,000	2	0.13	*	*	*	*	*	*	*	*	*	*	*	*
Spring	608,000	59	1.32	0.61	0.06	0.10	0.16	0.19	0.30	0.45	0.88	1.18	1.63	1.97	1.97
Summer	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Winter	93,000	5	0.19	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	190,000	9	0.34	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	215,000	27	0.48	0.76	0.12	0.10	0.11	0.14	0.23	0.54	1.24	1.75	1.92	1.97	1.97
Suburban	358,000	30	0.41	0.43	0.04	0.11	0.17	0.18	0.28	0.37	0.58	0.70	0.93	1.12	1.12
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	763,000	66	0.48	0.56	0.05	0.10	0.14	0.19	0.28	0.40	0.71	1.12	1.63	1.97	1.97
Region															
Midwest	368,000	33	0.79	0.48	0.06	0.10	0.11	0.14	0.23	0.40	0.61	0.93	1.12	1.97	1.97
Northeast	270,000	20	0.66	0.72	0.10	0.18	0.23	0.23	0.37	0.60	0.93	1.24	1.63	1.92	1.92
South	95,000	9	0.15	*	*	*	*	*	*	*	*	*	*	*	*
West	30,000	4	0.08	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	669,000	59	0.98	0.53	0.06	0.10	0.14	0.18	0.28	0.40	0.70	1.12	1.63	1.97	1.97
Households who farm	157,000	16	2.14	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-33. Consumer-Only Intake of Home-Produced Beef (g/kg-day)

Population Group	Nc wgtd	Nc Unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,958,000	304	2.64	2.45	0.15	0.18	0.37	0.47	0.88	1.61	3.07	5.29	7.24	13.30	19.40
Age															
1 to 2	110,000	8	1.93	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	234,000	13	2.89	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	695,000	38	4.16	3.77	0.59	0.35	0.66	0.75	1.32	2.11	4.43	11.40	12.50	13.30	13.30
12 to 19	656,000	41	3.20	1.72	0.16	0.38	0.48	0.51	0.90	1.51	2.44	3.53	3.57	4.28	4.28
20 to 39	1,495,000	83	2.43	2.06	0.20	0.27	0.35	0.39	0.68	1.59	2.73	4.88	6.50	8.26	8.26
40 to 69	1,490,000	105	2.63	1.84	0.14	0.18	0.36	0.46	0.83	1.52	2.38	4.10	5.39	5.90	5.90
≥ 70	188,000	11	1.18	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	1,404,000	55	2.95	1.55	0.17	0.18	0.35	0.36	0.52	1.33	2.01	2.86	3.90	7.24	7.24
Spring	911,000	108	1.97	2.32	0.16	0.27	0.39	0.51	1.04	1.96	3.29	4.22	5.23	8.62	9.28
Summer	1,755,000	69	3.86	3.48	0.41	0.10	0.61	0.75	1.02	2.44	4.43	7.51	11.40	18.70	18.70
Winter	888,000	72	1.82	1.95	0.28	0.04	0.38	0.39	0.67	1.33	2.14	4.23	5.39	19.40	19.40
Urbanization															
Central City	100,000	5	0.18	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	3,070,000	194	6.82	2.80	0.22	0.18	0.38	0.50	0.86	1.81	3.57	6.03	8.44	18.70	19.40
Suburban	1,788,000	105	2.07	1.93	0.15	0.27	0.38	0.42	0.91	1.52	2.44	4.06	5.10	7.51	9.28
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	4,950,000	303	3.14	2.45	0.15	0.18	0.37	0.47	0.88	1.61	3.07	5.29	7.24	13.30	19.40
Region															
Midwest	2,261,000	161	4.87	2.83	0.23	0.18	0.35	0.42	0.85	2.01	3.66	5.90	8.39	18.70	18.70
Northeast	586,000	25	1.42	1.44	0.21	0.35	0.35	0.47	0.74	1.06	1.68	2.62	2.62	6.03	6.03
South	1,042,000	61	1.62	2.45	0.35	0.10	0.39	0.58	0.82	1.59	2.41	6.36	7.24	13.30	13.30
West	1,069,000	57	2.96	2.20	0.28	0.31	0.38	0.56	1.04	1.60	2.86	4.06	4.42	7.51	19.40
Response to Questionnaire															
Households who raise animals	3,699,000	239	36.63	2.66	0.16	0.18	0.39	0.66	1.04	1.83	3.48	5.39	7.51	12.50	19.40
Households who farm	2,850,000	182	38.89	2.63	0.20	0.27	0.39	0.59	0.90	1.64	3.25	5.39	7.51	11.30	19.40

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-34. Consumer-Only Intake of Home-Produced Beets (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,214,000	125	1.18	0.51	0.05	0.03	0.07	0.11	0.19	0.40	0.59	1.03	1.36	3.69	4.08
Age															
1 to 2	27,000	2	0.47	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	51,000	4	0.63	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	167,000	10	1.00	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	227,000	13	1.11	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	383,000	22	0.62	0.38	0.06	0.08	0.08	0.12	0.14	0.29	0.56	1.00	1.00	1.12	1.12
40 to 69	951,000	51	1.68	0.43	0.04	0.05	0.07	0.07	0.21	0.40	0.55	0.93	1.15	1.40	1.40
≥ 70	408,000	23	2.57	0.58	0.09	0.03	0.03	0.05	0.27	0.45	0.91	1.36	1.36	1.59	1.59
Season															
Fall	562,000	21	1.18	0.55	0.09	0.03	0.05	0.05	0.26	0.36	0.95	1.36	1.36	1.40	1.40
Spring	558,000	55	1.21	0.47	0.09	0.07	0.08	0.11	0.14	0.27	0.45	0.87	1.59	4.08	4.08
Summer	676,000	22	1.49	0.39	0.05	0.08	0.12	0.12	0.18	0.40	0.55	0.62	0.91	0.91	0.91
Winter	418,000	27	0.86	0.73	0.15	0.07	0.07	0.07	0.28	0.52	0.83	1.13	2.32	3.69	3.69
Urbanization															
Central City	651,000	27	1.16	0.52	0.12	0.11	0.14	0.18	0.26	0.40	0.55	0.91	1.12	3.69	3.69
Non-metropolitan	758,000	51	1.68	0.58	0.09	0.05	0.07	0.07	0.18	0.39	0.66	1.36	1.40	4.08	4.08
Suburban	805,000	47	0.93	0.45	0.06	0.03	0.05	0.08	0.14	0.40	0.56	0.93	1.00	2.32	2.32
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	2,186,000	124	1.39	0.52	0.05	0.03	0.07	0.11	0.21	0.40	0.59	1.03	1.36	3.69	4.08
Region															
Midwest	885,000	53	1.91	0.63	0.08	0.05	0.11	0.18	0.32	0.45	0.91	1.15	1.36	3.69	3.69
Northeast	230,000	13	0.56	*	*	*	*	*	*	*	*	*	*	*	*
South	545,000	31	0.85	0.45	0.12	0.07	0.08	0.08	0.18	0.26	0.48	0.66	0.94	4.08	4.08
West	554,000	28	1.54	0.40	0.08	0.03	0.05	0.07	0.12	0.29	0.55	0.62	0.70	2.32	2.32
Response to Questionnaire															
Households who garden	2,107,000	120	3.09	0.53	0.05	0.03	0.07	0.10	0.21	0.40	0.61	1.03	1.36	3.69	4.08
Households who farm	229,000	11	3.12	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-35. Consumer-Only Intake of Home-Produced Broccoli (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,745,000	80	0.93	0.42	0.05	0.08	0.08	0.16	0.20	0.29	0.46	0.82	0.97	2.48	3.02
Age															
1 to 2	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
3 to 5	13,000	1	0.16	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	187,000	9	1.12	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	102,000	4	0.50	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	486,000	19	0.79	*	*	*	*	*	*	*	*	*	*	*	*
40 to 69	761,000	37	1.34	0.41	0.07	0.08	0.11	0.16	0.22	0.35	0.46	0.61	0.82	3.02	3.02
≥ 70	196,000	10	1.23	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	624,000	20	1.31	0.29	0.04	0.08	0.08	0.08	0.18	0.23	0.38	0.45	0.53	0.82	0.82
Spring	258,000	27	0.56	0.54	0.12	0.05	0.15	0.17	0.27	0.33	0.59	1.25	2.37	3.02	3.02
Summer	682,000	22	1.50	0.51	0.11	0.08	0.13	0.18	0.22	0.40	0.66	0.89	0.97	2.48	2.48
Winter	181,000	11	0.37	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	165,000	5	0.29	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	647,000	34	1.44	0.42	0.04	0.05	0.13	0.17	0.22	0.37	0.59	0.75	0.89	0.97	0.97
Suburban	933,000	41	1.08	0.43	0.08	0.08	0.08	0.14	0.21	0.24	0.44	0.68	2.37	2.48	3.02
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	1,719,000	79	1.09	0.42	0.05	0.08	0.08	0.16	0.20	0.29	0.46	0.82	0.97	2.48	3.02
Region															
Midwest	792,000	38	1.71	0.26	0.06	0.08	0.08	0.08	0.18	0.21	0.28	0.34	0.40	3.02	3.02
Northeast	427,000	19	1.04	*	*	*	*	*	*	*	*	*	*	*	*
South	373,000	16	0.58	*	*	*	*	*	*	*	*	*	*	*	*
West	153,000	7	0.42	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	1,729,000	78	2.54	0.42	0.05	0.08	0.08	0.16	0.20	0.29	0.46	0.82	0.97	2.48	3.02
Households who farm	599,000	29	8.17	0.47	0.08	0.05	0.08	0.15	0.20	0.31	0.66	0.89	0.97	3.02	3.02

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-36. Consumer-Only Intake of Home-Produced Cabbage (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,019,000	89	1.07	1.03	0.10	0.11	0.20	0.32	0.42	0.78	1.33	1.97	2.35	5.43	5.43
Age															
1 to 2	14,000	2	0.25	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	29,000	1	0.36	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	61,000	3	0.37	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	203,000	9	0.99	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	391,000	16	0.63	*	*	*	*	*	*	*	*	*	*	*	*
40 to 69	966,000	44	1.70	1.14	0.18	0.22	0.22	0.33	0.41	0.71	1.41	1.82	5.29	5.43	5.43
≥ 70	326,000	13	2.05	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	570,000	21	1.20	1.28	0.32	0.19	0.19	0.20	0.39	0.54	1.49	5.29	5.43	5.43	5.43
Spring	126,000	15	0.27	*	*	*	*	*	*	*	*	*	*	*	*
Summer	1,142,000	39	2.51	0.97	0.09	0.20	0.22	0.33	0.56	0.83	1.24	1.79	2.35	2.77	2.77
Winter	181,000	14	0.37	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	157,000	5	0.28	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,079,000	48	2.40	0.94	0.09	0.20	0.32	0.34	0.45	0.71	1.33	1.79	2.35	2.77	2.77
Suburban	783,000	36	0.90	1.26	0.21	0.03	0.22	0.33	0.45	1.05	1.37	2.17	5.29	5.43	5.43
Race															
Black	7,000	1	0.03	*	*	*	*	*	*	*	*	*	*	*	*
White	1,867,000	83	1.19	1.05	0.11	0.11	0.20	0.25	0.41	0.79	1.37	1.97	2.35	5.43	5.43
Region															
Midwest	884,000	37	1.91	0.74	0.07	0.11	0.19	0.22	0.36	0.60	1.10	1.29	1.49	1.82	1.98
Northeast	277,000	11	0.67	*	*	*	*	*	*	*	*	*	*	*	*
South	616,000	32	0.96	1.11	0.13	0.03	0.20	0.22	0.45	0.85	1.79	2.17	2.35	2.77	2.77
West	242,000	9	0.67	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	1,921,000	86	2.82	1.07	0.10	0.11	0.20	0.32	0.45	0.79	1.37	1.97	2.35	5.43	5.43
Households who farm	546,000	26	7.45	1.00	0.12	0.20	0.21	0.35	0.59	0.83	1.37	1.79	2.35	2.35	2.35

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-37. Consumer-Only Intake of Home-Produced Carrots (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,322,000	193	2.30	0.44	0.04	0.04	0.06	0.09	0.18	0.33	0.53	0.80	1.08	2.21	7.79
Age															
1 to 2	51,000	4	0.89	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	53,000	3	0.65	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	299,000	14	1.79	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	389,000	17	1.90	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	1,043,000	46	1.69	0.28	0.03	0.04	0.05	0.08	0.12	0.20	0.41	0.56	0.76	1.19	1.19
40 to 69	1,848,000	82	3.26	0.43	0.03	0.04	0.07	0.12	0.22	0.37	0.55	0.78	1.01	1.53	2.21
≥ 70	574,000	24	3.61	0.44	0.06	0.07	0.18	0.20	0.26	0.37	0.54	0.96	1.08	1.08	1.08
Season															
Fall	1,810,000	66	3.80	0.46	0.10	0.09	0.11	0.12	0.20	0.31	0.51	0.78	1.08	1.71	7.79
Spring	267,000	28	0.58	0.56	0.10	0.14	0.15	0.20	0.22	0.39	0.61	0.99	2.11	2.94	2.94
Summer	1,544,000	49	3.39	0.39	0.04	0.04	0.05	0.07	0.16	0.38	0.51	0.84	0.96	1.19	1.19
Winter	701,000	50	1.44	0.44	0.07	0.04	0.04	0.06	0.16	0.23	0.64	1.05	1.53	3.06	3.06
Urbanization															
Central City	963,000	29	1.71	0.28	0.04	0.04	0.06	0.08	0.16	0.21	0.39	0.53	0.59	0.96	0.96
Non-metropolitan	1,675,000	94	3.72	0.52	0.09	0.04	0.05	0.07	0.20	0.33	0.51	0.96	1.19	7.79	7.79
Suburban	1,684,000	70	1.94	0.45	0.04	0.07	0.09	0.12	0.20	0.38	0.64	0.80	1.09	1.71	1.71
Race															
Black	107,000	7	0.49	*	*	*	*	*	*	*	*	*	*	*	*
White	3,970,000	178	2.52	0.41	0.03	0.04	0.08	0.11	0.19	0.33	0.53	0.78	1.01	1.59	3.06
Region															
Midwest	2,001,000	97	4.31	0.46	0.04	0.04	0.08	0.14	0.20	0.37	0.54	0.96	1.10	2.11	3.06
Northeast	735,000	29	1.79	0.41	0.09	0.04	0.05	0.06	0.09	0.15	0.64	1.09	1.71	2.21	2.21
South	378,000	20	0.59	0.63	0.36	0.04	0.04	0.05	0.15	0.27	0.41	0.50	0.99	7.79	7.79
West	1,208,000	47	3.35	0.37	0.03	0.07	0.09	0.14	0.19	0.33	0.46	0.76	0.84	0.96	0.96
Response to Questionnaire															
Households who garden	4,054,000	182	5.95	0.40	0.03	0.04	0.07	0.09	0.18	0.33	0.51	0.76	1.08	1.71	3.06
Households who farm	833,000	40	11.37	0.36	0.06	0.09	0.09	0.11	0.18	0.23	0.46	0.62	1.19	2.11	2.94

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-38. Consumer-Only Intake of Home-Produced Corn (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	6,891,000	421	3.67	0.89	0.06	0.05	0.12	0.17	0.24	0.48	0.91	1.88	3.37	7.44	9.23
Age															
1 to 2	205,000	13	3.60	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	313,000	24	3.86	1.25	0.26	0.33	0.33	0.40	0.60	1.00	1.21	1.67	5.35	5.35	5.35
6 to 11	689,000	43	4.12	0.93	0.17	0.11	0.12	0.19	0.25	0.51	1.08	3.13	3.37	4.52	4.52
12 to 19	530,000	32	2.59	0.59	0.10	0.10	0.11	0.14	0.21	0.34	0.71	1.55	1.88	1.88	1.88
20 to 39	1,913,000	108	3.11	0.60	0.06	0.07	0.14	0.15	0.21	0.37	0.71	1.53	2.04	3.70	3.70
40 to 69	2,265,000	142	3.99	0.86	0.11	0.11	0.15	0.17	0.26	0.52	0.88	1.42	3.22	7.44	7.44
≥ 70	871,000	53	5.48	0.94	0.26	0.04	0.05	0.11	0.19	0.36	0.76	1.34	6.49	9.23	9.23
Season															
Fall	2,458,000	89	5.16	0.54	0.08	0.04	0.11	0.14	0.19	0.32	0.55	1.27	1.42	5.35	5.69
Spring	1,380,000	160	2.99	0.64	0.06	0.14	0.17	0.19	0.26	0.45	0.77	1.21	1.57	5.15	6.68
Summer	1,777,000	62	3.91	1.82	0.26	0.07	0.18	0.34	0.64	0.94	2.13	4.52	6.84	9.23	9.23
Winter	1,276,000	110	2.62	0.55	0.05	0.11	0.12	0.15	0.22	0.41	0.61	1.16	1.47	2.04	3.94
Urbanization															
Central City	748,000	27	1.33	0.74	0.14	0.04	0.04	0.05	0.18	0.55	0.93	2.04	2.23	3.04	3.04
Non-metropolitan	4,122,000	268	9.16	0.96	0.08	0.07	0.12	0.17	0.25	0.53	1.00	2.13	3.38	7.44	8.97
Suburban	2,021,000	126	2.33	0.80	0.13	0.11	0.15	0.17	0.24	0.40	0.65	1.34	1.71	9.23	9.23
Race															
Black	188,000	9	0.86	*	*	*	*	*	*	*	*	*	*	*	*
White	6,703,000	412	4.26	0.89	0.07	0.05	0.12	0.16	0.24	0.48	0.88	1.88	3.22	7.44	9.23
Region															
Midwest	2,557,000	188	5.51	0.93	0.10	0.04	0.12	0.17	0.25	0.46	0.93	2.28	3.22	6.84	7.44
Northeast	586,000	33	1.42	0.61	0.08	0.10	0.17	0.19	0.24	0.38	0.88	1.34	1.71	1.71	1.71
South	2,745,000	153	4.27	0.87	0.10	0.07	0.12	0.17	0.28	0.56	0.94	1.55	3.37	5.69	8.97
West	1,003,000	47	2.78	1.00	0.28	0.11	0.15	0.15	0.18	0.40	0.75	2.23	6.49	9.23	9.23
Response to Questionnaire															
Households who garden	6233000	387	9.15	0.88	0.06	0.05	0.14	0.17	0.24	0.50	0.91	1.82	3.13	6.84	9.23
Households who farm	1739000	114	23.73	1.20	0.18	0.04	0.11	0.17	0.23	0.38	0.97	3.37	6.49	9.23	9.23

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-39. Consumer-Only Intake of Home-Produced Cucumbers (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	3,994,000	141	2.12	1.02	0.16	0.03	0.07	0.11	0.24	0.54	1.13	2.11	2.79	13.40	13.70
Age															
1 to 2	132,000	5	2.32	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	107,000	4	1.32	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	356,000	12	2.13	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	254,000	10	1.24	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	864,000	29	1.40	0.50	0.09	0.03	0.05	0.06	0.18	0.31	0.62	1.35	1.49	2.12	2.12
40 to 69	1,882,000	68	3.32	1.33	0.30	0.04	0.07	0.18	0.39	0.68	1.29	2.11	3.27	13.70	13.70
≥ 70	399,000	13	2.51	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	370,000	12	0.78	*	*	*	*	*	*	*	*	*	*	*	*
Spring	197,000	15	0.43	*	*	*	*	*	*	*	*	*	*	*	*
Summer	3,427,000	114	7.53	1.06	0.18	0.00	0.07	0.11	0.24	0.52	1.13	2.12	2.79	13.40	13.70
Winter	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Urbanization															
Central City	640,000	18	1.14	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,530,000	64	3.40	1.74	0.34	0.10	0.12	0.19	0.39	1.06	1.67	3.09	4.50	13.70	13.70
Suburban	1,824,000	59	2.11	0.67	0.08	0.00	0.07	0.16	0.28	0.50	0.83	1.34	1.73	3.27	3.27
Race															
Black	86,000	2	0.40	*	*	*	*	*	*	*	*	*	*	*	*
White	3,724,000	132	2.36	0.94	0.16	0.03	0.06	0.10	0.22	0.50	1.03	1.49	2.40	13.40	13.70
Region															
Midwest	969,000	31	2.09	1.00	0.39	0.03	0.04	0.05	0.14	0.45	1.03	2.35	2.45	13.40	13.40
Northeast	689,000	22	1.67	1.92	0.68	0.23	0.28	0.28	0.48	0.68	1.53	4.18	11.70	13.70	13.70
South	1,317,000	54	2.05	0.89	0.11	0.00	0.12	0.18	0.29	0.75	1.28	1.73	2.13	4.50	4.50
West	1,019,000	34	2.83	0.60	0.11	0.07	0.07	0.10	0.21	0.43	0.70	1.29	2.11	3.27	3.27
Response to Questionnaire															
Households who garden	3,465,000	123	5.08	1.05	0.18	0.03	0.07	0.10	0.28	0.52	1.13	2.11	2.79	13.40	13.70
Households who farm	710,000	29	9.69	0.70	0.11	0.00	0.00	0.14	0.19	0.39	1.27	1.49	1.71	2.09	2.09

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-40. Consumer-Only Intake of Home-Produced Eggs (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,075,000	124	1.10	0.73	0.10	0.07	0.15	0.18	0.27	0.47	0.90	1.36	1.69	6.58	13.50
Age															
1 to 2	21,000	3	0.37	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	20,000	2	0.25	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	170,000	12	1.02	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	163,000	14	0.80	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	474,000	30	0.77	0.63	0.09	0.07	0.07	0.22	0.30	0.42	0.81	1.32	1.93	2.50	2.50
40 to 69	718,000	43	1.27	0.59	0.06	0.14	0.14	0.15	0.32	0.51	0.84	1.30	1.36	1.38	1.38
≥ 70	489,000	18	3.08	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	542,000	18	1.14	*	*	*	*	*	*	*	*	*	*	*	*
Spring	460,000	54	1.00	1.31	0.29	0.16	0.33	0.39	0.50	0.67	1.31	2.10	3.26	13.50	13.50
Summer	723,000	26	1.59	0.50	0.08	0.07	0.14	0.14	0.26	0.33	0.54	1.36	1.51	1.65	1.65
Winter	350,000	26	0.72	0.86	0.10	0.17	0.18	0.22	0.40	0.75	1.17	1.62	1.93	1.93	1.93
Urbanization															
Central City	251,000	9	0.45	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,076,000	65	2.39	0.73	0.12	0.07	0.14	0.17	0.26	0.47	0.92	1.34	1.65	6.58	9.16
Suburban	748,000	50	0.86	0.85	0.20	0.14	0.15	0.21	0.38	0.59	1.17	1.36	1.85	13.50	13.50
Race															
Black	63,000	9	0.29	*	*	*	*	*	*	*	*	*	*	*	*
White	2,012,000	115	1.28	0.74	0.11	0.07	0.15	0.18	0.27	0.48	0.90	1.36	1.69	6.58	13.50
Region															
Midwest	665,000	37	1.43	0.79	0.20	0.07	0.14	0.14	0.22	0.34	1.08	1.51	2.10	9.16	9.16
Northeast	87,000	7	0.21	*	*	*	*	*	*	*	*	*	*	*	*
South	823,000	44	1.28	0.54	0.06	0.15	0.18	0.20	0.26	0.36	0.60	1.18	1.62	1.93	1.93
West	500,000	36	1.39	0.92	0.28	0.17	0.21	0.21	0.46	0.67	1.05	1.36	1.36	13.50	13.50
Response to Questionnaire															
Households who raise animals	1,824,000	113	18.06	0.75	0.11	0.07	0.15	0.17	0.26	0.48	0.90	1.36	1.85	6.58	13.50
Households who farm	741,000	44	10.11	0.90	0.17	0.15	0.17	0.18	0.27	0.67	1.19	1.65	1.85	6.58	9.16

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-41. Consumer-Only Intake of Home-Produced Game (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,707,000	185	1.44	0.97	0.06	0.00	0.12	0.21	0.40	0.71	1.22	2.27	2.67	3.61	4.59
Age															
1 to 2	89,000	8	1.56	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	94,000	8	1.16	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	362,000	28	2.17	1.09	0.14	0.12	0.23	0.43	0.63	0.76	1.48	2.67	2.85	2.90	2.90
12 to 19	462,000	27	2.25	1.04	0.14	0.21	0.21	0.29	0.63	0.85	1.22	1.99	3.13	3.13	3.13
20 to 39	844,000	59	1.37	0.82	0.11	0.10	0.12	0.19	0.30	0.63	1.09	1.57	2.50	4.59	4.59
40 to 69	694,000	41	1.22	0.96	0.14	0.12	0.17	0.29	0.34	0.51	1.41	2.51	3.19	3.61	3.61
≥ 70	74,000	7	0.47	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	876,000	31	1.84	1.00	0.16	0.12	0.15	0.22	0.43	0.63	1.19	2.50	3.13	3.19	3.19
Spring	554,000	68	1.20	0.91	0.09	0.00	0.10	0.17	0.44	0.75	1.22	1.75	2.52	3.61	3.61
Summer	273,000	9	0.60	*	*	*	*	*	*	*	*	*	*	*	*
Winter	1,004,000	77	2.06	1.07	0.11	0.00	0.00	0.17	0.39	0.82	1.52	2.20	2.67	4.59	4.59
Urbanization															
Central City	506,000	20	0.90	0.69	0.13	0.00	0.00	0.19	0.28	0.63	0.77	1.48	1.99	2.34	2.34
Non-metropolitan	1,259,000	101	2.80	0.95	0.09	0.00	0.12	0.17	0.32	0.66	1.19	2.27	3.05	4.59	4.59
Suburban	942,000	64	1.09	1.15	0.10	0.00	0.26	0.40	0.52	0.82	1.52	2.51	2.85	3.13	3.61
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	2,605,000	182	1.65	0.98	0.06	0.00	0.12	0.20	0.38	0.73	1.38	2.34	2.85	3.61	4.59
Region															
Midwest	1,321,000	97	2.85	0.88	0.08	0.00	0.08	0.22	0.34	0.61	1.10	1.99	2.51	4.59	4.59
Northeast	394,000	20	0.96	1.13	0.22	0.29	0.29	0.32	0.43	0.77	1.41	3.13	3.13	3.61	3.61
South	609,000	47	0.95	1.26	0.13	0.00	0.12	0.15	0.63	1.09	1.93	2.38	3.19	3.19	3.19
West	383,000	21	1.06	0.63	0.07	0.12	0.15	0.19	0.40	0.63	0.77	1.12	1.22	1.52	1.52
Response to Questionnaire															
Households who hunt	2,357,000	158	11.66	1.04	0.07	0.00	0.14	0.28	0.44	0.75	1.44	2.38	2.90	3.61	4.59

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-42. Consumer-Only Intake of Home-Produced Lettuce (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,520,000	80	0.81	0.39	0.03	0.00	0.04	0.09	0.17	0.28	0.55	0.84	1.03	1.05	1.28
Age															
1 to 2	54,000	4	0.95	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	25,000	2	0.31	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	173,000	7	1.04	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	71,000	3	0.35	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	379,000	17	0.62	*	*	*	*	*	*	*	*	*	*	*	*
40 to 69	485,000	26	0.86	0.48	0.06	0.12	0.12	0.12	0.22	0.49	0.68	0.89	1.05	1.28	1.28
≥ 70	317,000	20	2.00	0.45	0.07	0.05	0.07	0.11	0.22	0.29	0.57	1.03	1.03	1.03	1.03
Season															
Fall	214,000	8	0.45	*	*	*	*	*	*	*	*	*	*	*	*
Spring	352,000	35	0.76	0.45	0.05	0.05	0.07	0.12	0.20	0.45	0.58	0.80	0.99	1.28	1.28
Summer	856,000	30	1.88	0.30	0.04	0.02	0.03	0.05	0.14	0.23	0.42	0.60	0.81	0.89	0.89
Winter	98,000	7	0.20	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	268,000	8	0.48	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	566,000	36	1.26	0.37	0.05	0.02	0.03	0.04	0.12	0.29	0.55	0.81	0.89	1.28	1.28
Suburban	686,000	36	0.79	0.35	0.04	0.00	0.09	0.10	0.15	0.23	0.49	0.77	0.99	1.05	1.05
Race															
Black	51,000	3	0.23	*	*	*	*	*	*	*	*	*	*	*	*
White	1,434,000	75	0.91	0.38	0.03	0.00	0.04	0.09	0.16	0.28	0.55	0.89	1.03	1.05	1.28
Region															
Midwest	630,000	33	1.36	0.38	0.06	0.02	0.03	0.04	0.16	0.23	0.57	0.94	1.03	1.03	1.03
Northeast	336,000	16	0.82	*	*	*	*	*	*	*	*	*	*	*	*
South	305,000	20	0.47	0.35	0.06	0.00	0.00	0.13	0.16	0.28	0.48	0.58	1.04	1.28	1.28
West	249,000	11	0.69	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	1,506,000	78	2.21	0.39	0.03	0.00	0.04	0.09	0.17	0.28	0.55	0.84	1.03	1.05	1.28
Households who farm	304,000	18	4.15	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-43. Consumer-Only Intake of Home-Produced Lima Beans (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,917,000	109	1.02	0.45	0.04	0.00	0.09	0.12	0.19	0.29	0.55	0.99	1.69	1.86	1.91
Age															
1 to 2	62,000	3	1.09	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	35,000	2	0.43	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	95,000	7	0.57	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	108,000	6	0.53	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	464,000	20	0.75	0.38	0.07	0.03	0.11	0.13	0.18	0.23	0.49	0.94	1.10	1.10	1.10
40 to 69	757,000	44	1.33	0.45	0.06	0.09	0.11	0.12	0.20	0.29	0.56	0.87	1.71	1.91	1.91
≥ 70	361,000	25	2.27	0.52	0.11	0.08	0.19	0.19	0.23	0.29	0.64	1.86	1.86	1.86	1.86
Season															
Fall	375,000	14	0.79	*	*	*	*	*	*	*	*	*	*	*	*
Spring	316,000	39	0.68	0.42	0.06	0.08	0.09	0.13	0.23	0.31	0.55	0.75	1.31	1.91	1.91
Summer	883,000	29	1.94	0.50	0.10	0.00	0.09	0.12	0.17	0.29	0.49	1.53	1.71	1.86	1.86
Winter	343,000	27	0.70	0.53	0.06	0.00	0.03	0.11	0.31	0.54	0.76	0.86	0.87	1.69	1.69
Urbanization															
Central City	204,000	8	0.36	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,075,000	69	2.39	0.30	0.03	0.03	0.09	0.12	0.17	0.21	0.32	0.49	0.77	1.69	1.91
Suburban	638,000	32	0.74	0.75	0.10	0.00	0.08	0.09	0.32	0.68	0.99	1.71	1.86	1.86	1.86
Race															
Black	213,000	9	0.98	*	*	*	*	*	*	*	*	*	*	*	*
White	1,704,000	100	1.08	0.38	0.03	0.00	0.09	0.11	0.18	0.25	0.49	0.86	0.99	1.53	1.91
Region															
Midwest	588,000	36	1.27	0.43	0.06	0.00	0.00	0.11	0.25	0.31	0.42	0.99	1.53	1.69	1.69
Northeast	68,000	6	0.17	*	*	*	*	*	*	*	*	*	*	*	*
South	1,261,000	67	1.96	0.47	0.06	0.03	0.10	0.13	0.18	0.25	0.63	1.10	1.71	1.86	1.91
West	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Response to Questionnaire															
Households who garden	1,610,000	97	2.36	0.45	0.04	0.03	0.09	0.12	0.18	0.29	0.53	0.94	1.71	1.86	1.91
Households who farm	62,000	6	0.85	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-44. Consumer-Only Intake of Home-Produced Okra (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,696,000	82	0.90	0.39	0.04	0.00	0.05	0.10	0.15	0.30	0.46	0.78	1.21	1.53	1.53
Age															
1 to 2	53,000	2	0.93	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	68,000	3	0.84	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	218,000	11	1.30	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	194,000	9	0.95	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	417,000	18	0.68	*	*	*	*	*	*	*	*	*	*	*	*
40 to 69	587,000	32	1.03	0.40	0.05	0.07	0.11	0.14	0.25	0.31	0.46	0.78	1.14	1.14	1.14
≥ 70	130,000	6	0.82	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	228,000	9	0.48	*	*	*	*	*	*	*	*	*	*	*	*
Spring	236,000	24	0.51	0.39	0.06	0.03	0.05	0.07	0.11	0.41	0.60	0.78	1.00	1.07	1.07
Summer	1,144,000	41	2.52	0.39	0.06	0.00	0.05	0.10	0.14	0.30	0.44	1.15	1.53	1.53	1.53
Winter	88,000	8	0.18	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	204,000	6	0.36	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,043,000	55	2.32	0.37	0.05	0.00	0.03	0.08	0.15	0.26	0.44	0.78	1.53	1.53	1.53
Suburban	449,000	21	0.52	0.51	0.07	0.07	0.10	0.11	0.31	0.46	0.60	1.14	1.15	1.15	1.15
Race															
Black	236,000	13	1.09	*	*	*	*	*	*	*	*	*	*	*	*
White	1,419,000	68	0.90	0.43	0.04	0.00	0.07	0.10	0.18	0.33	0.52	1.14	1.21	1.53	1.53
Region															
Midwest	113,000	7	0.24	*	*	*	*	*	*	*	*	*	*	*	*
Northeast															
South	1,443,000	70	2.24	0.37	0.04	0.00	0.05	0.08	0.14	0.26	0.44	0.75	1.21	1.53	1.53
West	140,000	5	0.39	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	1,564,000	77	2.29	0.38	0.04	0.00	0.05	0.10	0.15	0.30	0.45	1.07	1.21	1.53	1.53
Households who farm	233,000	14	3.18	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-45. Consumer-Only Intake of Home-Produced Onions (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	6,718,000	370	3.57	0.30	0.02	0.00	0.01	0.03	0.09	0.21	0.38	0.61	0.91	1.49	3.11
Age															
1 to 2	291,000	17	5.11	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	178,000	9	2.20	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	530,000	31	3.17	0.30	0.06	0.01	0.01	0.03	0.11	0.23	0.38	0.61	1.36	1.36	1.36
12 to 19	652,000	37	3.18	0.21	0.04	0.01	0.01	0.01	0.06	0.14	0.26	0.57	0.76	0.91	0.91
20 to 39	1,566,000	78	2.54	0.29	0.03	0.01	0.04	0.06	0.09	0.19	0.30	0.64	0.94	1.49	1.49
40 to 69	2,402,000	143	4.23	0.25	0.02	0.00	0.00	0.01	0.08	0.17	0.36	0.55	0.69	1.11	1.41
≥ 70	1,038,000	52	6.54	0.43	0.09	0.00	0.01	0.03	0.14	0.29	0.46	0.56	2.68	3.11	3.11
Season															
Fall	1,557,000	59	3.27	0.38	0.07	0.00	0.03	0.06	0.12	0.26	0.44	0.60	0.78	3.11	3.11
Spring	1,434,000	147	3.11	0.20	0.02	0.00	0.01	0.03	0.06	0.11	0.26	0.43	0.52	1.41	1.77
Summer	2,891,000	101	6.36	0.31	0.03	0.01	0.02	0.04	0.11	0.23	0.38	0.69	0.97	1.49	1.49
Winter	836,000	63	1.72	0.29	0.04	0.00	0.00	0.01	0.03	0.20	0.46	0.64	0.92	1.36	1.36
Urbanization															
Central City	890,000	37	1.58	0.22	0.03	0.00	0.01	0.03	0.07	0.19	0.30	0.52	0.56	0.56	0.56
Non-metropolitan	2,944,000	177	6.54	0.32	0.02	0.01	0.03	0.07	0.14	0.26	0.43	0.63	0.91	1.49	1.77
Suburban	2,884,000	156	3.33	0.29	0.04	0.00	0.01	0.01	0.06	0.13	0.36	0.64	0.97	3.11	3.11
Race															
Black	253,000	16	1.16	*	*	*	*	*	*	*	*	*	*	*	*
White	6,266,000	345	3.98	0.31	0.02	0.00	0.01	0.03	0.09	0.22	0.39	0.62	0.94	1.77	3.11
Region															
Midwest	2,487,000	143	5.36	0.27	0.02	0.00	0.04	0.06	0.10	0.22	0.34	0.56	0.72	1.34	1.34
Northeast	876,000	52	2.13	0.23	0.04	0.00	0.00	0.01	0.01	0.11	0.35	0.64	1.05	1.36	1.41
South	1,919,000	107	2.98	0.33	0.03	0.00	0.03	0.04	0.15	0.25	0.39	0.69	1.08	1.49	1.77
West	1,436,000	68	3.98	0.33	0.07	0.00	0.01	0.02	0.06	0.15	0.39	0.55	0.97	3.11	3.11
Response to Questionnaire															
Households who garden	6,441,000	356	9.45	0.30	0.02	0.00	0.01	0.03	0.09	0.21	0.38	0.61	0.92	1.77	3.11
Households who farm	1,390,000	81	18.97	0.38	0.04	0.03	0.04	0.05	0.11	0.28	0.52	0.94	1.11	1.49	1.49

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-46. Consumer-Only Intake of Home-Produced Other Berries (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,626,000	99	0.86	0.48	0.04	0.00	0.05	0.09	0.23	0.38	0.59	1.07	1.28	2.21	2.21
Age															
1 to 2	41,000	2	0.72	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	53,000	3	0.65	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	106,000	10	0.63	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	79,000	5	0.39	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	309,000	20	0.50	0.39	0.06	0.08	0.09	0.09	0.13	0.33	0.55	0.79	1.07	1.07	1.07
40 to 69	871,000	51	1.54	0.49	0.06	0.08	0.10	0.13	0.25	0.39	0.61	0.77	1.28	2.21	2.21
≥ 70	159,000	7	1.00	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	379,000	13	0.80	*	*	*	*	*	*	*	*	*	*	*	*
Spring	287,000	29	0.62	0.31	0.04	0.05	0.05	0.08	0.18	0.25	0.41	0.54	0.72	1.07	1.07
Summer	502,000	18	1.10	*	*	*	*	*	*	*	*	*	*	*	*
Winter	458,000	39	0.94	0.54	0.07	0.00	0.10	0.16	0.23	0.39	0.62	1.07	1.95	2.08	2.08
Urbanization															
Central City	378,000	15	0.67	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	466,000	37	1.04	0.64	0.09	0.00	0.09	0.10	0.25	0.44	1.02	1.31	2.21	2.21	2.21
Suburban	722,000	45	0.83	0.45	0.05	0.09	0.13	0.16	0.26	0.38	0.54	0.59	0.90	2.08	2.08
Race															
Black	76,000	4	0.35	*	*	*	*	*	*	*	*	*	*	*	*
White	1,490,000	93	0.95	0.50	0.04	0.05	0.09	0.10	0.25	0.40	0.60	1.07	1.31	2.21	2.21
Region															
Midwest	736,000	56	1.59	0.46	0.06	0.00	0.08	0.09	0.13	0.30	0.59	1.12	1.28	2.21	2.21
Northeast	211,000	11	0.51	*	*	*	*	*	*	*	*	*	*	*	*
South	204,000	12	0.32	*	*	*	*	*	*	*	*	*	*	*	*
West	415,000	18	1.15	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	1,333,000	84	1.96	0.47	0.05	0.01	0.00	0.09	0.20	0.35	0.55	1.07	1.28	2.21	2.21
Households who farm	219,000	16	2.99	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-47. Consumer-Only Intake of Home-Produced Peaches (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,941,000	193	1.56	1.67	0.17	0.05	0.17	0.23	0.47	0.90	1.88	3.79	6.36	12.30	22.30
Age															
1 to 2	103,000	8	1.81	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	65,000	6	0.80	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	329,000	26	1.97	3.11	0.63	0.10	0.10	0.14	0.63	1.13	6.36	8.53	8.53	11.50	11.50
12 to 19	177,000	13	0.86	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	573,000	35	0.93	1.17	0.17	0.05	0.06	0.23	0.47	0.81	1.30	2.92	2.99	5.27	5.27
40 to 69	1,076,000	70	1.90	1.53	0.28	0.06	0.19	0.24	0.56	0.89	1.61	2.63	4.43	12.30	12.30
≥ 70	598,000	33	3.77	1.01	0.20	0.09	0.14	0.18	0.28	0.82	1.19	1.60	3.79	7.13	7.13
Season															
Fall	485,000	19	1.02	*	*	*	*	*	*	*	*	*	*	*	*
Spring	756,000	91	1.64	1.67	0.30	0.05	0.06	0.10	0.28	0.77	1.45	4.44	6.77	22.30	22.30
Summer	1,081,000	35	2.38	2.26	0.48	0.17	0.23	0.36	0.57	1.12	2.99	6.36	8.53	12.30	12.30
Winter	619,000	48	1.27	1.25	0.10	0.04	0.24	0.56	0.78	1.04	1.71	2.35	2.60	3.56	3.56
Urbanization															
Central City	429,000	12	0.76	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,110,000	99	2.47	1.87	0.26	0.06	0.26	0.39	0.65	1.02	2.18	3.86	6.36	11.50	22.30
Suburban	1,402,000	82	1.62	1.47	0.18	0.05	0.14	0.20	0.46	0.92	1.87	3.79	4.43	7.37	7.37
Race															
Black	39,000	1	0.18	*	*	*	*	*	*	*	*	*	*	*	*
White	2,861,000	191	1.82	1.70	0.17	0.05	0.17	0.23	0.50	0.90	1.96	3.79	6.36	12.30	22.30
Region															
Midwest	824,000	75	1.78	1.39	0.29	0.18	0.22	0.26	0.46	0.74	1.19	3.06	3.56	11.50	22.30
Northeast	75,000	5	0.18	*	*	*	*	*	*	*	*	*	*	*	*
South	852,000	51	1.32	1.67	0.26	0.04	0.14	0.18	0.64	1.02	1.96	3.83	6.36	8.53	8.53
West	1,190,000	62	3.30	1.80	0.33	0.05	0.14	0.23	0.47	0.86	1.94	4.43	7.37	12.30	12.30
Response to Questionnaire															
Households who garden	2,660,000	174	3.90	1.75	0.19	0.05	0.17	0.26	0.53	0.93	1.96	3.79	6.36	12.30	22.30
Households who farm	769,000	54	10.49	1.56	0.25	0.07	0.18	0.23	0.46	0.90	2.02	2.99	6.36	8.53	8.53

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-48. Consumer-Only Intake of Home-Produced Pears (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,513,000	94	0.80	0.94	0.10	0.10	0.18	0.24	0.43	0.68	1.09	1.60	2.76	5.16	5.16
Age															
1 to 2	24,000	3	0.42	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	45,000	3	0.56	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	145,000	10	0.87	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	121,000	7	0.59	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	365,000	23	0.59	0.62	0.06	0.11	0.32	0.38	0.43	0.50	0.68	1.22	1.24	1.24	1.24
40 to 69	557,000	33	0.98	0.66	0.06	0.10	0.11	0.33	0.42	0.65	0.92	1.10	1.13	1.51	1.51
≥ 70	256,000	15	1.61	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	308,000	11	0.65	*	*	*	*	*	*	*	*	*	*	*	*
Spring	355,000	39	0.77	0.69	0.08	0.10	0.11	0.18	0.34	0.60	0.87	1.15	1.83	2.54	2.54
Summer	474,000	16	1.04	*	*	*	*	*	*	*	*	*	*	*	*
Winter	376,000	28	0.77	1.48	0.28	0.11	0.11	0.38	0.65	0.95	1.38	4.82	5.16	5.16	5.16
Urbanization															
Central City	222,000	11	0.39	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	634,000	44	1.41	0.78	0.09	0.33	0.35	0.42	0.44	0.57	0.81	1.56	1.86	2.88	2.88
Suburban	657,000	39	0.76	0.85	0.12	0.10	0.11	0.18	0.39	0.73	1.10	1.50	2.57	4.79	4.79
Race															
Black	51,000	3	0.23	*	*	*	*	*	*	*	*	*	*	*	*
White	1,462,000	91	0.93	0.97	0.10	0.11	0.24	0.35	0.44	0.70	1.09	1.60	2.88	5.16	5.16
Region															
Midwest	688,000	57	1.48	0.87	0.09	0.22	0.34	0.38	0.44	0.65	1.04	1.60	2.57	4.79	4.79
Northeast	18,000	2	0.04	*	*	*	*	*	*	*	*	*	*	*	*
South	377,000	13	0.59	*	*	*	*	*	*	*	*	*	*	*	*
West	430,000	22	1.19	1.14	0.29	0.10	0.11	0.11	0.36	0.75	1.13	2.76	4.82	5.16	5.16
Response to Questionnaire															
Households who garden	1,312,000	85	1.93	0.95	0.10	0.10	0.18	0.35	0.43	0.68	1.09	1.56	2.88	5.16	5.16
Households who farm	528,000	35	7.20	1.09	0.21	0.11	0.22	0.38	0.43	0.61	1.09	2.76	4.82	5.16	5.16

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-49. Consumer-Only Intake of Home-Produced Peas (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	4,252,000	226	2.26	0.51	0.03	0.05	0.10	0.14	0.23	0.32	0.62	1.04	1.46	2.66	2.89
Age															
1 to 2	163,000	9	2.86	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	140,000	7	1.73	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	515,000	26	3.08	0.61	0.09	0.15	0.15	0.22	0.30	0.39	0.90	1.35	1.40	2.06	2.06
12 to 19	377,000	22	1.84	0.41	0.04	0.06	0.13	0.16	0.24	0.36	0.50	0.71	0.82	0.82	0.82
20 to 39	1,121,000	52	1.82	0.41	0.06	0.10	0.12	0.14	0.18	0.25	0.41	0.85	1.36	2.71	2.71
40 to 69	1,366,000	80	2.41	0.46	0.05	0.07	0.10	0.12	0.23	0.30	0.61	1.00	1.30	2.36	2.36
≥ 70	458,000	26	2.88	0.33	0.06	0.03	0.03	0.05	0.18	0.27	0.37	1.00	1.00	1.46	1.46
Season															
Fall	1,239,000	41	2.60	0.30	0.03	0.03	0.05	0.12	0.21	0.26	0.35	0.60	0.71	1.00	1.00
Spring	765,000	78	1.66	0.44	0.04	0.06	0.11	0.12	0.19	0.33	0.52	0.92	1.40	2.06	2.06
Summer	1,516,000	51	3.33	0.59	0.07	0.07	0.13	0.17	0.22	0.39	0.82	1.35	1.60	2.66	2.66
Winter	732,000	56	1.50	0.75	0.09	0.12	0.18	0.21	0.27	0.54	0.95	1.54	2.36	2.89	2.89
Urbanization															
Central City	558,000	19	0.99	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	2,028,000	126	4.50	0.48	0.04	0.08	0.14	0.17	0.25	0.35	0.58	1.04	1.36	1.89	2.89
Suburban	1,666,000	81	1.92	0.51	0.05	0.07	0.12	0.13	0.23	0.39	0.68	1.00	1.30	2.28	2.36
Race															
Black	355,000	19	1.63	*	*	*	*	*	*	*	*	*	*	*	*
White	3,784,000	203	2.40	0.50	0.03	0.03	0.10	0.13	0.22	0.33	0.60	1.00	1.40	2.66	2.89
Region															
Midwest	1,004,000	55	2.16	0.40	0.07	0.03	0.05	0.10	0.14	0.25	0.35	0.88	1.54	2.71	2.89
Northeast	241,000	14	0.59	*	*	*	*	*	*	*	*	*	*	*	*
South	2,449,000	132	3.81	0.57	0.04	0.13	0.17	0.20	0.26	0.37	0.68	1.24	1.60	2.66	2.66
West	558,000	25	1.55	0.38	0.06	0.07	0.07	0.10	0.22	0.27	0.48	0.90	0.94	1.40	1.40
Response to Questionnaire															
Households who garden	3,980,000	214	5.84	0.51	0.03	0.03	0.10	0.14	0.23	0.32	0.63	1.04	1.54	2.66	2.89
Households who farm	884,000	55	12.06	0.46	0.06	0.03	0.05	0.09	0.21	0.35	0.52	0.90	1.40	1.60	2.89

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-50. Consumer-Only Intake of Home-Produced Peppers (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	5,153,000	208	2.74												
Age															
1 to 2	163,000	6	2.86	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	108,000	5	1.33	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	578,000	26	3.46	0.23	0.04	0.00	0.00	0.03	0.09	0.16	0.30	0.43	0.77	0.85	0.85
12 to 19	342,000	16	1.67	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	1,048,000	40	1.70	0.22	0.06	0.02	0.03	0.06	0.09	0.12	0.22	0.40	0.62	2.48	2.48
40 to 69	2,221,000	88	3.92	0.25	0.03	0.01	0.03	0.05	0.08	0.17	0.32	0.48	0.74	1.50	1.50
≥ 70	646,000	25	4.07	0.26	0.06	0.02	0.02	0.02	0.07	0.14	0.24	0.92	0.94	1.07	1.07
Season															
Fall	1,726,000	53	3.62	0.20	0.03	0.00	0.03	0.04	0.09	0.17	0.24	0.35	0.40	1.07	1.07
Spring	255,000	28	0.55	0.30	0.07	0.00	0.02	0.04	0.07	0.15	0.32	1.09	1.20	1.53	1.53
Summer	2,672,000	94	5.87												
Winter	500,000	33	1.03												
Urbanization															
Central City	865,000	30	1.53	0.25	0.04	0.04	0.06	0.07	0.11	0.18	0.27	0.36	0.94	1.10	1.10
Non-metropolitan	1,982,000	89	4.40	0.24	0.04	0.01	0.02	0.03	0.07	0.12	0.27	0.54	0.77	2.48	2.48
Suburban	2,246,000	87	2.59	0.25	0.03	0.00	0.03	0.04	0.09	0.16	0.29	0.49	0.97	1.50	1.53
Race															
Black	127,000	6	0.58	*	*	*	*	*	*	*	*	*	*	*	*
White	4,892,000	198	3.11	0.25	0.02	0.02	0.03	0.04	0.09	0.15	0.29	0.49	0.92	1.81	2.48
Region															
Midwest	1,790,000	74	3.86	0.23	0.04	0.01	0.02	0.03	0.06	0.15	0.26	0.39	0.85	2.48	2.48
Northeast	786,000	31	1.91												
South	1,739,000	72	2.70	0.23	0.03	0.03	0.07	0.08	0.11	0.17	0.27	0.43	0.53	1.81	1.81
West	778,000	29	2.16	0.21	0.05	0.02	0.02	0.03	0.04	0.09	0.25	0.54	0.92	1.07	1.07
Response to Questionnaire															
Households who garden	4,898,000	199	7.19	0.24	0.02	0.00	0.02	0.03	0.08	0.15	0.29	0.48	0.85	1.50	2.48
Households who farm	867,000	35	11.83	0.30	0.08	0.00	0.03	0.03	0.07	0.17	0.36	0.60	0.85	2.48	2.48

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-51. Consumer-Only Intake of Home-Produced Pork (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,732,000	121	0.92	1.23	0.10	0.09	0.14	0.31	0.54	0.90	1.71	2.73	3.37	4.93	7.41
Age															
1 to 2	38,000	5	0.67	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	26,000	3	0.32	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	129,000	11	0.77	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	291,000	20	1.42	1.28	0.24	0.31	0.32	0.34	0.52	0.89	1.75	3.69	3.69	4.29	4.29
20 to 39	511,000	32	0.83	1.21	0.18	0.11	0.28	0.41	0.55	0.79	1.43	2.90	3.08	4.93	4.93
40 to 69	557,000	38	0.98	1.02	0.12	0.12	0.18	0.22	0.41	0.81	1.71	1.78	2.28	3.16	3.16
≥ 70	180,000	12	1.13	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	362,000	13	0.76	*	*	*	*	*	*	*	*	*	*	*	*
Spring	547,000	59	1.19	1.13	0.13	0.11	0.14	0.22	0.35	0.90	1.50	2.68	3.68	4.29	4.29
Summer	379,000	15	0.83	*	*	*	*	*	*	*	*	*	*	*	*
Winter	444,000	34	0.91	1.40	0.24	0.13	0.26	0.38	0.50	0.88	2.21	3.08	4.93	7.41	7.41
Urbanization															
Central City	90,000	2	0.16	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	1,178,000	77	2.62	1.39	0.13	0.09	0.22	0.41	0.62	0.97	1.75	3.16	3.69	4.93	7.41
Suburban	464,000	42	0.54	0.88	0.12	0.11	0.12	0.18	0.33	0.59	1.10	2.28	2.73	2.90	2.90
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	1,732,000	121	1.10	1.23	0.10	0.09	0.14	0.31	0.54	0.90	1.71	2.73	3.37	4.93	7.41
Region															
Midwest	844,000	64	1.82	1.06	0.12	0.09	0.12	0.21	0.50	0.67	1.20	2.68	3.37	3.69	3.73
Northeast	97,000	5	0.24	*	*	*	*	*	*	*	*	*	*	*	*
South	554,000	32	0.86	1.35	0.15	0.18	0.26	0.34	0.81	1.26	1.75	2.44	3.08	4.29	4.29
West	237,000	20	0.66	1.15	0.31	0.13	0.32	0.38	0.44	0.73	1.10	1.75	2.73	7.41	7.41
Response to Questionnaire															
Households who raise animals	1,428,000	100	14.14	1.34	0.10	0.14	0.32	0.41	0.59	0.97	1.75	2.90	3.37	4.29	4.93
Households who farm	1,218,000	82	16.62	1.30	0.11	0.22	0.34	0.41	0.59	0.92	1.71	3.08	3.69	4.93	4.93

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-52. Consumer-Only Intake of Home-Produced Poultry (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	1,816,000	105	0.97	1.57	0.12	0.20	0.30	0.42	0.64	1.23	2.19	3.17	3.83	5.33	6.17
Age															
1 to 2	91,000	8	1.60	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	70,000	5	0.86	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	205,000	12	1.23	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	194,000	12	0.95	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	574,000	33	0.93	1.17	0.15	0.17	0.40	0.40	0.56	1.15	1.37	1.80	2.93	4.59	4.59
40 to 69	568,000	30	1.00	1.51	0.24	0.20	0.20	0.30	0.49	0.77	2.69	3.29	4.60	5.15	5.15
≥ 70	80,000	3	0.50	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	562,000	23	1.18	1.52	0.18	0.41	0.42	0.46	0.81	1.39	2.23	2.69	3.17	3.17	3.17
Spring	374,000	34	0.81	1.87	0.28	0.17	0.23	0.30	0.52	1.38	3.29	4.60	5.15	5.33	5.33
Summer	312,000	11	0.69	*	*	*	*	*	*	*	*	*	*	*	*
Winter	568,000	37	1.17	1.55	0.20	0.20	0.20	0.43	0.60	1.23	2.18	2.95	3.47	6.17	6.17
Urbanization															
Central City	230,000	8	0.41	*	*	*	*	*	*	*	*	*	*	*	*
Non-metropolitan	997,000	56	2.21	1.48	0.13	0.20	0.28	0.41	0.67	1.19	2.10	3.17	3.29	3.86	5.33
Suburban	589,000	41	0.68	1.94	0.23	0.23	0.27	0.43	0.62	1.59	2.69	4.59	4.83	6.17	6.17
Race															
Black	44,000	2	0.20	*	*	*	*	*	*	*	*	*	*	*	*
White	1,772,000	103	1.12	1.57	0.12	0.20	0.30	0.42	0.62	1.23	2.19	3.17	3.86	5.33	6.17
Region															
Midwest	765,000	41	1.65	1.60	0.14	0.41	0.42	0.56	0.98	1.39	2.19	2.70	3.17	3.86	5.33
Northeast	64,000	4	0.16	*	*	*	*	*	*	*	*	*	*	*	*
South	654,000	38	1.02	1.67	0.25	0.17	0.20	0.30	0.46	0.91	2.11	4.59	4.83	6.17	6.17
West	333,000	22	0.92	1.24	0.18	0.27	0.27	0.43	0.56	1.02	1.89	2.45	2.93	2.93	2.93
Response to Questionnaire															
Households who raise animals	1,333,000	81	13.20	1.58	0.12	0.23	0.41	0.47	0.71	1.37	2.19	2.93	3.29	5.33	6.17
Households who farm	917,000	59	12.51	1.54	0.18	0.20	0.23	0.30	0.60	1.06	2.18	3.47	4.83	6.17	6.17

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-53. Consumer-Only Intake of Home-Produced Pumpkins (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,041,000	87	1.09	0.78	0.07	0.13	0.18	0.24	0.32	0.56	1.07	1.47	1.79	3.02	4.48
Age															
1 to 2	73,000	4	1.28	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	18,000	2	0.22	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	229,000	9	1.37	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	244,000	10	1.19	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	657,000	26	1.07	0.80	0.13	0.18	0.18	0.30	0.38	0.48	1.03	1.73	2.67	2.67	2.67
40 to 69	415,000	20	0.73	0.82	0.16	0.29	0.29	0.32	0.37	0.52	0.96	1.47	3.02	3.02	3.02
≥ 70	373,000	15	2.35	*	*	*	*	*	*	*	*	*	*	*	*
Season															
Fall	1,345,000	49	2.82	0.82	0.09	0.13	0.18	0.28	0.37	0.61	1.17	1.73	1.79	3.02	3.02
Spring	48,000	6	0.10	*	*	*	*	*	*	*	*	*	*	*	*
Summer	405,000	13	0.89	*	*	*	*	*	*	*	*	*	*	*	*
Winter	243,000	19	0.50	*	*	*	*	*	*	*	*	*	*	*	*
Urbanization															
Central City	565,000	20	1.00	0.63	0.11	0.18	0.18	0.24	0.28	0.38	0.94	1.24	1.33	2.24	2.24
Non-metropolitan	863,000	44	1.92	0.64	0.10	0.13	0.17	0.19	0.31	0.51	0.67	1.22	1.45	4.48	4.48
Suburban	613,000	23	0.71	1.10	0.13	0.29	0.29	0.30	0.47	1.04	1.47	1.79	2.67	2.67	2.67
Race															
Black	22,000	1	0.10	*	*	*	*	*	*	*	*	*	*	*	*
White	2,019,000	86	1.28	0.78	0.07	0.13	0.18	0.24	0.32	0.56	1.10	1.47	1.79	3.02	4.48
Region															
Midwest	1,370,000	54	2.95	0.82	0.10	0.13	0.23	0.24	0.32	0.57	1.04	1.73	2.67	3.02	4.48
Northeast	15,000	1	0.04	*	*	*	*	*	*	*	*	*	*	*	*
South	179,000	10	0.28	*	*	*	*	*	*	*	*	*	*	*	*
West	477,000	22	1.32	0.79	0.10	0.18	0.19	0.31	0.37	0.74	1.17	1.47	1.51	1.51	1.51
Response to Questionnaire															
Households who garden	1,987,000	85	2.92	0.77	0.07	0.13	0.18	0.24	0.32	0.56	1.04	1.46	1.79	3.02	4.48
Households who farm	449,000	18	6.13	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-54. Consumer-Only Intake of Home-Produced Snap Beans (g/kg-day)

Population Group	Nc wgtd	Nc Unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	12,308,000	739	6.55	0.80	0.03	0.06	0.15	0.19	0.34	0.57	1.04	1.58	2.01	3.90	9.96
Age															
1 to 2	246,000	17	4.32	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	455,000	32	5.62	1.49	0.24	0.00	0.00	0.35	0.90	1.16	1.66	3.20	4.88	6.90	6.90
6 to 11	862,000	62	5.16	0.90	0.12	0.00	0.20	0.22	0.32	0.64	1.21	1.79	2.75	4.81	5.66
12 to 19	1,151,000	69	5.62	0.64	0.06	0.00	0.16	0.22	0.32	0.50	0.81	1.34	1.79	2.72	2.72
20 to 39	2,677,000	160	4.35	0.61	0.04	0.07	0.13	0.16	0.26	0.50	0.79	1.24	1.64	2.05	4.26
40 to 69	4,987,000	292	8.79	0.72	0.03	0.10	0.16	0.23	0.36	0.56	0.86	1.45	1.77	2.70	4.23
≥ 70	1,801,000	100	11.34	0.92	0.12	0.06	0.07	0.15	0.37	0.64	1.22	1.70	2.01	9.96	9.96
Season															
Fall	3,813,000	137	8.00	0.81	0.08	0.06	0.15	0.18	0.27	0.54	1.18	1.52	2.01	4.82	9.96
Spring	2,706,000	288	5.86	0.90	0.05	0.03	0.15	0.22	0.37	0.59	1.11	1.72	2.85	5.66	6.90
Summer	2,946,000	98	6.48	0.63	0.05	0.00	0.12	0.16	0.33	0.50	0.85	1.30	1.70	2.05	2.63
Winter	2,843,000	216	5.84	0.86	0.05	0.11	0.18	0.24	0.42	0.62	1.12	1.72	2.02	3.85	7.88
Urbanization															
Central City	2,205,000	78	3.91	0.60	0.06	0.06	0.07	0.16	0.26	0.51	0.71	1.23	1.54	1.93	3.35
Non-metropolitan	5,696,000	404	12.65	0.96	0.05	0.09	0.18	0.23	0.37	0.68	1.19	1.89	2.70	4.88	9.96
Suburban	4,347,000	255	5.02	0.70	0.04	0.10	0.14	0.19	0.34	0.52	0.93	1.36	1.77	2.98	6.08
Race															
Black	634,000	36	2.92	0.76	0.14	0.25	0.25	0.28	0.30	0.48	1.04	1.30	1.34	5.98	5.98
White	11,519,000	694	7.31	0.81	0.03	0.07	0.15	0.19	0.35	0.57	1.06	1.63	2.01	3.90	9.96
Region															
Midwest	4,651,000	307	10.02	0.86	0.06	0.07	0.15	0.19	0.34	0.55	0.99	1.70	2.47	4.88	9.96
Northeast	990,000	52	2.40	0.57	0.07	0.00	0.10	0.11	0.18	0.49	0.82	1.28	1.36	1.97	3.09
South	4,755,000	286	7.39	0.88	0.04	0.13	0.21	0.25	0.40	0.68	1.22	1.72	2.01	3.23	5.98
West	1,852,000	92	5.14	0.59	0.04	0.07	0.14	0.18	0.27	0.51	0.74	1.20	1.52	2.19	2.19
Response to Questionnaire															
Households who garden	11,843,000	700	17.38	0.79	0.03	0.06	0.15	0.19	0.33	0.56	1.02	1.60	2.01	3.85	9.96
Households who farm	2,591,000	157	35.35	0.80	0.05	0.06	0.13	0.19	0.41	0.66	1.12	1.54	1.98	2.96	4.23

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-55. Consumer-Only Intake of Home-Produced Strawberries (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,057,000	139	1.09	0.65	0.05	0.04	0.08	0.12	0.26	0.47	0.82	1.47	1.77	2.72	4.83
Age															
1 to 2	30,000	2	0.53	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	66,000	6	0.81	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	153,000	15	0.92	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	201,000	11	0.98	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	316,000	22	0.51	0.32	0.06	0.08	0.08	0.11	0.12	0.21	0.46	0.82	0.97	1.56	1.56
40 to 69	833,000	55	1.47	0.64	0.06	0.02	0.07	0.18	0.36	0.58	0.94	1.42	1.47	2.37	2.37
≥ 70	449,000	27	2.83	0.64	0.11	0.04	0.04	0.09	0.26	0.47	0.70	1.66	1.89	2.72	2.72
Season															
Fall	250,000	8	0.52	*	*	*	*	*	*	*	*	*	*	*	*
Spring	598,000	66	1.30	0.83	0.10	0.08	0.09	0.18	0.28	0.47	0.97	1.93	2.54	4.83	4.83
Summer	388,000	11	0.85	*	*	*	*	*	*	*	*	*	*	*	*
Winter	821,000	54	1.69	0.51	0.06	0.02	0.04	0.11	0.21	0.39	0.60	1.27	1.46	2.37	2.37
Urbanization															
Central City	505,000	23	0.90	0.75	0.12	0.04	0.04	0.09	0.38	0.49	1.33	1.47	1.69	2.37	2.37
Non-metropolitan	664,000	52	1.47	0.62	0.11	0.02	0.07	0.08	0.13	0.39	0.81	1.66	2.16	4.83	4.83
Suburban	888,000	64	1.03	0.62	0.06	0.08	0.18	0.22	0.35	0.53	0.70	1.27	1.56	2.97	2.97
Race															
Black	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
White	2,057,000	139	1.31	0.65	0.05	0.04	0.08	0.12	0.26	0.47	0.82	1.47	1.77	2.72	4.83
Region															
Midwest	1,123,000	76	2.42	0.69	0.08	0.02	0.07	0.08	0.18	0.42	1.00	1.66	1.93	2.97	4.83
Northeast	382,000	25	0.93	0.64	0.10	0.09	0.16	0.18	0.26	0.47	0.87	1.46	1.83	2.16	2.16
South	333,000	23	0.52	0.67	0.08	0.13	0.21	0.38	0.52	0.62	0.70	1.00	1.00	2.72	2.72
West	219,000	15	0.61	*	*	*	*	*	*	*	*	*	*	*	*
Response to Questionnaire															
Households who garden	1,843,000	123	2.70	0.64	0.05	0.04	0.08	0.12	0.23	0.45	0.82	1.46	1.77	2.54	4.83
Households who farm	87,000	9	1.19	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Sandard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-56. Consumer-Only Intake of Home-Produced Tomatoes (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	16,737,000	743	8.90	1.18	0.05	0.08	0.15	0.23	0.39	0.74	1.46	2.50	3.54	7.26	19.30
Age															
1 to 2	572,000	26	10.04	3.14	0.53	0.73	0.86	0.93	1.23	1.66	4.00	7.26	10.70	10.70	10.70
3 to 5	516,000	26	6.37	1.61	0.27	0.50	0.51	0.51	0.75	1.25	1.65	3.00	6.25	6.25	6.25
6 to 11	1,093,000	51	6.54	1.63	0.27	0.22	0.31	0.39	0.53	0.76	1.66	5.20	5.70	9.14	9.14
12 to 19	1,411,000	61	6.89	0.72	0.09	0.00	0.00	0.18	0.27	0.52	0.85	1.67	1.94	3.39	3.39
20 to 39	4,169,000	175	6.77	0.85	0.10	0.07	0.13	0.15	0.25	0.52	1.00	1.83	2.10	5.52	19.30
40 to 69	6,758,000	305	11.92	1.05	0.05	0.11	0.17	0.28	0.40	0.75	1.41	2.40	3.05	4.50	5.00
≥ 70	1,989,000	89	12.53	1.26	0.09	0.11	0.24	0.30	0.48	1.14	1.77	2.51	2.99	3.67	3.67
Season															
Fall	5,516,000	201	11.57	1.02	0.09	0.07	0.14	0.22	0.34	0.60	1.34	2.24	2.87	6.25	10.70
Spring	1,264,000	127	2.74	0.84	0.06	0.14	0.19	0.24	0.37	0.63	1.11	1.75	2.00	3.79	5.28
Summer	8,122,000	279	17.86	1.30	0.09	0.11	0.17	0.24	0.41	0.80	1.55	3.05	4.05	7.26	10.90
Winter	1,835,000	136	3.77	1.37	0.18	0.09	0.21	0.29	0.50	0.83	1.49	2.48	3.38	8.29	19.30
Urbanization															
Central City	2,680,000	90	4.76	1.10	0.13	0.00	0.15	0.23	0.35	0.75	1.51	2.16	2.95	7.26	8.29
Non-metropolitan	7,389,000	378	16.41	1.26	0.07	0.11	0.22	0.26	0.42	0.76	1.47	2.77	3.85	6.87	10.70
Suburban	6,668,000	275	7.70	1.13	0.09	0.08	0.14	0.18	0.37	0.67	1.38	2.35	3.32	5.52	19.30
Race															
Black	743,000	28	3.42	0.61	0.09	0.00	0.00	0.07	0.24	0.51	0.90	1.18	1.55	1.66	1.66
White	15,658,000	703	9.94	1.22	0.06	0.11	0.17	0.24	0.41	0.76	1.49	2.55	3.59	7.26	19.30
Region															
Midwest	6,747,000	322	14.54	1.18	0.09	0.06	0.15	0.21	0.36	0.68	1.41	2.51	3.69	6.87	19.30
Northeast	2,480,000	87	6.02	1.17	0.16	0.08	0.14	0.15	0.35	0.75	1.38	2.44	3.52	10.90	10.90
South	4,358,000	202	6.77	1.15	0.09	0.00	0.21	0.25	0.42	0.75	1.43	2.32	3.67	6.82	9.14
West	3,152,000	132	8.74	1.23	0.10	0.18	0.24	0.28	0.41	0.77	1.84	2.78	3.08	7.26	7.26
Response to Questionnaire															
Households who garden	14,791,000	661	21.70	1.21	0.06	0.08	0.15	0.23	0.41	0.76	1.50	2.51	3.52	7.26	19.30
Households who farm	2,269,000	112	30.96	1.42	0.16	0.00	0.18	0.23	0.42	0.77	1.86	3.55	5.20	9.14	9.14

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-57. Consumer-Only Intake of Home-Produced White Potatoes (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	5,895,000	281	3.14	1.66	0.11	0.00	0.19	0.31	0.55	1.27	2.07	3.11	4.76	9.52	12.80
Age															
1 to 2	147,000	10	2.58	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	119,000	6	1.47	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	431,000	24	2.58	2.19	0.39	0.00	0.00	0.41	0.72	1.76	3.10	5.94	6.52	6.52	6.52
12 to 19	751,000	31	3.67	1.26	0.19	0.07	0.19	0.26	0.38	1.22	1.80	2.95	3.11	4.14	4.14
20 to 39	1,501,000	66	2.44	1.24	0.12	0.16	0.16	0.20	0.48	1.00	1.62	2.54	3.08	4.29	5.09
40 to 69	1,855,000	95	3.27	1.86	0.23	0.13	0.26	0.35	0.70	1.31	2.04	3.43	5.29	12.80	12.80
≥ 70	1,021,000	45	6.43	1.27	0.12	0.21	0.22	0.36	0.55	1.21	1.69	2.35	2.88	3.92	3.92
Season															
Fall	2,267,000	86	4.76	1.63	0.22	0.16	0.22	0.27	0.46	1.13	1.79	3.43	4.14	12.80	12.80
Spring	527,000	58	1.14	1.23	0.13	0.07	0.11	0.20	0.41	0.86	1.91	2.86	3.08	4.28	4.28
Summer	2,403,000	81	5.28	1.63	0.18	0.00	0.19	0.32	0.62	1.32	2.09	3.08	5.29	9.43	9.43
Winter	698,000	56	1.43	2.17	0.20	0.14	0.40	0.50	0.86	2.02	2.95	4.26	5.40	6.00	6.00
Urbanization															
Central City	679,000	25	1.20	0.96	0.15	0.16	0.16	0.18	0.38	0.56	1.52	2.07	2.25	2.54	2.54
Non-metropolitan	3,046,000	159	6.77	1.96	0.16	0.18	0.27	0.37	0.77	1.50	2.38	3.55	5.64	12.80	12.80
Suburban	2,110,000	95	2.44	1.49	0.17	0.11	0.19	0.32	0.54	0.93	1.68	3.11	4.76	9.43	9.43
Race															
Black	140,000	5	0.64	*	*	*	*	*	*	*	*	*	*	*	*
White	5,550,000	269	3.52	1.67	0.11	0.14	0.21	0.31	0.55	1.28	2.09	3.11	4.76	9.52	12.80
Region															
Midwest	2,587,000	133	5.58	1.77	0.15	0.18	0.24	0.34	0.64	1.35	2.15	3.77	5.29	9.43	9.43
Northeast	656,000	31	1.59	1.28	0.20	0.07	0.13	0.17	0.35	0.86	1.97	2.95	3.80	5.09	5.09
South	1,796,000	84	2.79	2.08	0.24	0.16	0.35	0.46	0.92	1.56	2.40	3.44	5.64	12.80	12.80
West	796,000	31	2.21	0.76	0.11	0.16	0.22	0.26	0.41	0.54	0.96	1.40	1.95	3.11	3.11
Response to Questionnaire															
Households who garden	5,291,000	250	7.76	1.65	0.11	0.00	0.21	0.31	0.56	1.28	2.09	3.10	4.28	9.52	12.80
Households who farm	1,082,000	62	14.76	1.83	0.18	0.07	0.21	0.58	0.92	1.46	2.31	3.80	5.09	6.52	6.52

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-58. Consumer-Only Intake of Home-Produced Exposed Fruit (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	11,770,000	679	6.26	1.49	0.08	0.04	0.14	0.26	0.45	0.83	1.70	3.16	4.78	12.00	32.50
Age															
1 to 2	306,000	19	5.37	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	470,000	30	5.80	2.60	0.78	0.00	0.00	0.37	1.00	1.82	2.64	5.41	6.07	32.50	32.50
6 to 11	915,000	68	5.48	2.52	0.42	0.00	0.17	0.37	0.62	1.11	2.91	6.98	11.70	15.70	15.90
12 to 19	896,000	50	4.37	1.33	0.21	0.08	0.12	0.26	0.40	0.61	2.27	3.41	4.78	5.90	5.90
20 to 39	2,521,000	139	4.09	1.09	0.14	0.08	0.13	0.17	0.30	0.62	1.07	2.00	3.58	12.90	12.90
40 to 69	4,272,000	247	7.53	1.25	0.11	0.06	0.16	0.25	0.44	0.72	1.40	2.61	3.25	13.00	13.00
≥ 70	2,285,000	118	14.39	1.39	0.12	0.04	0.21	0.28	0.57	0.96	1.66	3.73	4.42	5.39	7.13
Season															
Fall	2,877,000	100	6.04	1.37	0.12	0.26	0.29	0.34	0.54	1.03	1.88	2.88	4.25	5.41	5.41
Spring	2,466,000	265	5.34	1.49	0.15	0.09	0.20	0.25	0.43	0.86	1.65	2.91	4.67	8.27	32.50
Summer	3,588,000	122	7.89	1.75	0.25	0.00	0.09	0.13	0.39	0.64	1.76	4.29	6.12	13.00	15.70
Winter	2,839,000	192	5.83	1.27	0.11	0.04	0.10	0.23	0.46	0.83	1.55	2.61	4.66	8.16	11.30
Urbanization															
Central City	2,552,000	99	4.53	1.34	0.20	0.04	0.10	0.26	0.45	0.86	1.60	2.37	2.88	13.00	13.00
Non-metropolitan	3,891,000	269	8.64	1.78	0.17	0.06	0.10	0.17	0.42	0.94	1.94	4.07	5.98	15.70	32.50
Suburban	5,267,000	309	6.08	1.36	0.09	0.09	0.21	0.29	0.47	0.77	1.65	3.16	4.67	7.29	12.90
Race															
Black	250,000	12	1.15	*	*	*	*	*	*	*	*	*	*	*	*
White	11,411,000	663	7.24	1.51	0.08	0.06	0.16	0.26	0.45	0.86	1.72	3.31	4.78	12.00	32.50
Region															
Midwest	4,429,000	293	9.55	1.60	0.14	0.04	0.13	0.22	0.42	0.88	1.88	3.58	4.78	12.00	32.50
Northeast	1,219,000	69	2.96	0.76	0.12	0.08	0.09	0.17	0.30	0.47	0.78	1.39	2.86	5.21	7.13
South	2,532,000	141	3.94	1.51	0.18	0.08	0.23	0.30	0.51	0.92	1.63	2.63	5.98	15.70	15.70
West	3,530,000	174	9.79	1.60	0.14	0.10	0.24	0.32	0.57	0.96	1.97	3.72	5.00	13.00	13.00
Response to Questionnaire															
Households who garden	10,197,000	596	14.96	1.55	0.09	0.04	0.16	0.26	0.45	0.88	1.73	3.41	5.00	12.90	32.50
Households who farm	1,917,000	112	26.16	2.32	0.25	0.07	0.28	0.37	0.68	1.30	3.14	5.00	6.12	15.70	15.70

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-59. Consumer-Only Intake of Home-Produced Protected Fruits (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	3,855,000	173	2.05	5.74	0.63	0.15	0.27	0.34	0.93	2.34	7.45	16.00	19.70	47.30	53.60
Age															
1 to 2	79,000	5	1.39	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	80,000	4	0.99	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	181,000	9	1.08	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	377,000	20	1.84	2.96	0.99	0.12	0.16	0.28	0.39	1.23	2.84	7.44	11.40	19.10	19.10
20 to 39	755,000	29	1.23	4.51	1.08	0.18	0.36	0.49	1.22	1.88	4.47	14.60	16.10	24.10	24.10
40 to 69	1,702,000	77	3.00	5.65	0.87	0.11	0.24	0.29	0.67	2.22	9.36	15.50	21.20	41.30	41.30
≥ 70	601,000	26	3.78	4.44	0.69	0.26	0.26	0.29	1.95	3.29	7.06	8.97	9.97	15.20	15.20
Season															
Fall	394,000	12	0.83	*	*	*	*	*	*	*	*	*	*	*	*
Spring	497,000	36	1.08	2.08	0.35	0.16	0.18	0.26	0.38	1.22	4.08	5.10	6.57	6.79	6.79
Summer	1,425,000	47	3.13	7.39	1.45	0.11	0.27	0.39	1.25	3.06	10.30	16.60	24.10	53.60	53.60
Winter	1,539,000	78	3.16	6.24	0.91	0.15	0.30	0.38	1.39	2.65	8.23	17.80	21.20	47.30	47.30
Urbanization															
Central City	1,312,000	50	2.33	3.94	0.58	0.15	0.26	0.33	0.83	3.01	5.01	9.23	9.97	18.80	18.80
Non-metropolitan	506,000	19	1.12	*	*	*	*	*	*	*	*	*	*	*	*
Suburban	2,037,000	104	2.35	6.83	0.94	0.11	0.25	0.29	0.59	2.01	10.30	17.90	23.80	53.60	53.60
Race															
Black	200,000	8	0.92	*	*	*	*	*	*	*	*	*	*	*	*
White	3,655,000	165	2.32	5.91	0.65	0.12	0.26	0.33	1.06	2.44	7.46	16.00	21.20	47.30	53.60
Region															
Midwest	657,000	24	1.42	10.70	2.60	0.25	0.26	0.29	1.18	7.44	14.60	24.10	41.30	53.60	53.60
Northeast	105,000	5	0.26	*	*	*	*	*	*	*	*	*	*	*	*
South	1,805,000	74	2.81	4.77	0.65	0.16	0.36	0.45	1.23	2.54	5.10	15.20	16.60	23.80	24.00
West	1,288,000	70	3.57	4.85	0.93	0.11	0.18	0.27	0.49	1.84	5.34	12.30	18.80	47.30	47.30
Response to Questionnaire															
Households who garden	3,360,000	146	4.93	5.90	0.70	0.12	0.27	0.34	1.16	2.42	7.46	16.00	19.10	47.30	53.60
Households who farm	357,000	14	4.87	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-60. Consumer-Only Intake of Home-Produced Exposed Vegetables (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	28,762,000	1,511	15.30	1.52	0.05	0.00	0.09	0.17	0.40	0.86	1.83	3.55	5.12	10.30	20.60
Age															
1 to 2	815,000	43	14.30	3.48	0.51	0.02	0.24	0.83	1.20	1.89	4.23	10.70	11.90	12.10	12.10
3 to 5	1,069,000	62	13.19	1.74	0.22	0.00	0.01	0.05	0.58	1.16	2.53	3.47	6.29	7.36	8.86
6 to 11	2,454,000	134	14.68	1.39	0.18	0.00	0.04	0.09	0.31	0.64	1.60	3.22	5.47	13.30	13.30
12 to 19	2,611,000	143	12.74	1.07	0.09	0.00	0.03	0.14	0.30	0.66	1.46	2.35	3.78	5.67	5.67
20 to 39	6,969,000	348	11.31	1.05	0.08	0.01	0.07	0.12	0.26	0.56	1.26	2.33	3.32	7.57	20.60
40 to 69	10,993,000	579	19.38	1.60	0.08	0.00	0.14	0.24	0.48	0.98	1.92	3.59	5.22	8.99	19.00
≥ 70	3,517,000	185	22.15	1.68	0.12	0.01	0.15	0.24	0.52	1.13	2.38	4.08	4.96	6.96	10.20
Season															
Fall	8,865,000	314	18.60	1.31	0.10	0.05	0.11	0.18	0.33	0.65	1.56	3.13	4.45	8.92	12.20
Spring	4,863,000	487	10.54	1.14	0.06	0.00	0.05	0.15	0.34	0.66	1.39	2.76	4.02	7.51	10.70
Summer	10,151,000	348	22.32	2.03	0.13	0.00	0.11	0.20	0.61	1.30	2.52	4.32	6.35	12.70	19.00
Winter	4,883,000	362	10.02	1.21	0.10	0.00	0.02	0.14	0.37	0.67	1.42	2.76	3.69	8.86	20.60
Urbanization															
Central City	4,859,000	173	8.62	1.11	0.10	0.01	0.06	0.08	0.28	0.70	1.43	2.49	3.29	8.34	12.10
Non-metropolitan	11,577,000	711	25.71	1.87	0.09	0.02	0.17	0.25	0.50	1.16	2.20	4.12	6.10	12.20	19.00
Suburban	12,266,000	625	14.17	1.35	0.07	0.00	0.10	0.16	0.36	0.74	1.58	3.22	5.22	8.61	20.60
Race															
Black	1,713,000	100	7.88	1.23	0.13	0.00	0.08	0.14	0.35	0.89	1.51	3.32	3.92	5.55	7.19
White	26,551,000	1,386	16.85	1.53	0.05	0.00	0.10	0.18	0.40	0.86	1.82	3.48	5.12	10.30	20.60
Region															
Midwest	10,402,000	570	22.42	1.48	0.09	0.01	0.07	0.16	0.39	0.81	1.69	3.55	4.67	11.90	20.60
Northeast	4,050,000	191	9.84	1.65	0.18	0.00	0.08	0.14	0.26	0.67	1.75	5.58	6.80	12.70	14.90
South	9,238,000	503	14.36	1.55	0.08	0.05	0.16	0.26	0.52	1.00	1.92	3.19	4.52	9.92	13.30
West	5,012,000	245	13.90	1.43	0.10	0.00	0.03	0.15	0.39	0.76	2.13	3.45	4.84	7.51	8.34
Response to Questionnaire															
Households who garden	25,737,000	1,361	37.76	1.57	0.06	0.00	0.09	0.17	0.41	0.89	1.97	3.63	5.45	10.30	20.60
Households who farm	3,596,000	207	49.07	2.17	0.16	0.00	0.18	0.37	0.65	1.38	2.81	6.01	6.83	10.30	13.30

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-61. Consumer-Only Intake of Home-Produced Protected Vegetables (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	11,428,000	656	6.08	1.01	0.05	0.10	0.15	0.19	0.32	0.63	1.20	2.24	3.05	6.49	9.42
Age															
1 to 2	348,000	21	6.11	2.46	0.49	0.32	0.32	0.54	1.36	1.94	2.96	3.88	9.42	9.42	9.42
3 to 5	440,000	32	5.43	1.30	0.21	0.23	0.23	0.32	0.48	1.04	1.48	2.51	5.10	5.31	5.31
6 to 11	1,052,000	63	6.30	1.10	0.13	0.19	0.21	0.32	0.39	0.79	1.31	2.14	3.12	5.40	5.40
12 to 19	910,000	51	4.44	0.78	0.09	0.06	0.16	0.24	0.35	0.58	0.82	1.85	2.20	2.69	2.69
20 to 39	3,227,000	164	5.24	0.76	0.06	0.11	0.15	0.17	0.24	0.51	0.97	1.73	2.51	3.63	4.76
40 to 69	3,818,000	226	6.73	0.93	0.07	0.07	0.14	0.17	0.32	0.60	1.11	1.87	3.04	6.84	7.44
≥ 70	1,442,000	89	9.08	1.05	0.16	0.12	0.21	0.24	0.36	0.57	1.21	1.86	3.05	9.23	9.23
Season															
Fall	3,907,000	143	8.20	0.85	0.07	0.12	0.16	0.20	0.32	0.57	1.10	1.73	2.51	4.78	5.31
Spring	2,086,000	236	4.52	0.70	0.04	0.06	0.14	0.17	0.27	0.49	0.91	1.44	1.86	3.74	5.73
Summer	3,559,000	118	7.82	1.40	0.16	0.10	0.18	0.23	0.38	0.78	1.69	3.05	5.40	9.23	9.42
Winter	1,876,000	159	3.85	0.93	0.08	0.12	0.14	0.18	0.31	0.60	1.20	2.32	3.06	4.76	6.39
Urbanization															
Central City	1,342,000	49	2.38	1.00	0.15	0.12	0.15	0.17	0.32	0.72	1.18	2.36	2.83	4.78	4.78
Non-metropolitan	5,934,000	391	13.18	1.07	0.06	0.11	0.17	0.21	0.35	0.65	1.30	2.51	3.55	6.84	9.42
Suburban	4,152,000	216	4.80	0.93	0.08	0.07	0.15	0.19	0.29	0.56	1.15	1.85	2.67	6.49	9.23
Race															
Black	479,000	27	2.20	1.50	0.23	0.16	0.26	0.33	0.87	0.94	2.20	3.05	3.23	4.95	4.95
White	10,836,000	625	6.88	0.99	0.05	0.10	0.15	0.19	0.32	0.61	1.20	2.17	3.04	6.49	9.42
Region															
Midwest	4,359,000	273	9.40	1.01	0.07	0.11	0.17	0.23	0.33	0.57	1.08	2.45	3.68	6.84	7.44
Northeast	807,000	48	1.96	0.70	0.09	0.06	0.15	0.17	0.27	0.51	0.99	1.71	2.33	2.77	2.77
South	4,449,000	253	6.92	1.08	0.07	0.13	0.17	0.21	0.38	0.71	1.38	2.32	3.05	5.40	9.42
West	1,813,000	82	5.03	0.96	0.16	0.07	0.12	0.15	0.21	0.48	1.01	1.86	3.12	9.23	9.23
Response to Questionnaire															
Households who garden	10,286,000	602	15.09	1.01	0.05	0.10	0.15	0.19	0.34	0.64	1.21	2.32	3.05	6.49	9.23
Households who farm	2,325,000	142	31.72	1.30	0.15	0.09	0.17	0.21	0.34	0.60	1.40	3.55	5.40	9.23	9.23

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-62. Consumer-Only Intake of Home-Produced Root Vegetables (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	13,750,000	743	7.31	1.16	0.06	0.00	0.04	0.11	0.25	0.67	1.47	2.81	3.71	9.52	12.80
Age															
1 to 2	371,000	22	6.51	2.52	0.61	0.17	0.17	0.22	0.36	0.92	3.67	7.25	10.40	10.40	10.40
3 to 5	390,000	23	4.81	1.28	0.32	0.00	0.00	0.12	0.23	0.46	1.68	4.26	4.73	4.73	4.73
6 to 11	1,106,000	67	6.62	1.32	0.21	0.00	0.01	0.04	0.23	0.52	1.63	3.83	5.59	7.47	7.47
12 to 19	1,465,000	76	7.15	0.94	0.12	0.01	0.01	0.07	0.27	0.57	1.37	2.26	3.32	5.13	5.13
20 to 39	3,252,000	164	5.28	0.87	0.07	0.01	0.05	0.10	0.20	0.56	1.24	2.11	3.08	4.64	6.03
40 to 69	4,903,000	276	8.64	1.13	0.10	0.00	0.03	0.12	0.25	0.68	1.27	2.74	3.56	9.52	12.80
≥ 70	2,096,000	107	13.20	1.22	0.10	0.02	0.03	0.17	0.38	0.85	1.71	2.86	3.21	4.01	4.77
Season															
Fall	4,026,000	153	8.45	1.42	0.15	0.05	0.14	0.17	0.31	0.92	1.67	3.26	3.85	12.30	12.80
Spring	2,552,000	260	5.53	0.69	0.06	0.00	0.02	0.03	0.14	0.37	0.77	1.69	2.80	4.24	7.69
Summer	5,011,000	169	11.02	1.19	0.12	0.00	0.05	0.13	0.28	0.73	1.51	2.74	3.64	10.40	11.90
Winter	2,161,000	161	4.44	1.17	0.12	0.00	0.01	0.04	0.24	0.56	1.56	3.08	4.14	6.21	11.30
Urbanization															
Central City	2,385,000	96	4.23	0.75	0.08	0.03	0.04	0.14	0.22	0.43	0.92	1.91	2.70	3.56	3.93
Non-metropolitan	6,094,000	366	13.54	1.43	0.10	0.01	0.07	0.13	0.28	0.76	1.85	3.32	4.24	11.30	12.80
Suburban	5,211,000	279	6.02	1.06	0.09	0.00	0.01	0.07	0.23	0.73	1.19	2.34	3.26	6.29	11.90
Race															
Black	521,000	31	2.40	0.88	0.39	0.00	0.01	0.04	0.09	0.54	0.77	1.06	1.25	12.30	12.30
White	12,861,000	697	8.16	1.18	0.06	0.01	0.05	0.13	0.26	0.68	1.50	2.82	3.72	9.52	12.80
Region															
Midwest	5,572,000	314	12.01	1.31	0.10	0.03	0.07	0.17	0.27	0.74	1.67	3.23	4.26	10.40	11.90
Northeast	1,721,000	92	4.18	0.84	0.10	0.00	0.01	0.01	0.14	0.48	1.18	2.05	2.77	4.78	6.03
South	3,842,000	205	5.97	1.38	0.14	0.01	0.05	0.13	0.28	0.69	1.70	3.32	3.83	12.30	12.80
West	2,555,000	130	7.08	0.77	0.06	0.00	0.02	0.11	0.24	0.57	0.98	1.69	2.45	3.72	3.72
Response to Questionnaire															
Households who garden	12,578,000	682	18.46	1.15	0.06	0.00	0.04	0.12	0.26	0.67	1.50	2.81	3.64	7.47	12.80
Households who farm	2,367,000	136	32.30	1.39	0.13	0.11	0.16	0.18	0.37	0.88	1.85	3.11	4.58	7.47	7.69

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-63. Consumer-Only Intake of Home-Produced Dark Green Vegetables (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	8,855,000	428	4.71	0.39	0.03	0.00	0.00	0.01	0.09	0.21	0.44	0.92	1.25	3.53	5.82
Age															
1 to 2	180,000	8	3.16	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	226,000	12	2.79	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	826,000	39	4.94	0.31	0.05	0.00	0.01	0.02	0.09	0.18	0.39	0.95	1.04	1.28	1.28
12 to 19	628,000	32	3.07	0.42	0.15	0.00	0.01	0.01	0.06	0.20	0.37	0.92	1.64	4.86	4.86
20 to 39	1,976,000	87	3.21	0.34	0.06	0.00	0.00	0.01	0.09	0.18	0.38	0.67	0.92	2.94	4.29
40 to 69	3,710,000	184	6.54	0.40	0.04	0.00	0.00	0.03	0.08	0.23	0.48	0.98	1.25	3.29	5.82
≥ 70	1,253,000	63	7.89	0.41	0.07	0.00	0.00	0.01	0.11	0.23	0.47	0.93	1.08	3.45	3.45
Season															
Fall	2,683,000	88	5.63	0.44	0.07	0.01	0.04	0.09	0.15	0.24	0.46	0.79	1.08	3.86	4.29
Spring	1,251,000	127	2.71	0.56	0.08	0.00	0.00	0.01	0.10	0.31	0.54	1.28	2.81	4.86	5.82
Summer	3,580,000	124	7.87	0.34	0.04	0.00	0.00	0.01	0.06	0.15	0.41	0.98	1.15	2.48	2.48
Winter	1,341,000	89	2.75	0.27	0.04	0.00	0.00	0.01	0.02	0.15	0.37	0.66	1.17	2.04	2.18
Urbanization															
Central City	1,298,000	48	2.30	0.27	0.04	0.00	0.00	0.01	0.11	0.21	0.32	0.63	0.92	1.07	1.07
Non-metropolitan	3,218,000	167	7.15	0.33	0.04	0.00	0.00	0.02	0.07	0.17	0.45	0.75	1.00	2.48	5.82
Suburban	4,279,000	211	4.94	0.48	0.05	0.00	0.01	0.02	0.09	0.23	0.46	1.15	2.18	3.86	4.86
Race															
Black	724,000	49	3.33	1.04	0.18	0.00	0.10	0.11	0.22	0.55	1.17	3.29	3.86	4.86	4.86
White	7,963,000	373	5.05	0.32	0.02	0.00	0.00	0.01	0.08	0.20	0.38	0.78	1.07	2.37	5.82
Region															
Midwest	2,668,000	121	5.75	0.28	0.04	0.00	0.00	0.01	0.06	0.21	0.36	0.50	0.98	2.48	3.02
Northeast	1,554,000	76	3.77	0.51	0.09	0.00	0.00	0.00	0.06	0.20	0.49	1.25	1.93	3.53	5.82
South	2,945,000	148	4.58	0.48	0.05	0.04	0.07	0.09	0.15	0.29	0.64	0.92	1.28	3.86	4.29
West	1,628,000	81	4.51	0.32	0.07	0.00	0.00	0.01	0.04	0.11	0.31	0.66	0.93	4.86	4.86
Response to Questionnaire															
Households who garden	8,521,000	412	12.50	0.40	0.03	0.00	0.00	0.01	0.09	0.21	0.45	0.92	1.25	3.53	5.82
Households who farm	1,450,000	66	19.78	0.38	0.06	0.00	0.00	0.01	0.07	0.23	0.48	0.95	1.25	2.48	3.02

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-64. Consumer-Only Intake of Home-Produced Deep Yellow Vegetables (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	5,467,000	245	2.91	0.64	0.04	0.04	0.07	0.13	0.22	0.42	0.77	1.44	2.03	2.67	6.63
Age															
1 to 2	124,000	8	2.18	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	61,000	4	0.75	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	382,000	17	2.29	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	493,000	21	2.41	0.47	0.09	0.06	0.06	0.06	0.09	0.36	0.78	1.13	1.44	1.58	1.58
20 to 39	1,475,000	63	2.39	0.53	0.08	0.05	0.06	0.12	0.17	0.31	0.51	1.22	2.03	2.67	2.67
40 to 69	2,074,000	96	3.66	0.54	0.05	0.04	0.09	0.14	0.22	0.40	0.65	1.09	1.33	3.02	3.02
≥ 70	761,000	32	4.79	0.78	0.09	0.08	0.20	0.28	0.37	0.57	1.24	1.61	1.99	1.99	1.99
Season															
Fall	2,664,000	97	5.59	0.74	0.08	0.09	0.12	0.14	0.26	0.45	0.97	1.73	2.23	3.02	6.63
Spring	315,000	34	0.68	0.56	0.08	0.14	0.15	0.20	0.25	0.45	0.64	1.01	1.42	2.41	2.41
Summer	1,619,000	52	3.56	0.51	0.06	0.04	0.05	0.06	0.23	0.41	0.64	0.96	1.67	2.31	2.31
Winter	869,000	62	1.78	0.63	0.09	0.04	0.04	0.06	0.17	0.35	0.80	1.54	2.23	4.37	4.37
Urbanization															
Central City	1,308,000	43	2.32	0.51	0.07	0.04	0.06	0.14	0.21	0.39	0.59	0.96	1.41	2.24	2.24
Non-metropolitan	2,100,000	118	4.66	0.67	0.08	0.04	0.06	0.09	0.22	0.37	0.87	1.39	2.12	4.37	6.63
Suburban	2,059,000	84	2.38	0.71	0.07	0.06	0.09	0.13	0.26	0.43	0.97	1.67	2.03	2.67	2.67
Race															
Black	129,000	8	0.59	*	*	*	*	*	*	*	*	*	*	*	*
White	5,093,000	229	3.23	0.65	0.04	0.05	0.09	0.14	0.24	0.43	0.80	1.50	2.03	2.67	4.37
Region															
Midwest	2,792,000	128	6.02	0.75	0.06	0.04	0.13	0.19	0.28	0.51	0.96	1.73	2.23	3.02	4.37
Northeast	735,000	29	1.79	0.40	0.08	0.04	0.06	0.06	0.09	0.15	0.64	1.09	1.37	2.21	2.21
South	557,000	30	0.87	0.54	0.21	0.05	0.05	0.08	0.22	0.31	0.44	0.77	1.22	6.63	6.63
West	1,383,000	58	3.83	0.60	0.07	0.06	0.13	0.14	0.22	0.41	0.64	1.44	1.89	2.31	2.31
Response to Questionnaire															
Households who garden	5,177,000	233	7.60	0.62	0.04	0.04	0.09	0.13	0.23	0.42	0.75	1.42	1.99	2.67	4.37
Households who farm	1,088,000	51	14.85	0.61	0.09	0.09	0.09	0.12	0.19	0.34	0.94	1.28	1.73	3.02	3.02

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-65. Consumer-Only Intake of Home-Produced Other Vegetables (g/kg-day)

Population Group	Nc Wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	25,221,000	1,437	13.41	1.38	0.05	0.01	0.11	0.18	0.36	0.78	1.65	3.09	4.52	9.95	18.40
Age															
1 to 2	613,000	38	10.76	3.80	0.63	0.19	0.27	0.40	1.04	2.61	4.55	7.74	11.20	18.00	18.00
3 to 5	887,000	59	10.95	2.15	0.27	0.00	0.23	0.37	0.72	1.37	3.16	4.47	5.96	8.41	14.00
6 to 11	2,149,000	134	12.86	1.30	0.14	0.00	0.12	0.19	0.35	0.80	1.61	3.04	4.57	9.95	9.95
12 to 19	2,379,000	141	11.61	0.98	0.09	0.00	0.06	0.12	0.32	0.64	1.33	2.05	3.17	5.41	5.41
20 to 39	6,020,000	328	9.77	0.93	0.06	0.03	0.09	0.15	0.24	0.56	1.12	2.19	3.04	5.10	7.00
40 to 69	9,649,000	547	17.01	1.40	0.09	0.01	0.11	0.19	0.40	0.84	1.58	2.92	4.65	14.10	18.40
≥ 70	3,226,000	174	20.31	1.58	0.14	0.02	0.15	0.24	0.46	0.95	1.91	3.46	5.79	9.96	11.40
Season															
Fall	6,934,000	253	14.55	1.19	0.09	0.05	0.15	0.19	0.33	0.72	1.44	2.74	4.00	6.74	9.96
Spring	5,407,000	567	11.71	1.16	0.06	0.00	0.04	0.10	0.31	0.71	1.39	2.67	4.21	7.35	14.00
Summer	8,454,000	283	18.59	1.79	0.15	0.00	0.12	0.18	0.39	0.97	1.97	4.13	6.14	14.60	18.40
Winter	4,426,000	334	9.09	1.19	0.07	0.00	0.14	0.23	0.41	0.73	1.49	2.41	3.37	7.00	11.00
Urbanization															
Central City	4,148,000	161	7.36	0.97	0.09	0.04	0.09	0.16	0.32	0.61	1.23	1.97	3.22	7.00	8.85
Non-metropolitan	10,721,000	710	23.81	1.78	0.09	0.03	0.16	0.23	0.47	1.01	2.01	4.05	5.74	14.10	18.40
Suburban	10,292,000	564	11.89	1.14	0.06	0.00	0.09	0.15	0.31	0.65	1.44	2.69	3.77	6.81	11.40
Race															
Black	1,347,000	84	6.19	1.30	0.17	0.04	0.17	0.21	0.35	0.71	1.49	3.88	5.47	6.21	7.72
White	23,367,000	1,327	14.83	1.39	0.05	0.01	0.11	0.18	0.38	0.79	1.65	3.04	4.49	9.96	18.40
Region															
Midwest	8,296,000	522	17.88	1.43	0.09	0.03	0.12	0.19	0.37	0.73	1.65	3.05	4.65	11.20	18.40
Northeast	2,914,000	162	7.08	1.33	0.17	0.00	0.06	0.11	0.24	0.60	1.64	3.07	5.41	12.00	14.10
South	9,218,000	518	14.33	1.53	0.08	0.01	0.17	0.25	0.49	1.03	1.76	3.37	4.70	8.33	18.00
West	4,733,000	233	13.12	1.08	0.10	0.01	0.07	0.12	0.26	0.57	1.21	2.41	3.73	8.02	11.40
Response to Questionnaire															
Households who garden	22,417,000	1,291	32.89	1.44	0.05	0.01	0.11	0.18	0.38	0.82	1.70	3.22	4.65	9.95	18.40
Households who farm	3,965,000	239	54.10	1.95	0.16	0.01	0.14	0.23	0.52	1.21	2.04	5.32	7.02	14.60	15.90

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-66. Consumer-Only Intake of Home-Produced Citrus (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	2,530,000	125	1.35	4.76	0.61	0.08	0.16	0.29	0.76	1.99	5.10	14.10	19.70	32.20	47.90
Age															
1 to 2	54,000	4	0.95	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	51,000	3	0.63	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	181,000	9	1.08	*	*	*	*	*	*	*	*	*	*	*	*
12 to 19	194,000	14	0.95	*	*	*	*	*	*	*	*	*	*	*	*
20 to 39	402,000	18	0.65	*	*	*	*	*	*	*	*	*	*	*	*
40 to 69	1,183,000	55	2.09	4.54	0.81	0.08	0.15	0.25	0.52	1.74	5.24	15.20	19.70	23.80	23.80
≥ 70	457,000	21	2.88	4.43	0.76	0.08	0.08	0.49	1.95	3.53	6.94	8.97	8.97	15.70	15.70
Season															
Fall	280,000	8	0.59	*	*	*	*	*	*	*	*	*	*	*	*
Spring	437,000	33	0.95	2.31	0.38	0.16	0.18	0.24	0.37	1.36	4.15	5.10	6.50	7.52	7.52
Summer	334,000	11	0.73	*	*	*	*	*	*	*	*	*	*	*	*
Winter	1,479,000	73	3.04	6.47	0.95	0.15	0.33	0.49	1.64	2.93	8.59	19.10	23.80	47.90	47.90
Urbanization															
Central City	1,053,000	43	1.87	3.57	0.52	0.15	0.33	0.45	1.13	3.01	4.97	7.46	8.97	20.00	20.00
Non-metropolitan	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Suburban	1,477,000	82	1.71	5.61	0.91	0.08	0.11	0.25	0.52	1.81	8.12	17.90	23.80	47.90	47.90
Race															
Black	200,000	8	0.92	*	*	*	*	*	*	*	*	*	*	*	*
White	2,330,000	117	1.48	4.93	0.63	0.08	0.15	0.28	0.78	2.34	5.34	14.10	19.70	32.20	47.90
Region															
Midwest	64,000	4	0.14	*	*	*	*	*	*	*	*	*	*	*	*
Northeast	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
South	1,240,000	55	1.93	5.18	0.74	0.16	0.38	0.64	1.60	3.42	6.50	14.10	19.70	23.80	23.80
West	1,226,000	66	3.40	4.56	0.98	0.08	0.11	0.24	0.37	1.42	4.53	12.40	20.00	47.90	47.90
Response to Questionnaire															
Households who garden	2,151,000	102	3.16	4.55	0.66	0.08	0.15	0.28	0.76	1.99	4.99	12.40	17.90	32.20	47.90
Households who farm	130,000	5	1.77	*	*	*	*	*	*	*	*	*	*	*	*

* Intake data not provided for subpopulations for which there were less than 20 observations.
\- Indicates data are not available.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-67. Consumer-Only Intake of Home-Produced Other Fruit (g/kg-day)

Population Group	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	*p*1	*p*5	*p*10	*p*25	*p*50	*p*75	*p*90	*p*95	*p*99	MAX
Total	12,615,000	706	6.71	2.20	0.19	0.05	0.15	0.26	0.46	0.91	1.91	4.59	8.12	18.40	62.60
Age															
1 to 2	306,000	19	5.37	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	499,000	31	6.16	2.66	0.76	0.00	0.00	0.38	1.02	1.87	2.71	5.54	6.30	33.20	33.20
6 to 11	915,000	68	5.48	2.60	0.44	0.00	0.18	0.39	0.64	1.14	2.99	7.13	12.10	16.20	16.50
12 to 19	1,021,000	54	4.98	1.62	0.28	0.08	0.12	0.26	0.39	0.61	2.36	3.92	6.81	8.12	8.12
20 to 39	2,761,000	146	4.48	1.85	0.37	0.08	0.13	0.18	0.31	0.62	1.39	3.70	6.64	37.00	37.00
40 to 69	4,610,000	259	8.13	2.09	0.31	0.07	0.15	0.25	0.44	0.77	1.77	3.17	9.77	18.40	53.30
≥ 70	2,326,000	119	14.65	1.66	0.18	0.04	0.21	0.36	0.57	1.07	1.65	4.06	5.21	11.70	11.70
Season															
Fall	2,923,000	102	6.13	1.39	0.11	0.26	0.30	0.38	0.57	1.07	1.88	2.89	4.06	5.39	5.54
Spring	2,526,000	268	5.47	1.47	0.15	0.09	0.20	0.25	0.43	0.83	1.65	2.89	4.59	8.26	33.20
Summer	4,327,000	144	9.51												
Winter	2,839,000	192	5.83	1.29	0.11	0.04	0.10	0.23	0.45	0.83	1.55	2.70	4.79	8.06	11.30
Urbanization															
Central City	2,681,000	102	4.76	1.79	0.29	0.04	0.17	0.29	0.52	0.89	1.60	2.61	10.40	15.40	15.40
Non-metropolitan	4,118,000	278	9.15	2.43	0.31	0.07	0.12	0.24	0.45	1.13	2.43	4.60	8.12	24.00	53.30
Suburban	5,756,000	324	6.65	2.25	0.31	0.13	0.20	0.28	0.45	0.76	1.81	4.72	7.61	18.40	62.60
Race															
Black	250,000	12	1.15	*	*	*	*	*	*	*	*	*	*	*	*
White	12,256,000	690	7.78	2.24	0.19	0.07	0.15	0.26	0.47	0.92	1.94	4.65	8.26	18.40	62.60
Region															
Midwest	4,619,000	298	9.96	3.07	0.43	0.04	0.13	0.24	0.45	1.04	2.35	6.73	14.20	53.30	62.60
Northeast	1,279,000	72	3.11	0.93	0.22	0.08	0.09	0.16	0.31	0.48	0.81	1.29	2.16	11.70	11.70
South	3,004,000	157	4.67	1.99	0.26	0.08	0.24	0.30	0.55	1.10	1.82	4.06	6.30	16.20	24.00
West	3,653,000	177	10.13	1.76	0.16	0.10	0.22	0.29	0.54	0.97	2.04	4.35	5.75	13.00	13.00
Response to Questionnaire															
Households who garden	10,926,000	619	16.03	2.38	0.21	0.04	0.16	0.26	0.47	0.99	1.96	4.94	10.40	18.40	62.60
Households who farm	1,917,000	112	26.16	2.57	0.27	0.07	0.28	0.36	0.73	1.55	3.62	5.80	8.06	16.20	16.20

* Intake data not provided for subpopulations for which there were less than 20 observations.

SE = Standard error.
p = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-68. Fraction of Food Intake That Is Home-Produced

	Total Fruits	Total Vegetables	Total Meats	Total Dairy	Total Fish	Exposed Vegetables	Protected Vegetables	Root Vegetables	Exposed Fruits	Protected Fruits
Total	0.040	0.068	0.024	0.012	0.094	0.095	0.069	0.043	0.050	0.037
Season										
Fall	0.021	0.081	0.020	0.008	0.076	0.106	0.073	0.060	0.039	0.008
Spring	0.021	0.037	0.020	0.011	0.160	0.050	0.039	0.020	0.047	0.008
Summer	0.058	0.116	0.034	0.022	0.079	0.164	0.101	0.066	0.068	0.054
Winter	0.059	0.041	0.022	0.008	0.063	0.052	0.048	0.026	0.044	0.068
Urbanization										
Central City	0.027	0.027	0.003	0.000	0.053	0.037	0.027	0.016	0.030	0.026
Non-metropolitan	0.052	0.144	0.064	0.043	0.219	0.207	0.134	0.088	0.100	0.025
Suburban	0.047	0.058	0.018	0.004	0.075	0.079	0.054	0.035	0.043	0.050
Race										
Black	0.007	0.027	0.001	0.000	0.063	0.037	0.029	0.012	0.008	0.007
White	0.049	0.081	0.031	0.014	0.110	0.109	0.081	0.050	0.059	0.045
Region										
Northeast	0.005	0.038	0.009	0.010	0.008	0.062	0.016	0.018	0.010	0.002
Midwest	0.059	0.112	0.046	0.024	0.133	0.148	0.109	0.077	0.078	0.048
South	0.042	0.069	0.017	0.006	0.126	0.091	0.077	0.042	0.040	0.044
West	0.062	0.057	0.023	0.007	0.108	0.079	0.060	0.029	0.075	0.054
Response to Questionnaire										
Households who garden	0.101	0.173	-	-	-	0.233	0.178	0.106	0.116	0.094
Households who raise animals	-	-	0.306	0.207	-	-	-	-	-	-
Households who farm	0.161	0.308	0.319	0.254	-	0.420	0.394	0.173	0.328	0.030
Households who fish	-	-	-	-	0.325	-	-	-	-	-

Table 13-68. Fraction of Food Intake That Is Home-Produced (continued)

	Dark Green Vegetables	Deep Yellow Vegetables	Other Vegetables	Citrus Fruits	Other Fruits	Apples	Peaches	Pears	Strawberries	Other Berries
Total	0.044	0.065	0.069	0.038	0.042	0.030	0.147	0.067	0.111	0.217
Season										
Fall	0.059	0.099	0.069	0.114	0.027	0.032	0.090	0.038	0.408	0.163
Spring	0.037	0.017	0.051	0.014	0.025	0.013	0.206	0.075	0.064	0.155
Summer	0.063	0.080	0.114	0.010	0.070	0.053	0.133	0.066	0.088	0.232
Winter	0.018	0.041	0.044	0.091	0.030	0.024	0.183	0.111	0.217	0.308
Urbanization										
Central City	0.012	0.038	0.026	0.035	0.022	0.017	0.087	0.038	0.107	0.228
Non-metropolitan	0.090	0.122	0.154	0.000	0.077	0.066	0.272	0.155	0.133	0.282
Suburban	0.054	0.058	0.053	0.056	0.042	0.024	0.121	0.068	0.101	0.175
Race										
Black	0.053	0.056	0.026	0.012	0.004	0.007	0.018	0.004	0.000	0.470
White	0.043	0.071	0.082	0.045	0.051	0.035	0.164	0.089	0.125	0.214
Region										
Northeast	0.039	0.019	0.034	0.000	0.008	0.004	0.027	0.002	0.085	0.205
Midwest	0.054	0.174	0.102	0.001	0.083	0.052	0.164	0.112	0.209	0.231
South	0.049	0.022	0.077	0.060	0.031	0.024	0.143	0.080	0.072	0.177
West	0.034	0.063	0.055	0.103	0.046	0.043	0.238	0.093	0.044	0.233
Response to Questionnaire										
Households who garden	0.120	0.140	0.180	0.087	0.107	0.070	0.316	0.169	0.232	0.306
Households who farm	0.220	0.328	0.368	0.005	0.227	0.292	0.461	0.606	0.057	0.548

Table 13-68. Fraction of Food Intake That Is Home-Produced (continued)

	Asparagus	Beets	Broccoli	Cabbage	Carrots	Corn	Cucumbers	Lettuce	Lima Beans	Okra	Onions
Total	0.063	0.203	0.015	0.038	0.043	0.078	0.148	0.010	0.121	0.270	0.056
Season											
Fall	0.024	0.199	0.013	0.054	0.066	0.076	0.055	0.013	0.070	0.299	0.066
Spring	0.103	0.191	0.011	0.011	0.015	0.048	0.040	0.010	0.082	0.211	0.033
Summer	0	0.209	0.034	0.080	0.063	0.118	0.320	0.017	0.176	0.304	0.091
Winter	0.019	0.215	0.006	0.008	0.025	0.043	0	0.002	0.129	0.123	0.029
Urbanization											
Central City	0.058	0.212	0.004	0.004	0.018	0.025	0.029	0.009	0.037	0.068	0.017
Non-metropolitan	0.145	0.377	0.040	0.082	0.091	0.173	0.377	0.017	0.132	0.411	0.127
Suburban	0.040	0.127	0.016	0.045	0.039	0.047	0.088	0.009	0.165	0.299	0.050
Race											
Black	0.000	0.000	0.000	0.001	0.068	0.019	0.060	0.007	0.103	0.069	0.009
White	0.071	0.224	0.018	0.056	0.042	0.093	0.155	0.011	0.135	0.373	0.068
Region											
Northeast	0.091	0.074	0.020	0.047	0.025	0.020	0.147	0.009	0.026	0.000	0.022
Midwest	0.194	0.432	0.025	0.053	0.101	0.124	0.193	0.020	0.149	0.224	0.098
South	0.015	0.145	0.013	0.029	0.020	0.088	0.140	0.006	0.140	0.291	0.047
West	0.015	0.202	0.006	0.029	0.039	0.069	0.119	0.009	0.000	0.333	0.083
Response to Questionnaire											
Households who garden	0.125	0.420	0.043	0.099	0.103	0.220	0.349	0.031	0.258	0.618	0.148
Households who farm	0.432	0.316	0.159	0.219	0.185	0.524	0.524	0.063	0.103	0.821	0.361

Table 13-68. Fraction of Food Intake That Is Home-Produced (continued)

	Peas	Peppers	Pumpkin	Snap Beans	Tomatoes	White Potatoes	Beef	Game	Pork	Poultry	Eggs
Total	0.069	0.107	0.155	0.155	0.184	0.038	0.038	0.276	0.013	0.011	0.014
Season											
Fall	0.046	0.138	0.161	0.199	0.215	0.058	0.028	0.336	0.012	0.011	0.009
Spring	0.048	0.031	0.046	0.152	0.045	0.010	0.027	0.265	0.015	0.012	0.022
Summer	0.126	0.194	0.19	0.123	0.318	0.060	0.072	0.100	0.010	0.007	0.013
Winter	0.065	0.03	0.154	0.147	0.103	0.022	0.022	0.330	0.014	0.014	0.011
Urbanization											
Central City	0.033	0.067	0.130	0.066	0.100	0.009	0.001	0.146	0.001	0.002	0.002
Non-metropolitan	0.123	0.228	0.250	0.307	0.313	0.080	0.107	0.323	0.040	0.026	0.029
Suburban	0.064	0.086	0.127	0.118	0.156	0.029	0.026	0.316	0.006	0.011	0.014
Race											
Black	0.047	0.039	0.022	0.046	0.060	0.007	0.000	0.000	0.000	0.001	0.002
White	0.076	0.121	0.187	0.186	0.202	0.044	0.048	0.359	0.017	0.014	0.017
Region											
Northeast	0.021	0.067	0.002	0.052	0.117	0.016	0.014	0.202	0.006	0.002	0.004
Midwest	0.058	0.188	0.357	0.243	0.291	0.065	0.076	0.513	0.021	0.021	0.019
South	0.106	0.113	0.044	0.161	0.149	0.042	0.022	0.199	0.012	0.012	0.012
West	0.051	0.082	0.181	0.108	0.182	0.013	0.041	0.207	0.011	0.008	0.021
Response to Questionnaire											
Households who garden	0.193	0.246	0.230	0.384	0.398	0.090	-	-	-	-	-
Households who farm	0.308	0.564	0.824	0.623	0.616	0.134	0.485	-	0.242	0.156	0.146
Households who raise animals	-	-	-	-	-	-	0.478	-	0.239	0.151	0.214
Households who hunt	-	-	-	-	-	-	-	0.729	-	-	-

- Indicates data are not available.

Source: Based on EPA's analyses of the 1987–1988 NFCS.

Table 13-69. Percent Weight Losses From Food Preparation

Food Group	Mean Net Preparation/Cooking Loss (%)	Mean Net Post Cooking (%)
Meats[a]	29.7[b]	29.7[c]
Fish and shellfish[d]	31.5[b]	10.5[c]
Fruits	25.4[e]	30.5[f]
Vegetables[g]	12.4[h]	22[i]

[a] Averaged over various cuts and preparation methods for various meats including beef, pork, chicken, turkey, lamb, and veal.

[b] Includes dripping and volatile losses during cooking.

[c] Includes losses from cutting, shrinkage, excess fat, bones, scraps, and juices.

[d] Averaged over a variety of fish and shellfish to include bass, bluefish, butterfish, cod, flounder, haddock, halibut, lake trout, mackerel, perch, porgy, red snapper, rockfish, salmon, sea trout, shad, smelt, sole, spot, squid, swordfish steak, trout, whitefish, clams, crab, crayfish, lobster, oysters, and shrimp and shrimp dishes.

[e] Based on preparation losses. Averaged over apples, pears, peaches, strawberries, and oranges. Includes losses from removal of skin or peel, core or pit, stems or caps, seeds, and defects. Also includes losses from removal of drained liquids from canned or frozen forms.

[f] Averaged over apples and peaches. Include losses from draining cooked forms.

[g] Averaged over various vegetables to include asparagus, beets, broccoli, cabbage, carrots, corn, cucumbers, lettuce, lima beans, okra, onions, green peas, peppers, pumpkins, snap beans, tomatoes, and potatoes.

[h] Includes losses due to paring, trimming, flowering the stalk, thawing, draining, scraping, shelling, slicing, husking, chopping, and dicing and gains from the addition of water, fat, or other ingredients. Averaged over various preparation methods.

[i] Includes losses from draining or removal of skin. Based on potatoes only.

Source: Derived from USDA (1975)

Table 13-70. Estimated Age-Specific Per Capita Home-Produced Intake (adjusted; g/kg-day)[a]

	Home-Produced Fruits				Home-Produced Vegetables				Home-Produced Meats				Home-Produced Dairy			
	Gardening Population		Farming Population		Gardening Population		Farming Population		Population that Raises Animals		Farming Population		Population that Raises Animals		Farming Population	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
	Unadjusted (g/kg-day)[b]															
Total population	0.52	2.4	0.67	4.5	0.96	5.1	1.9	9.8	1.5	6.1	1.5	6.3	1.9	14	2.4	17
	Adjusted (g/kg-day)[c]															
Total population	0.27	1.2	0.35	2.4	0.66	3.5	1.3	6.7	0.71	3.0	0.73	3.1	1.9	14	2.4	17
Birth to 1 year[d]	1.0	4.4	1.2	8.4	0.87	4.7	1.8	8.9	0.41	1.7	0.42	1.8	3.6	26	4.5	32
1 to <2 years	1.0	4.8	1.4	9.1	1.3	7.1	2.7	14	1.4	5.8	1.4	6.0	11	76	13	92
2 to <3 years	1.0	4.8	1.4	9.1	1.3	7.1	2.7	14	1.4	5.8	1.4	6.0	11	76	13	92
3 to <6 years	0.78	3.6	1.0	6.8	1.1	6.1	2.3	12	1.4	5.8	1.4	6.0	6.7	48	8.3	58
6 to <11 years	0.40	1.9	0.52	3.5	0.80	4.2	1.6	8.1	1.0	4.1	1.0	4.2	3.9	28	4.8	34
11 to <16 years	0.13	0.62	0.17	1.2	0.56	3.0	1.1	5.7	0.71	3.0	0.73	3.1	1.6	12	2.0	14
16 to <21 years	0.13	0.62	0.17	1.2	0.56	3.0	1.1	5.7	0.71	3.0	0.73	3.1	1.6	12	2.0	14
21 to <50 years	0.15	0.70	0.20	1.3	0.56	3.0	1.1	5.7	0.65	2.7	0.66	2.8	0.95	6.9	1.2	8.3
50+ years	0.24	1.1	0.31	2.1	0.60	3.2	1.2	6.1	0.51	2.1	0.52	2.2	0.92	6.7	1.1	8.0

[a] Calculated as: per capita home-produced intake for total population of households that garden, farm, or raise animals (See Section 13.3.1), times age-specific ratio of mean per capita total intake to mean per capita total intake for total population, based on analysis of 1994–96 and 1998 CSFII data (See Chapters 9 and 11).

[b] Not adjusted for food preparation or post-cooking losses.

[c] Adjusted to account for food preparation and post-cooking losses; no adjustments made to dairy.

[d] Estimates are uncertain for this age group because of the wide range of intake patterns for children under 1 year of age.

Source: Phillips and Moya (2012).

Table 13-71. 2008 Food Gardening by Demographic Factors

Demographic Factor	Percentage of Total Households That Have Gardens (%)
Total (~36 million)	31
Sex	
Female	54
Male	46
Age	
18–34	21
35–44	11
45–54	24
55 and over	44
Education	
College graduate	43
Some college	36
High school	21
Household income	
$75,000 and over	22
$50–$74,999	16
$35–$49,999	24
Under $35,000	21
Undesignated	17
Household size	
One person	20
Two person	40
Three to four person	32
Five or more persons	9

Source: National Gardening Association (2009).

Table 13-72. Percentage of Gardening Households Growing Different Vegetables in 2008

Vegetable	Percent (%)
Tomatoes	86
Cucumbers	47
Sweet peppers	46
Beans	39
Carrots	34
Summer squash	32
Onions	32
Hot peppers	31
Lettuce	28
Peas	24
Sweet Corn	23
Radish	20
Potatoes	18
Salad greens	17
Pumpkins	17
Watermelon	16
Spinach	15
Broccoli	15
Melon	15
Cabbage	14
Beets	11
Winter squash	10
Asparagus	9
Collards	9
Cauliflower	7
Celery	5
Brussels sprouts	5
Leeks	3
Kale	3
Parsnips	2
Chinese cabbage	2
Rutabaga	1

Source: National Gardening Association (2009).

APPENDIX 13A

FOOD CODES AND DEFINITIONS OF MAJOR FOOD GROUPS USED IN THE ANALYSIS OF THE 1987–1988 USDA NFCS DATA TO ESTIMATE HOME-PRODUCED INTAKE RATES

Table 13A-1. Food Codes and Definitions of Major Food Groups Used in Analysis of the 1987–1988 USDA NFCS Data to Estimate Intake of Home-Produced Foods

Food Product	Household Code/Definition[a]	Individual Code
	MAJOR FOOD GROUPS	
Total Fruits	50- Fresh Fruits citrus other vitamin-C rich other fruits 512- Commercially Canned Fruits 522- Commercially Frozen Fruits 533- Canned Fruit Juice 534- Frozen Fruit Juice 535- Aseptically Packed Fruit Juice 536- Fresh Fruit Juice 542- Dried Fruits (includes baby foods)	6- Fruits citrus fruits and juices dried fruits other fruits fruits/juices & nectar fruit/juices baby food (includes baby foods)
Total Vegetables	48- Potatoes, Sweet Potatoes 49- Fresh Vegetables dark green deep yellow tomatoes light green other 511- Commercially Canned Vegetables 521- Commercially Frozen Vegetables 531- Canned Vegetable Juice 532- Frozen Vegetable Juice 537- Fresh Vegetable Juice 538- Aseptically Packed Vegetable Juice 541- Dried Vegetables (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures/dinners)	7- Vegetables (all forms) white potatoes & Puerto Rican starchy dark green vegetables deep yellow vegetables tomatoes and tom. mixtures other vegetables veg. and mixtures/baby food veg. with meat mixtures (includes baby foods; mixtures, mostly vegetables)
Total Meats	44- Meat beef pork veal lamb mutton goat game lunch meat mixtures 451- Poultry (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	20- Meat, type not specified 21- Beef 22- Pork 23- Lamb, veal, game, carcass meat 24- Poultry 25- Organ meats, sausages, lunchmeats, meat spreads (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry and fish base; and gelatin-based drinks; includes baby foods)
Total Dairy	40- Milk Equivalent fresh fluid milk processed milk cream and cream substitutes frozen desserts with milk cheese dairy-based dips (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	1- Milk and Milk Products milk and milk drinks cream and cream substitutes milk desserts, sauces, and gravies cheeses (includes regular fluid milk, human milk, imitation milk products, yogurt, milk-based meal replacements, and infant formulas)
Total Fish	452- Fish, Shellfish various species fresh, frozen, commercial, dried (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	26- Fish, Shellfish various species and forms (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry and fish base; and gelatin-based drinks)

[a] Food items within these categories that were identified by the household as being home-produced or home-caught (i.e., source code pertaining to home-produced foods) were included in the analysis.

APPENDIX 13B

1987−1988 NFCS FOOD CODES AND DEFINITIONS OF INDIVIDUAL FOOD ITEMS USED IN ESTIMATING THE FRACTION OF HOUSEHOLD FOOD INTAKE THAT IS HOME-PRODUCED

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced

Food Product	Household Code/Definition	Individual Code
	INDIVIDUAL FOODS	
White Potatoes	4811- White Potatoes, fresh 4821- White Potatoes, commercially canned 4831- White Potatoes, commercially frozen 4841- White Potatoes, dehydrated 4851- White Potatoes, chips, sticks, salad (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	71- White Potatoes and Puerto Rican Starchy Veg. baked, boiled, chips, sticks, creamed, scalloped, au gratin, fried, mashed, stuffed, puffs, salad, recipes, soups, Puerto Rican starchy vegetables (does not include vegetables soups; vegetable mixtures; or vegetable with meat mixtures)
Peppers	4913- Green/Red Peppers, fresh 5111201 Sweet Green Peppers, commercially canned 5111202 Hot Chili Peppers, commercially canned 5211301 Sweet Green Peppers, commercially frozen 5211302 Green Chili Peppers, commercially frozen 5211303 Red Chili Peppers, commercially frozen 5413112 Sweet Green Peppers, dry 5413113 Red Chili Peppers, dry (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	7512100 Pepper, hot chili, raw 7512200 Pepper, raw 7512210 Pepper, sweet green, raw 7512220 Pepper, sweet red, raw 7522600 Pepper, green, cooked, NS as to fat added 7522601 Pepper, green, cooked, fat not added 7522602 Pepper, green, cooked, fat added 7522604 Pepper, red, cooked, NS as to fat added 7522605 Pepper, red, cooked, fat not added 7522606 Pepper, red, cooked, fat added 7522609 Pepper, hot, cooked, NS as to fat added 7522610 Pepper, hot, cooked, fat not added 7522611 Pepper, hot, cooked, fat added 7551101 Peppers, hot, sauce 7551102 Peppers, pickled (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Onions	4953- Onions, Garlic, fresh onions chives garlic leeks 5114908 Garlic Pulp, raw 5114915 Onions, commercially canned 5213722 Onions, commercially frozen 5213723 Onions with Sauce, commercially frozen 5413103 Chives, dried 5413105 Garlic Flakes, dried 5413110 Onion Flakes, dried (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	7510950 Chives, raw 7511150 Garlic, raw 7511250 Leek, raw 7511701 Onions, young green, raw 7511702 Onions, mature 7521550 Chives, dried 7521740 Garlic, cooked 7522100 Onions, mature cooked, NS as to fat added 7522101 Onions, mature cooked, fat not added 7522102 Onions, mature cooked, fat added 7522103 Onions, pearl cooked 7522104 Onions, young green cooked, NS as to fat 7522105 Onions, young green cooked, fat not added 7522106 Onions, young green cooked, fat added 7522110 Onion, dehydrated 7541501 Onions, creamed 7541502 Onion rings (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Corn	4956- Corn, fresh 5114601 Yellow Corn, commercially canned 5114602 White Corn, commercially canned 5114603 Yellow Creamed Corn, commercially canned 5114604 White Creamed Corn, commercially canned 5114605 Corn on Cob, commercially canned 5114607 Hominy, canned 5115306 Low Sodium Corn, commercially canned 5115307 Low Sodium Cr. Corn, commercially canned 5213501 Yellow Corn on Cob, commercially frozen 5213502 Yellow Corn off Cob, commercially frozen 5213503 Yell. Corn with Sauce, commercially frozen 5213504 Corn with other Veg., commercially frozen 5213505 White Corn on Cob, commercially frozen 5213506 White Corn off Cob, commercially frozen 5213507 Wh. Corn with Sauce, commercially frozen 5413104 Corn, dried 5413106 Hominy, dry 5413603 Corn, instant baby food (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby food)	7510960 Corn, raw 7521600 Corn, cooked, NS as to color/fat added 7521601 Corn, cooked, NS as to color/fat not added 7521602 Corn, cooked, NS as to color/fat added 7521605 Corn, cooked, NS as to color/cream style 7521607 Corn, cooked, dried 7521610 Corn, cooked, yellow/NS as to fat added 7521611 Corn, cooked, yellow/fat not added 7521612 Corn, cooked, yellow/fat added 7521615 Corn, yellow, cream style 7521616 Corn, cooked, yell. & wh./NS as to fat 7521617 Corn, cooked, yell. & wh./fat not added 7521618 Corn, cooked, yell. & wh./fat added 7521619 Corn, yellow, cream style, fat added 7521620 Corn, cooked, white/NS as to fat added 7521621 Corn, cooked, white/fat not added 7521622 Corn, cooked, white/fat added 7521625 Corn, white, cream style 7521630 Corn, yellow, canned, low sodium, NS fat 7521631 Corn, yell., canned, low sod., fat not add 7521632 Corn, yell., canned, low sod., fat added 7521749 Hominy, cooked 752175- Hominy, cooked 7541101 Corn scalloped or pudding 7541102 Corn fritter 7541103 Corn with cream sauce 7550101 Corn relish 76405- Corn, baby (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures; includes baby food)
Apples	5031- Apples, fresh 5122101 Applesauce with sugar, commercially canned 5122102 Applesauce without sugar, comm. canned 5122103 Apple Pie Filling, commercially canned 5122104 Apples, Applesauce, baby/jr., comm. canned 5122106 Apple Pie Filling, Low Cal., comm. canned 5223101 Apple Slices, commercially frozen 5332101 Apple Juice, canned 5332102 Apple Juice, baby, Comm. canned 5342201 Apple Juice, comm. frozen 5342202 Apple Juice, home frozen 5352101 Apple Juice, aseptically packed 5362101 Apple Juice, fresh 5423101 Apples, dried (includes baby food; except mixtures)	6210110 Apples, dried, uncooked 6210115 Apples, dried, uncooked, low sodium 6210120 Apples, dried, cooked, NS as to sweetener 6210122 Apples, dried, cooked, unsweetened 6210123 Apples, dried, cooked, with sugar 6310100 Apples, raw 6310111 Applesauce, NS as to sweetener 6310112 Applesauce, unsweetened 6310113 Applesauce with sugar 6310114 Applesauce with low calorie sweetener 6310121 Apples, cooked or canned with syrup 6310131 Apple, baked NS as to sweetener 6310132 Apple, baked, unsweetened 6310133 Apple, baked with sugar 6310141 Apple rings, fried 6310142 Apple, pickled 6310150 Apple, fried 6340101 Apple, salad 6340106 Apple, candied 6410101 Apple cider 6410401 Apple juice 6410405 Apple juice with vitamin C 6710200 Applesauce baby fd., NS as to str. or jr. 6710201 Applesauce baby food, strained 6710202 Applesauce baby food, junior 6720200 Apple juice, baby food (includes baby food; except mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Tomatoes	4931- Tomatoes, fresh 5113- Tomatoes, commercially canned 5115201 Tomatoes, low sodium, commercially canned 5115202 Tomato Sauce, low sodium, comm. canned 5115203 Tomato Paste, low sodium, comm. canned 5115204 Tomato Puree, low sodium, comm. canned 5311- Canned Tomato Juice and Tomato Mixtures 5321- Frozen Tomato Juice 5371- Fresh Tomato Juice 5381102 Tomato Juice, aseptically packed 5413115 Tomatoes, dry 5614- Tomato Soup 5624- Condensed Tomato Soup 5654- Dry Tomato Soup (does not include mixtures, and ready-to-eat dinners)	74- Tomatoes and Tomato Mixtures raw, cooked, juices, sauces, mixtures, soups, sandwiches
Snap Beans	4943- Snap or Wax Beans, fresh 5114401 Green or Snap Beans, commercially canned 5114402 Wax or Yellow Beans, commercially canned 5114403 Beans, baby/jr., commercially canned 5115302 Green Beans, low sodium, comm. canned 5115303 Yell. or Wax Beans, low sod., comm. canned 5213301 Snap or Green Beans, comm. frozen 5213302 Snap or Green w/sauce, comm. frozen 5213303 Snap or Green Beans w/other veg., comm. fr. 5213304 Sp. or Gr. Beans w/other veg./sc., comm. fr. 5213305 Wax or Yell. Beans, comm. frozen (does not include soups, mixtures, and ready-to-eat dinners; includes baby foods)	7510180 Beans, string, green, raw 7520498 Beans, string, cooked, NS color/fat added 7520499 Beans, string, cooked, NS color/no fat 7520500 Beans, string, cooked, NS color & fat 7520501 Beans, string, cooked, green/NS fat 7520502 Beans, string, cooked, green/no fat 7520503 Beans, string, cooked, green/fat 7520511 Beans, str., canned, low sod., green/NS fat 7520512 Beans, str., canned, low sod., green/no fat 7520513 Beans, str., canned, low sod., green/fat 7520600 Beans, string, cooked, yellow/NS fat 7520601 Beans, string, cooked, yellow/no fat 7520602 Beans, string, cooked, yellow/fat 7540301 Beans, string, green, creamed 7540302 Beans, string, green, w/mushroom sauce 7540401 Beans, string, yellow, creamed 7550011 Beans, string, green, pickled 7640100 Beans, green, string, baby 7640101 Beans, green, string, baby, str. 7640102 Beans, green, string, baby, junior 7640103 Beans, green, string, baby, creamed (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures; includes baby foods)
Beef	441- Beef (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	21- Beef beef, nfs beef steak beef oxtails, neck bones, ribs roasts, stew meat, corned, brisket, sandwich steaks ground beef, patties, meatballs other beef items beef baby food (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry, and fish base; and gelatin-based drinks; includes baby food)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Pork	442- Pork (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	22- Pork pork, nfs; ground dehydrated chops steaks, cutlets ham roasts Canadian bacon bacon, salt pork other pork items pork baby food (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry and fish base; and gelatin-based drinks; includes baby food)
Game	445- Variety Meat, Game (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	233- Game (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry, and fish base; and gelatin-based drinks)
Poultry	451- Poultry (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	24- Poultry chicken turkey duck other poultry poultry baby food (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry, and fish base; and gelatin-based drinks; includes baby food)
Eggs	46- Eggs (fresh equivalent) fresh processed eggs, substitutes (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	3- Eggs eggs egg mixtures egg substitutes eggs baby food froz. meals with egg as main ingred. (includes baby foods)
Broccoli	4912- Fresh Broccoli (and home canned/froz.) 5111203 Broccoli, comm. canned 52112- Comm. Frozen Broccoli (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	722- Broccoli (all forms) (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Carrots	4921- Fresh Carrots (and home canned/froz.) 51121- Comm. Canned Carrots 5115101 Carrots, Low Sodium, Comm. Canned 52121- Comm. Frozen Carrots 5312103 Comm. Canned Carrot Juice 5372102 Carrot Juice Fresh 5413502 Carrots, Dried Baby Food (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7310- Carrots (all forms) 7311140 Carrots in Sauce 7311200 Carrot Chips 76201- Carrots, baby (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures; includes baby foods except mixtures)
Pumpkin	4922- Fresh Pumpkin, Winter Squash (and home canned/froz.) 51122- Pumpkin/Squash, Baby or Junior, Comm. Canned 52122- Winter Squash, Comm. Frozen 5413504 Squash, Dried Baby Food (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	732- Pumpkin (all forms) 733- Winter squash (all forms) 76205- Squash, baby (does not include vegetable soups; vegetables mixtures; or vegetable with meat mixtures; includes baby foods)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Asparagus	4941- Fresh Asparagus (and home canned/froz.) 5114101 Comm. Canned Asparagus 5115301 Asparagus, Low Sodium, Comm. Canned 52131- Comm. Frozen Asparagus (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7510080 Asparagus, raw 75202- Asparagus, cooked 7540101 Asparagus, creamed or with cheese (does not include vegetable soups; vegetables mixtures, or vegetable with meat mixtures)
Lima Beans	4942- Fresh Lima and Fava Beans (and home canned/froz.) 5114204 Comm. Canned Mature Lima Beans 5114301 Comm. Canned Green Lima Beans 5115304 Comm. Canned Low Sodium Lima Beans 52132- Comm. Frozen Lima Beans 54111- Dried Lima Beans 5411306 Dried Fava Beans (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures; does not include succotash)	7510200 Lima Beans, raw 752040- Lima Beans, cooked 752041- Lima Beans, canned 75402- Lima Beans with sauce (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures; does not include succotash)
Cabbage	4944- Fresh Cabbage (and home canned/froz.) 4958601 Sauerkraut, home canned or pkgd 5114801 Sauerkraut, comm. canned 5114904 Comm. Canned Cabbage 5114905 Comm. Canned Cabbage (no sauce; incl. baby) 5115501 Sauerkraut, low sodium., comm. canned 5312102 Sauerkraut Juice, comm. canned (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7510300 Cabbage, raw 7510400 Cabbage, Chinese, raw 7510500 Cabbage, red, raw 7514100 Cabbage salad or coleslaw 7514130 Cabbage, Chinese, salad 75210- Chinese Cabbage, cooked 75211- Green Cabbage, cooked 75212- Red Cabbage, cooked 752130- Savoy Cabbage, cooked 75230- Sauerkraut, cooked 7540701 Cabbage, creamed 755025- Cabbage, pickled or in relish (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Lettuce	4945- Fresh Lettuce, French Endive (and home canned/froz.) (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	75113- Lettuce, raw 75143- Lettuce salad with other veg. 7514410 Lettuce, wilted, with bacon dressing 7522005 Lettuce, cooked (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Okra	4946- Fresh Okra (and home canned/froz.) 5114914 Comm. Canned Okra 5213720 Comm. Frozen Okra 5213721 Comm. Frozen Okra with Oth. Veg. & Sauce (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7522000 Okra, cooked, NS as to fat 7522001 Okra, cooked, fat not added 7522002 Okra, cooked, fat added 7522010 Lufta, cooked (Chinese Okra) 7541450 Okra, fried 7550700 Okra, pickled (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Peas	4947- Fresh Peas (and home canned/froz.) 51147- Comm Canned Peas (incl. baby) 5115310 Low Sodium Green or English Peas (canned) 5115314 Low Sod. Blackeyed, Gr. or Imm. Peas (canned) 5114205 Blackeyed Peas, comm. canned 52134- Comm. Frozen Peas 5412- Dried Peas and Lentils (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7512000 Peas, green, raw 7512775 Snowpeas, raw 75223- Peas, cowpeas, field or blackeyed, cooked 75224- Peas, green, cooked 75225- Peas, pigeon, cooked 75231- Snowpeas, cooked 7541650 Pea salad 7541660 Pea salad with cheese 75417- Peas, with sauce or creamed 76409- Peas, baby 76411- Peas, creamed, baby (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures; includes baby foods except mixtures)
Cucumbers	4952- Fresh Cucumbers (and home canned/froz.) (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7511100 Cucumbers, raw 75142- Cucumber salads 752167- Cucumbers, cooked 7550301 Cucumber pickles, dill 7550302 Cucumber pickles, relish 7550303 Cucumber pickles, sour 7550304 Cucumber pickles, sweet 7550305 Cucumber pickles, fresh 7550307 Cucumber, Kim Chee 7550311 Cucumber pickles, dill, reduced salt 7550314 Cucumber pickles, sweet, reduced salt (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Beets	4954- Fresh Beets (and home canned/froz.) 51145- Comm. Canned Beets (incl. baby) 5115305 Low Sodium Beets (canned) 5213714 Comm. Frozen Beets 5312104 Beet Juice (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	7510250 Beets, raw 752080- Beets, cooked 752081- Beets, canned 7540501 Beets, harvard 7550021 Beets, pickled 76403- Beets, baby (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures; includes baby foods except mixtures)
Strawberries	5022- Fresh Strawberries 5122801 Comm. Canned Strawberries with sugar 5122802 Comm. Canned Strawberries without sugar 5122803 Canned Strawberry Pie Filling 5222- Comm. Frozen Strawberries (does not include ready-to-eat dinners; includes baby foods except mixtures)	6322- Strawberries 6413250 Strawberry Juice (includes baby food; except mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Other Berries	5033- Fresh Berries Other than Strawberries 5122804 Comm. Canned Blackberries with sugar 5122805 Comm. Canned Blackberries without sugar 5122806 Comm. Canned Blueberries with sugar 5122807 Comm. Canned Blueberries without sugar 5122808 Canned Blueberry Pie Filling 5122809 Comm. Canned Gooseberries with sugar 5122810 Comm. Canned Gooseberries without sugar 5122811 Comm. Canned Raspberries with sugar 5122812 Comm. Canned Raspberries without sugar 5122813 Comm. Canned Cranberry Sauce 5122815 Comm. Canned Cranberry-Orange Relish 52233- Comm. Frozen Berries (not strawberries) 5332404 Blackberry Juice (home and comm. canned) 5423114 Dried Berries (not strawberries) (does not include ready-to-eat dinners; includes baby foods except mixtures)	6320- Other Berries 6321- Other Berries 6341101 Cranberry salad 6410460 Blackberry Juice 64105- Cranberry Juice (includes baby food; except mixtures)
Peaches	5036- Fresh Peaches 51224- Comm. Canned Peaches (incl. baby) 5223601 Comm. Frozen Peaches 5332405 Home Canned Peach Juice 5423105 Dried Peaches (baby) 5423106 Dried Peaches (does not include ready-to-eat dinners; includes baby foods except mixtures)	62116- Dried Peaches 63135- Peaches 6412203 Peach Juice 6420501 Peach Nectar 67108- Peaches, baby 6711450 Peaches, dry, baby (includes baby food; except mixtures)
Pears	5037- Fresh Pears 51225- Comm. Canned Pears (incl. baby) 5332403 Comm. Canned Pear Juice, baby 5362204 Fresh Pear Juice 5423107 Dried Pears (does not include ready-to-eat dinners; includes baby foods except mixtures)	62119- Dried Pears 63137- Pears 6341201 Pear salad 6421501 Pear Nectar 67109- Pears, baby 6711455 Pears, dry, baby (includes baby food; except mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
EXPOSED/PROTECTED FRUITS/VEGETABLES, ROOT VEGETABLES		
Exposed Fruits	5022- Strawberries, fresh 5023101 Acerola, fresh 5023401 Currants, fresh 5031- Apples/Applesauce, fresh 5033- Berries other than Strawberries, fresh 5034- Cherries, fresh 5036- Peaches, fresh 5037- Pears, fresh 50381- Apricots, Nectarines, Loquats, fresh 5038305 Dates, fresh 50384- Grapes, fresh 50386- Plums, fresh 50387- Rhubarb, fresh 5038805 Persimmons, fresh 5038901 Sapote, fresh 51221- Apples/Applesauce, canned 51222- Apricots, canned 51223- Cherries, canned 51224- Peaches, canned 51225- Pears, canned 51228- Berries, canned 5122903 Grapes with sugar, canned 5122904 Grapes without sugar, canned 5122905 Plums with sugar, canned 5122906 Plums without sugar, canned 5122907 Plums, canned, baby 5122911 Prunes, canned, baby 5122912 Prunes, with sugar, canned 5122913 Prunes, without sugar, canned 5122914 Raisin Pie Filling 5222- Frozen Strawberries 52231- Apples Slices, frozen 52233- Berries, frozen 52234- Cherries, frozen 52236- Peaches, frozen 52239- Rhubarb, frozen 53321- Canned Apple Juice 53322- Canned Grape Juice	62101- Apple, dried 62104- Apricot, dried 62108- Currants, dried 62110- Date, dried 62116- Peaches, dried 62119- Pears, dried 62121- Plum, dried 62122- Prune, dried 62125- Raisins 63101- Apples/applesauce 63102- Wi-apple 63103- Apricots 63111- Cherries, maraschino 63112- Acerola 63113- Cherries, sour 63115- Cherries, sweet 63117- Currants, raw 63123- Grapes 6312601 Juneberry 63131- Nectarine 63135- Peach 63137- Pear 63139- Persimmons 63143- Plum 63146- Quince 63147- Rhubarb/Sapodillo 632- Berries 64101- Apple Cider 64104- Apple Juice 64105- Cranberry Juice 64116- Grape Juice 64122- Peach Juice 64132- Prune/Strawberry Juice 6420101 Apricot Nectar 64205- Peach Nectar 64215- Pear Nectar 67102- Applesauce, baby 67108- Peaches, baby

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Exposed Fruits (continued)	5332402 Canned Prune Juice 5332403 Canned Pear Juice 5332404 Canned Blackberry Juice 5332405 Canned Peach Juice 53421- Frozen Grape Juice 5342201 Frozen Apple Juice, comm. fr. 5342202 Frozen Apple Juice, home fr. 5352101 Apple Juice, asep. packed 5352201 Grape Juice, asep. packed 5362101 Apple Juice, fresh 5362202 Apricot Juice, fresh 5362203 Grape Juice, fresh 5362204 Pear Juice, fresh 5362205 Prune Juice, fresh 5421- Dried Prunes 5422- Raisins, Currants, dried 5423101 Dry Apples 5423102 Dry Apricots 5423103 Dates without pits 5423104 Dates with pits 5423105 Peaches, dry, baby 5423106 Peaches, dry 5423107 Pears, dry 5423114 Berries, dry 5423115 Cherries, dry (includes baby foods)	67109- Pears, baby 6711450 Peaches, baby, dry 6711455 Pears, baby, dry 67202- Apple Juice, baby 6720380 White Grape Juice, baby 67212- Pear Juice, baby (includes baby foods/juices except mixtures; excludes fruit mixtures)
Protected Fruits	501- Citrus Fruits, fresh 5021- Cantaloupe, fresh 5023201 Mangoes, fresh 5023301 Guava, fresh 5023601 Kiwi, fresh 5023701 Papayas, fresh 5023801 Passion Fruit, fresh 5032- Bananas, Plantains, fresh 5035- Melons other than Cantaloupe, fresh 50382- Avocados, fresh 5038301 Figs, fresh 5038302 Figs, cooked 5038303 Figs, home canned 5038304 Figs, home frozen 50385- Pineapple, fresh 5038801 Pomegranates, fresh 5038902 Cherimoya, fresh 5038903 Jackfruit, fresh 5038904 Breadfruit, fresh 5038905 Tamarind, fresh 5038906 Carambola, fresh 5038907 Longan, fresh 5121- Citrus, canned 51226- Pineapple, canned 5122901 Figs with sugar, canned 5122902 Figs without sugar, canned 5122909 Bananas, canned, baby 5122910 Bananas and Pineapple, canned, baby 5122915 Litchis, canned	61- Citrus Fr., Juices (incl. cit. juice mixtures) 62107- Bananas, dried 62113- Figs, dried 62114- Lychees/Papayas, dried 62120- Pineapple, dried 62126- Tamarind, dried 63105- Avocado, raw 63107- Bananas 63109- Cantaloupe, Carambola 63110- Cassaba Melon 63119- Figs 63121- Genip 63125- Guava/Jackfruit, raw 6312650 Kiwi 6312651 Lychee, raw 6312660 Lychee, cooked 63127- Honeydew 63129- Mango 63133- Papaya 63134- Passion Fruit 63141- Pineapple 63145- Pomegranate 63148- Sweetsop, Soursop, Tamarind 63149- Watermelon 64120- Papaya Juice 64121- Passion Fruit Juice 64124- Pineapple Juice 64133- Watermelon Juice 6420150 Banana Nectar

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Protected Fruits (continued)	5122916 Mangos with sugar, canned 5122917 Mangos without sugar, canned 5122918 Mangos, canned, baby 5122920 Guava with sugar, canned 5122921 Guava without sugar, canned 5122923 Papaya with sugar, canned 5122924 Papaya without sugar, canned 52232- Bananas, frozen 52235- Melon, frozen 52237- Pineapple, frozen 5331- Canned Citrus Juices 53323- Canned Pineapple Juice 5332408 Canned Papaya Juice 5332410 Canned Mango Juice 5332501 Canned Papaya Concentrate 5341- Frozen Citrus Juice 5342203 Frozen Pineapple Juice 5351- Citrus and Citrus Blend Juices, asep. packed 5352302 Pineapple Juice, asep. packed 5361- Fresh Citrus and Citrus Blend Juices 5362206 Papaya Juice, fresh 5362207 Pineapple-Coconut Juice, fresh 5362208 Mango Juice, fresh 5362209 Pineapple Juice, fresh 5423108 Pineapple, dry 5423109 Papaya, dry 5423110 Bananas, dry 5423111 Mangos, dry 5423117 Litchis, dry 5423118 Tamarind, dry 5423119 Plantain, dry (includes baby foods)	64202- Cantaloupe Nectar 64203- Guava Nectar 64204- Mango Nectar 64210- Papaya Nectar 64213- Passion Fruit Nectar 64221- Soursop Nectar 6710503 Bananas, baby 6711500 Bananas, baby, dry 6720500 Orange Juice, baby 6721300 Pineapple Juice, baby (includes baby foods/juices except mixtures; excludes fruit mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition		Individual Code	
Exposed Veg.	491-	Fresh Dark Green Vegetables	721-	Dark Green Leafy Veg.
	493-	Fresh Tomatoes	722-	Dark Green Non-Leafy Veg.
	4941-	Fresh Asparagus	74-	Tomatoes and Tomato Mixtures
	4943-	Fresh Beans, Snap or Wax	7510050	Alfalfa Sprouts
	4944-	Fresh Cabbage	7510075	Artichoke, Jerusalem, raw
	4945-	Fresh Lettuce	7510080	Asparagus, raw
	4946-	Fresh Okra	75101-	Beans, sprouts and green, raw
	49481-	Fresh Artichokes	7510275	Brussel Sprouts, raw
	49483-	Fresh Brussel Sprouts	7510280	Buckwheat Sprouts, raw
	4951-	Fresh Celery	7510300	Cabbage, raw
	4952-	Fresh Cucumbers	7510400	Cabbage, Chinese, raw
	4955-	Fresh Cauliflower	7510500	Cabbage, Red, raw
	4958103	Fresh Kohlrabi	7510700	Cauliflower, raw
	4958111	Fresh Jerusalem Artichokes	7510900	Celery, raw
	4958112	Fresh Mushrooms	7510950	Chives, raw
	4958113	Mushrooms, home canned	7511100	Cucumber, raw
	4958114	Mushrooms, home frozen	7511120	Eggplant, raw
	4958118	Fresh Eggplant	7511200	Kohlrabi, raw
	4958119	Eggplant, cooked	75113-	Lettuce, raw
	4958120	Eggplant, home frozen	7511500	Mushrooms, raw
	4958200	Fresh Summer Squash	7511900	Parsley
	4958201	Summer Squash, cooked	7512100	Pepper, hot chili
	4958202	Summer Squash, home canned	75122-	Peppers, raw
	4958203	Summer Squash, home frozen	7512750	Seaweed, raw
	4958402	Fresh Bean Sprouts	7512775	Snowpeas, raw
	4958403	Fresh Alfalfa Sprouts	75128-	Summer Squash, raw
	4958504	Bamboo Shoots	7513210	Celery Juice
	4958506	Seaweed	7514100	Cabbage or Cole Slaw
	4958508	Tree Fern, fresh	7514130	Chinese Cabbage Salad
	4958601	Sauerkraut	7514150	Celery with cheese
	5111-	Dark Green Vegetables (all are exposed)	75142-	Cucumber salads
	5113-	Tomatoes	75143-	Lettuce salads
	5114101	Asparagus, comm. canned	7514410	Lettuce, wilted with bacon dressing
	51144-	Beans, green, snap, yellow, comm. canned	7514600	Greek salad
	5114704	Snow Peas, comm. canned	7514700	Spinach salad
	5114801	Sauerkraut, comm. canned	7520600	Algae, dried
	5114901	Artichokes, comm. canned	75201-	Artichoke, cooked
	5114902	Bamboo Shoots, comm. canned	75202-	Asparagus, cooked
	5114903	Bean Sprouts, comm. canned	75203-	Bamboo Shoots, cooked
	5114904	Cabbage, comm. canned	752049-	Beans, string, cooked
	5114905	Cabbage, comm. canned, no sauce	75205-	Beans, green, cooked/canned
	5114906	Cauliflower, comm. canned, no sauce	75206-	Beans, yellow, cooked/canned
	5114907	Eggplant, comm. canned, no sauce	75207-	Bean Sprouts, cooked
	5114913	Mushrooms, comm. canned	752085-	Breadfruit
	5114914	Okra, comm. canned	752090-	Brussel Sprouts, cooked
	5114918	Seaweeds, comm. canned	75210-	Cabbage, Chinese, cooked
	5114920	Summer Squash, comm. canned	75211-	Cabbage, green, cooked

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Exposed Veg. (cont.)	5114923 Chinese or Celery Cabbage, comm. canned 51152- Tomatoes, canned, low sod. 5115301 Asparagus, canned, low sod. 5115302 Beans, Green, canned, low sod. 5115303 Beans, Yellow, canned, low sod. 5115309 Mushrooms, canned, low sod. 51154- Greens, canned, low sod. 5115501 Sauerkraut, low sodium 5211- Dark Gr. Veg., comm. frozen (all exp.) 52131- Asparagus, comm. froz. 52133- Beans, snap, green, yellow, comm. froz. 5213407 Peapods, comm. froz. 5213408 Peapods, with sauce, comm. froz. 5213409 Peapods, with other veg., comm. froz. 5213701 Brussel Sprouts, comm. froz. 5213702 Brussel Sprouts, comm. froz. with cheese 5213703 Brussel Sprouts, comm. froz. with other veg. 5213705 Cauliflower, comm. froz. 5213706 Cauliflower, comm. froz. with sauce 5213707 Cauliflower, comm. froz. with other veg. 5213708 Caul., comm. froz. with other veg. & sauce 5213709 Summer Squash, comm. froz. 5213710 Summer Squash, comm. froz. with other veg. 5213716 Eggplant, comm. froz. 5213718 Mushrooms with sauce, comm. froz. 5213719 Mushrooms, comm. froz. 5213720 Okra, comm. froz. 5213721 Okra, comm. froz., with sauce 5311- Canned Tomato Juice and Tomato Mixtures 5312102 Canned Sauerkraut Juice 5321- Frozen Tomato Juice 5371- Fresh Tomato Juice 5381102 Aseptically Packed Tomato Juice 5413101 Dry Algae 5413102 Dry Celery 5413103 Dry Chives 5413109 Dry Mushrooms 5413111 Dry Parsley 5413112 Dry Green Peppers 5413113 Dry Red Peppers 5413114 Dry Seaweed 5413115 Dry Tomatoes (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	75212- Cabbage, red, cooked 752130- Cabbage, savoy, cooked 75214- Cauliflower 75215- Celery, Chives, Christophine (chayote) 752167- Cucumber, cooked 752170- Eggplant, cooked 752171- Fern shoots 752172- Fern shoots 752173- Flowers of sesbania, squash or lily 7521801 Kohlrabi, cooked 75219- Mushrooms, cooked 75220- Okra/lettuce, cooked 7522116 Palm Hearts, cooked 7522121 Parsley, cooked 75226- Peppers, pimento, cooked 75230- Sauerkraut, cooked/canned 75231- Snowpeas, cooked 75232- Seaweed 75233- Summer Squash 7540050 Artichokes, stuffed 7540101 Asparagus, creamed or with cheese 75403- Beans, green with sauce 75404- Beans, yellow with sauce 7540601 Brussel Sprouts, creamed 7540701 Cabbage, creamed 75409- Cauliflower, creamed 75410- Celery/Chiles, creamed 75412- Eggplant, fried, with sauce, etc. 75413- Kohlrabi, creamed 75414- Mushrooms, Okra, fried, stuffed, creamed 754180- Squash, baked, fried, creamed, etc. 7541822 Christophine, creamed 7550011 Beans, pickled 7550051 Celery, pickled 7550201 Cauliflower, pickled 755025- Cabbage, pickled 7550301 Cucumber pickles, dill 7550302 Cucumber pickles, relish 7550303 Cucumber pickles, sour 7550304 Cucumber pickles, sweet 7550305 Cucumber pickles, fresh 7550307 Cucumber, Kim Chee 7550308 Eggplant, pickled 7550311 Cucumber pickles, dill, reduced salt 7550314 Cucumber pickles, sweet, reduced salt 7550500 Mushrooms, pickled 7550700 Okra, pickled 75510- Olives 7551101 Peppers, hot 7551102 Peppers, pickled 7551301 Seaweed, pickled 7553500 Zucchini, pickled 76102- Dark Green Veg., baby 76401- Beans, baby (excl. most soups & mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Protected Veg.	4922- Fresh Pumpkin, Winter Squash 4942- Fresh Lima Beans 4947- Fresh Peas 49482- Fresh Soy Beans 4956- Fresh Corn 4958303 Succotash, home canned 4958304 Succotash, home frozen 4958401 Fresh Cactus (prickly pear) 4958503 Burdock 4958505 Bitter Melon 4958507 Horseradish Tree Pods 51122- Comm. Canned Pumpkin and Squash (baby) 51142- Beans, comm. canned 51143- Beans, lima and soy, comm. canned 51146- Corn, comm. canned 5114701 Peas, green, comm. canned 5114702 Peas, baby, comm. canned 5114703 Peas, blackeyed, comm. canned 5114705 Pigeon Peas, comm. canned 5114919 Succotash, comm. canned 5115304 Lima Beans, canned, low sod. 5115306 Corn, canned, low sod. 5115307 Creamed Corn, canned, low sod. 511531- Peas and Beans, canned, low sod. 52122- Winter Squash, comm. froz. 52132- Lima Beans, comm. froz. 5213401 Peas, gr., comm. froz. 5213402 Peas, gr., with sauce, comm. froz. 5213403 Peas, gr., with other veg., comm. froz. 5213404 Peas, gr., with other veg., comm. froz. 5213405 Peas, blackeyed, comm. froz. 5213406 Peas, blackeyed, with sauce, comm. froz. 52135- Corn, comm. froz. 5213712 Artichoke Hearts, comm. froz. 5213713 Baked Beans, comm. froz. 5213717 Kidney Beans, comm. froz. 5213724 Succotash, comm. froz. 5411- Dried Beans 5412- Dried Peas and Lentils 5413104 Dry Corn 5413106 Dry Hominy 5413504 Dry Squash, baby 5413603 Dry Creamed Corn, baby (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	732- Pumpkin 733- Winter Squash 7510200 Lima Beans, raw 7510550 Cactus, raw 7510960 Corn, raw 7512000 Peas, raw 7520070 Aloe vera juice 752040- Lima Beans, cooked 752041- Lima Beans, canned 7520829 Bitter Melon 752083- Bitter Melon, cooked 7520950 Burdock 752131- Cactus 752160- Corn, cooked 752161- Corn, yellow, cooked 752162- Corn, white, cooked 752163- Corn, canned 7521749 Hominy 752175- Hominy 75223- Peas, cowpeas, field or blackeyed, cooked 75224- Peas, green, cooked 75225- Peas, pigeon, cooked 75301- Succotash 75402- Lima Beans with sauce 75411- Corn, scalloped, fritter, with cream 7541650 Pea salad 7541660 Pea salad with cheese 75417- Peas, with sauce or creamed 7550101 Corn relish 76205- Squash, yellow, baby 76405- Corn, baby 76409- Peas, baby 76411- Peas, creamed, baby (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Root Vegetables	48- Potatoes, Sweetpotatoes 4921- Fresh Carrots 4953- Fresh Onions, Garlic 4954- Fresh Beets 4957- Fresh Turnips 4958101 Fresh Celeriac 4958102 Fresh Horseradish 4958104 Fresh Radishes, no greens 4958105 Radishes, home canned 4958106 Radishes, home frozen 4958107 Fresh Radishes, with greens 4958108 Fresh Salsify 4958109 Fresh Rutabagas 4958110 Rutabagas, home frozen 4958115 Fresh Parsnips 4958116 Parsnips, home canned 4958117 Parsnips, home frozen 4958502 Fresh Lotus Root 4958509 Ginger Root 4958510 Jicama, including yambean 51121- Carrots, comm. canned 51145- Beets, comm. canned 5114908 Garlic Pulp, comm. canned 5114910 Horseradish, comm. prep. 5114915 Onions, comm. canned 5114916 Rutabagas, comm. canned 5114917 Salsify, comm. canned 5114921 Turnips, comm. canned 5114922 Water Chestnuts, comm. canned 51151- Carrots, canned, low sod. 5115305 Beets, canned, low sod. 5115502 Turnips, low sod. 52121- Carrots, comm. froz. 5213714 Beets, comm. froz. 5213722 Onions, comm. froz. 5213723 Onions, comm. froz., with sauce 5213725 Turnips, comm. froz. 5312103 Canned Carrot Juice 5312104 Canned Beet Juice 5372102 Fresh Carrot Juice 5413105 Dry Garlic 5413110 Dry Onion 5413502 Dry Carrots, baby 5413503 Dry Sweet Potatoes, baby (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	71- White Potatoes and Puerto Rican St. Veg. 7310- Carrots 7311140 Carrots in sauce 7311200 Carrot chips 734- Sweetpotatoes 7510250 Beets, raw 7511150 Garlic, raw 7511180 Jicama (yambean), raw 7511250 Leeks, raw 75117- Onions, raw 7512500 Radish, raw 7512700 Rutabaga, raw 7512900 Turnip, raw 752080- Beets, cooked 752081- Beets, canned 7521362 Cassava 7521740 Garlic, cooked 7521771 Horseradish 7521850 Lotus root 752210- Onions, cooked 7522110 Onions, dehydrated 752220- Parsnips, cooked 75227- Radishes, cooked 75228- Rutabaga, cooked 75229- Salsify, cooked 75234- Turnip, cooked 75235- Water Chestnut 7540501 Beets, harvard 75415- Onions, creamed, fried 7541601 Parsnips, creamed 7541810 Turnips, creamed 7550021 Beets, pickled 7550309 Horseradish 7551201 Radishes, pickled 7553403 Turnip, pickled 76201- Carrots, baby 76209- Sweetpotatoes, baby 76403- Beets, baby (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
USDA SUBCATEGORIES		
Dark Green Vegetables	491- Fresh Dark Green Vegetables 5111- Comm. Canned Dark Green Veg. 51154- Low Sodium Dark Green Veg. 5211- Comm. Frozen Dark Green Veg. 5413111 Dry Parsley 5413112 Dry Green Peppers 5413113 Dry Red Peppers (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures/dinners; excludes vegetable juices and dried vegetables)	72- Dark Green Vegetables all forms leafy, nonleafy, dk. gr. veg. soups

Table 13B-1. Food Codes and Definitions for Individual Food Items Used in Analysis of the 1987–1988 USDA NFCS Household Data to Estimate Fraction of Food Intake That Is Home-Produced (continued)

Food Product	Household Code/Definition	Individual Code
Deep Yellow Vegetables	492- Fresh Deep Yellow Vegetables 5112- Comm. Canned Deep Yellow Veg. 51151- Low Sodium Carrots 5212- Comm. Frozen Deep Yellow Veg. 5312103 Carrot Juice 54135- Dry Carrots, Squash, Sw. Potatoes (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures/dinners; excludes vegetable juices and dried vegetables)	73- Deep Yellow Vegetables all forms carrots, pumpkin, squash, sweet potatoes, dp. yell. veg. soups
Other Vegetables	494- Fresh Light Green Vegetables 495- Fresh Other Vegetables 5114- Comm. Canned Other Veg. 51153- Low Sodium Other Veg. 51155- Low Sodium Other Veg. 5213- Comm. Frozen Other Veg. 5312102 Sauerkraut Juice 5312104 Beet Juice 5411- Dried Beans 5412- Dried Peas, Lentils 541310- Dried Other Veg. 5413114 Dry Seaweed 5413603 Dry Cr. Corn, baby (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures/dinners; excludes vegetable juices and dried vegetables)	75- Other Vegetables all forms
Citrus Fruits	501- Fresh Citrus Fruits 5121- Comm. Canned Citrus Fruits 5331- Canned Citrus and Citrus Blend Juice 5341- Frozen Citrus and Citrus Blend Juice 5351- Aseptically Packed Citrus and Citr. Blend Juice 5361- Fresh Citrus and Citrus Blend Juice (includes baby foods; excludes dried fruits)	61- Citrus Fruits and Juices 6720500 Orange Juice, baby food 6720600 Orange-Apricot Juice, baby food 6720700 Orange-Pineapple Juice, baby food 6721100 Orange-Apple-Banana Juice, baby food (excludes dried fruits)
Other Fruits	502- Fresh Other Vitamin C-Rich Fruits 503- Fresh Other Fruits 5122- Comm. Canned Fruits Other than Citrus 5222- Frozen Strawberries 5223- Frozen Other than Citr. or Vitamin C-Rich Fr. 5332- Canned Fruit Juice Other than Citrus 5342- Frozen Juices Other than Citrus 5352- Aseptically Packed Fruit Juice Other than Citr. 5362- Fresh Fruit Juice Other than Citrus 542- Dry Fruits (includes baby foods; excludes dried fruits)	62- Dried Fruits 63- Other Fruits 64- Fruit Juices and Nectars Excluding Citrus 671- Fruits, baby 67202- Apple Juice, baby 67203- Baby Juices 67204- Baby Juices 67212- Baby Juices 67213- Baby Juices 673- Baby Fruits 674- Baby Fruits

14. TOTAL FOOD INTAKE

14.1. INTRODUCTION

The U.S. food supply is generally considered to be one of the safest in the world. Nevertheless, contamination of foods may occur as a result of environmental pollution of the air, water, or soil, or the intentional use of chemicals such as pesticides or other agrochemicals. Ingestion of contaminated foods is a potential pathway of exposure to such contaminants. To assess chemical exposure through this pathway, information on food ingestion rates is needed. Chapters 9 through 13 of this handbook report per capita and consumer-only data on food consumption rates for various food items and food categories. These intake rates were estimated by the U.S. Environmental Protection Agency (EPA) using databases developed by the U.S. Department of Agriculture (USDA). U.S. EPA (2007) expanded the analysis of food intake in order to examine individuals' food consumption habits in greater detail. Using data from the USDA's Continuing Survey of Food Intake by Individuals (CSFII) conducted in 1994−1996 and 1998, U.S. EPA (2007) derived distributions to characterize (1) the total food intake among various groups in the U.S. population, subdivided by age, race, geographic region, and urbanization; (2) the contribution of various food categories (e.g., meats, grains, vegetables, etc.) to total food intake among these populations; and (3) the contribution of various food categories to total food intake among individuals exhibiting low- or high-end consumption patterns of a specific food category (e.g., individuals below the 10^{th} percentile or above the 90^{th} percentile for fish consumption). These data may be useful for assessing exposure among populations exhibiting lower or higher than usual intake of certain types of foods (e.g., people who eat little or no meat, or people who eat large quantities of fish). Recently, U.S. EPA's Office of Pesticide Programs (OPP) used data from the 2003 to 2006 National Health and Nutrition Examination Survey (NHANES) to estimate intake of various foods, including total foods.

The recommendations for total food intake rates are provided in the next section, along with a summary of the confidence ratings for these recommendations. Following the recommendations, the studies on total food intake are summarized.

14.2. RECOMMENDATIONS

Table 14-1 presents a summary of recommended values for total food intake. Table 14-2 presents the confidence ratings for these recommendations. The recommended total food intake rates are based on data from the U.S. EPA/OPP's recent analysis of NHANES data from 2003 to 2006. For information about the proportion of total intake represented by the major food groups, it is recommended that the data based on a re-analysis of the data from U.S. EPA (2007) be used. Section 14.4 describes this re-analysis, and Table 14-3 through Table 14-11 provide the data. However, it should be noted that, because the U.S. EPA (2007) data are based on 1994−1996 and 1998 CSFII data, they may not reflect recent changes that may have occurred in consumption patterns.

Both of the studies of total dietary intake presented in this chapter are based on data collected over a 2-day period and may not necessarily reflect the long-term distribution of average daily intake rates. However, because the broad categories of foods used in this analysis (e.g., total foods, total fruits, total vegetables, etc.) are typically eaten on a daily basis throughout the year with minimal seasonality, the short-term distribution may be a reasonable approximation of the long-term distribution, although it will display somewhat increased variability. This implies that the upper percentiles shown here will tend to overestimate the corresponding percentiles of the true long-term distribution.

Table 14-1. Recommended Values for Per Capita Total Food Intake, Edible Portion, Uncooked Weight

Age Group (years)	Mean	95th Percentile	Multiple Percentiles	Source
	g/kg-day			
Children				
Birth to <1	91	208[c]	See Table 14-12	U.S. EPA/OPP analysis of NHANES 2003−2006
1 to <3	113	185[c]		
3 to <6	79	137		
6 to <11[a]	47	92		
11 to <16[b]	28	56		
16 to <21[b]	28	56		
Adults				
21 to <50	29	63		
≥50	29	59		

[a] Based on data for ages 6 to <13 years.

[b] Based on data for ages 13 to <20 years.

14.2.1. * [c] Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Note: Total food intake was defined as intake of the sum of all foods, beverages, and water ingested.

Table 14-2. Confidence in Recommendations for Total Food Intake

General Assessment Factors	Rationale	Rating
Soundness		High
Adequacy of Approach	The survey methodologies were adequate and the analytical approaches were competently executed. The study sizes were very large; sample sizes varied with age. The response rates were good. The studies analyzed primary data on recall of ingestion.	
Minimal (or Defined) Bias	No direct measurements were taken. The studies relied on survey data.	
Applicability and Utility		Medium
Exposure Factor of Interest	The analyses were specifically designed to address food intake.	
Representativeness	The populations studied were representative of the U.S. population.	
Currency	The data used were the most current data publicly available at the time the analysis was conducted for the handbook. However, the data used in the re-analysis of the U.S. EPA study are now 11−15 years old. The national trends in bodyweight,(increasing obesity prevalence) may in part be due to changes in food intake patterns.	
Data Collection Period	Ingestion rates were estimated based on short-term data collected in the CSFII 1994−1996, 1998 and NHANES 2003−2006.	
Clarity and Completeness		Medium
Accessibility	The NHANES and CSFII data are publicly available. The U.S. EPA (2007) report is available online.	
Reproducibility	The methodology was clearly presented; enough information was included to reproduce results.	
Quality Assurance	NHANES and CSFII follow strict QA/QC procedures. U.S. EPA's analysis of NHANES data has only been reviewed internally, but the methodology has been used in an analysis of previous data.	
Variability and Uncertainty		Medium
Variability in Population	Short term distributions of total intake were provided. The survey was not designed to capture long-term day-to-day variability.	
Uncertainty	The survey data were based on recall over a 2-day period. The U.S. EPA/OPP analysis of NHANES data included all foods, beverages, and water ingested. Beverages, sugar, candy, and sweets, and nuts and nut products were not included in the re-analysis of the U.S. EPA (2007) data. There is also some uncertainty associated with the translation of mixed foods (i.e., recipes) to food commodity ingredients in both studies.	
Evaluation and Review		Medium
Peer Review	The USDA CSFII survey received a high level of peer review. The U.S. EPA (2007) analysis was also peer reviewed; however, the re-analysis of these data using the new age categories for children was not peer reviewed outside the Agency. The methodology used in the NHANES 2003−2006 analysis is the same as used in previous peer-reviewed analysis conducted by U.S. EPA/OPP.	
Number and Agreement of Studies	Two studies were available for this factor.	
Overall Rating		**Medium**

14.3. STUDIES OF TOTAL FOOD INTAKE

14.4. U.S. EPA Re−Analysis of 1994−1996, 1998 Continuing Survey of Food Intake by Individuals (CSFII), Based on U.S. EPA (2007)—Analysis of Total Food Intake and Composition of Individual's Diet Based on U.S. Department of Agriculture's (USDA's) 1994−1996, 1998 CSFII

U.S. EPA's National Center for Environmental Assessment (NCEA) conducted an analysis to evaluate the total food intake of individuals in the United States using data from the USDA's 1994−1996, 1998 CSFII (USDA, 2000) and U.S. EPA's *Food Commodity Intake Database* (FCID) (U.S. EPA, 2000). The 1994−1996 CSFII and its 1998 Supplemental Children's Survey were designed to obtain data from a statistically representative sample of non-institutionalized persons living in the United States. Survey participants were selected using a multistage process. The respondents were interviewed twice to collect information on food consumption during 2 non-consecutive days. For both survey days, data were collected by an in-home interviewer. The Day 2 interview was conducted 3 to10 days later and on a different day of the week. Of the more than 20,000 individuals surveyed, approximately 10,000 were under 21 years of age, and approximately 9,000 were under the age of 11. The 1994−1996 survey and 1998 supplement are referred to collectively as CSFII 1994−1996, 1998. Each individual in the survey was assigned a sample weight based on his or her demographic data; these weights were taken into account when calculating mean and percentile values of food consumption for the various demographic categories that were analyzed in the study. The sample weighting process used in the CSFII 1994−1996, 1998 is discussed in detail in USDA (2000).

For the analysis of total food intake, food commodity codes provided in U.S. EPA's FCID (U.S. EPA, 2000) were used to translate as-eaten foods (e.g., beef stew) identified by USDA food codes in the CSFII data set into food commodities (e.g., beef, potatoes, carrots, etc.). The method used to translate USDA food codes into U.S. EPA commodity codes is discussed in detail in USDA (2000). The U.S. EPA commodity codes were assigned to broad food categories (e.g., total meats, total vegetables, etc.) for use in the analysis. Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts (and nut products) were not included because they could not be categorized into the major food groups. Also, human milk intake was not included. Percent consuming, mean, standard error, and a range of percentile values were calculated on the basis of grams of food per kilogram of body weight per day (g/kg-day) and on the basis of grams per day (g/day). In addition to total food intake, intake of the various major food groups for the various age groups in units of g/day and g/kg-day were also estimated for comparison to total intake.

To evaluate variability in the contributions of the major food groups to total food intake, individuals were ranked from lowest to highest, based on total food intake. Three subsets of individuals were defined, as follows: a group at the low end of the distribution of total intake (below the 10^{th} percentile of total intake), a mid-range or central group (the 45^{th} to 55^{th} percentile of total intake), and a group at the high end of the distribution of total intake (above the 90^{th} percentile of total intake). Mean total food intake (in g/day and g/kg-day), mean intake of each of the major food groups (in g/day and g/kg-day), and the percent of total food intake that each of these food groups represents were calculated for each of the three populations (i.e., individuals with low-end, central, and high-end total food intake). A similar analysis was conducted to estimate the contribution of the major food groups to total food intake for individuals at the low-end, central, and high-end of the distribution of total meat intake, total dairy intake, total meat and dairy intake, total fish intake, and total fruit and vegetable intake. For example, to evaluate the variability in the diets of individuals at the low-end, mid-range, and high-end of the distribution of total meat intake, survey individuals were ranked according to their reported total meat intake. Three subsets of individuals were formed as described above. Mean total food intake, intake of the major food groups, and the percent of total food intake represented by each of the major food groups were tabulated. U.S. EPA (2007) presented the results of the analysis for the following age groups: <1 year, 1 to 2 years, 3 to 5 years, 6 to 11 years, 12 to 19 years, 20 to 39 years, 40 to 69 years, and 70 years and older. The data were tabulated in units of g/kg-day and g/day.

The analysis presented in U.S. EPA (2007) was conducted before U.S. EPA published the guidance entitled *Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). As a result, the age groups used for children in U.S. EPA (2007) were not

entirely consistent with the age groups recommended in the 2005 guidance. In order to conform to the standard age categories for children recommended in *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005), each of the tables from U.S. EPA (2007) was modified by re-analyzing the source data and applying the new childhood age categories (i.e., <1 month, 1 to <3 months, 3 to <6 months, 6 to <12 months, 1 to <2 years, 2 to <3 years, 3 to <6 years, 6 to <11 years, 11 to <16 years, and 16 to <21 years). Table 14-3 presents distributions of total food intake in units of g/day and g/kg-day. Table 14-4 and Table 14-5 compare total food intake to intake of the various major food groups for the various age groups in units of g/day and g/kg-day, respectively. It should be noted that some U.S. EPA commodity codes are listed under more than one food category. For this reason, in the tables, the intake rates for the individual food categories do not necessarily add up to the figure given for total food intake (U.S. EPA, 2007). Also, data are not reported for food groups for which there were less than 20 consumers in a particular age group. Table 14-6 through Table 14-11 present the contributions of the major food groups to total food intake for individuals (in the various age groups) at the low-end, central, and high-end of the distribution of total food intake (see Table 14-6), total meat intake (see Table 14-7), total meat and dairy intake (see Table 14-8), total fish intake (see Table 14-9), total fruit and vegetable intake (see Table 14-10), and total dairy intake (see Table 14-11) in units of g/day and g/kg-day. For each of the three classes of consumers, consumption of nine different food categories is presented (i.e., total foods, dairy, meats, fish, eggs, grains, vegetables, fruits, and fats). For example, in Table 14-9 one will find the mean consumption of meats, eggs, vegetables, etc. for individuals with an unusually high (or low or average) consumption of fish.

As discussed in previous chapters, the 1994−1996, 1998 CSFII data have both advantages and limitations with regard to estimating food intake rates. The large sample size (more than 20,000 persons) is sufficient to allow categorization within narrowly defined age categories. In addition, the survey was designed to obtain a statistically valid sample of the entire U.S. population that included children and low income groups. However, the survey design is of limited utility for assessing small and potentially at-risk populations based on ethnicity, medical status, geography, or other factors (such as activity level). Another limitation is that data are based on a 2-day survey period and, as such, may not accurately reflect long-term eating patterns. This is particularly true for the extremes of the distribution of food intake.

14.4.1. U.S. EPA Analysis of National Health and Nutrition Examination Survey (NHANES) 2003−2006 Data

U.S. EPA/OPP used data from the 2003 to 2006 NHANES to estimate intake of various individual foods, major food groups, and total foods. This chapter presents the data for total foods (Chapter 9 provides data on the intake of fruits and vegetables; Chapter 11 provides data on intake of meat, dairy products, and fats, and Chapter 12 provides data on intake of grain and grain products). The total intake rates presented here represent intake of all forms of foods eaten (e.g., both home produced and commercially produced). Individuals who provided data for 2 days of the survey were included in the intake estimates. Individuals who did not provide information on body weight or for whom identifying information was unavailable were excluded from the analysis. The U.S. EPA/OPP analysis of 2003−2006 NHANES data included all foods, beverages, and water ingested. Two-day average intake rates were calculated for all individuals in the database for each of the food items/groups. These average daily intake rates were divided by each individual's reported body weight to generate intake rates in units of grams per kilogram of body weight per day (g/kg-day). The data were weighted according to the 4-year, 2-day sample weights provided in the 2003−2006 NHANES to adjust the data for the sample population to reflect the national population.

Intake data from the NHANES were based on uncooked forms of the edible portion of the food items/groups. Summary statistics, including: number of individuals represented in the estimates, mean intake rate, and standard error of the mean intake rate were calculated for total foods. Percentiles of the intake rate distribution (i.e., 1^{st}, 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, 95^{th}, 99^{th}, and the maximum value) were also provided. The data represent per capita data. However, the intake rates are the same as those for consumers only because all survey respondents ate some type of food during the survey period. Data were provided for the following age groups: <1 year, 1 to <3 years, 3 to <6 years, 6 to <13 years, 13 to <20 years, 20 to <50 years, ≥50 years, females only—13 to 49 years, and all ages combined. Data were also generated for various racial/ethnic groups (i.e., Mexican American, non-Hispanic Black, non-Hispanic White, other Hispanic, and other race). Table 14-12 presents intake data for total foods in

g/kg-day from the 2003−2006 NHANES analysis for these age groups and racial/ethnic groups.

The strength of U.S. EPA's analysis is that it provides distributions of total food intake for various age groups of children and adults, normalized by body weight. The analysis uses the 2003−2006 NHANES data set, which was designed to be representative of the U.S. population. The data set includes 4 years of intake data combined, and is based on a 2-day survey period. Because these data were developed for use in U.S. EPA's pesticide registration program, the childhood age groups used are slightly different than those recommended in U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). However, given the similarities in the age groups used, the data should provide suitable intake estimates for the age groups of interest. The data for infants <12 months could not be separated out into the recommended age groups due to sample size limitations. This analysis generated data for total foods only. Analyses to estimate the proportion of total food intake represented by the various food groups were not conducted for this data set.

14.5. REFERENCES FOR CHAPTER 14

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Table 14-3. Per Capita Total Food Intake, Edible Portion, Uncooked[a]

Age Group	*N* cons.[b]	*N* Total[c]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Total Food Intake (g/day)															
Birth to <1 month	59	88	67.0	67	59	0	0	0	0	67	108	142	221	222	222
1 to <3 months	183	245	74.7	80	70	0	0	0	0	94	120	168	188	273	404
3 to <6 months	385	411	93.7	197	150	0	0	12	100	167	286	385	476	705	1,151
6 to <12 months	676	678	99.7	507	344	34	141	191	283	413	600	925	1,220	1,823	2,465
1 to <2 years	1,002	1,002	100	1,039	407	216	414	570	770	998	1,244	1,556	1,756	2,215	3,605
2 to <3 years	994	994	100	1,024	377	312	491	575	752	994	1,257	1,517	1,649	2,071	2,737
3 to <6 years	4,112	4,112	100	1,066	380	416	548	629	805	1,020	1,276	1,548	1,746	2,168	4,886
6 to <11 years	1,553	1,553	100	1,118	372	438	586	680	846	1,052	1,344	1,642	1,825	2,218	3,602
11 to <16 years	975	975	100	1,209	499	343	536	657	851	1,124	1,491	1,860	2,179	2,668	4,548
16 to <21 years	743	743	100	1,184	634	308	467	556	750	1,061	1,447	1,883	2,283	3,281	8,840
21 to <40 years	2,950	2,950	100	1,100	518	-	493	579	778	1,040	1,390	1,780	2,110	3,120	5,640
40 to <70 years	4,818	4,818	100	1,100	468	-	472	567	766	1,030	1,350	1,710	1,930	2,480	4,320
70 years and older	1,393	1,393	100	1,000	430	-	449	549	741	982	1,280	1,560	1,820	2,260	3,090
Total Food Intake (g/kg-day)															
Birth to <1 month	59	88	67.0	20	18	0	0	0	0	19	33	43	61	69	69
1 to <3 months	183	245	74.7	16	14	0	0	0	0	18	25	36	40	55	76
3 to <6 months	385	411	93.7	28	21	0	0	2	15	24	38	53	65	107	169
6 to <12 months	676	678	99.7	56	36	3	17	22	33	47	66	99	134	211	233
1 to <2 years	1,002	1,002	100	90	37	17	38	48	65	85	109	137	161	207	265
2 to <3 years	994	994	100	74	29	23	34	39	52	72	92	113	126	146	194
3 to <6 years	4,112	4,112	100	61	24	21	30	34	44	57	73	91	102	132	239
6 to <11 years	1,553	1,553	100	40	17	10	17	21	28	38	49	61	70	88	122
11 to <16 years	975	975	100	24	11	5	9	11	16	22	30	38	45	55	82
16 to <21 years	743	743	100	18	9	5	6	8	12	16	22	30	35	47	115
20 to <40 years	2,950	2,950	100	16	7	-	6	8	11	15	20	25	30	38	70
40 to <70 years	4,818	4,818	100	14	6	-	6	7	10	14	18	23	26	34	75
70 years and older	1,393	1,393	100	15	6	-	6	8	10	14	19	24	27	35	47

[a] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts (and nut products) were not included because they could not be categorized into the major food groups.

[b] Number of consumers. The number of consumers of total food may be less than the number of individuals in the study sample for the youngest age groups because human milk was not included in the total food intake estimates presented here.

[c] Sample size.

PC = Percent consuming.

SE = Standard error.

\- = Value not available.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 14-4. Per Capita Intake of Total Food and Intake of Major Food Groups (g/day, edible portion, uncooked)

Food Group	*N* cons[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: Birth to <1 month															
Total Food Intake[c]	59	88	67.0	67	59	0	0	0	0	67	108	142	221	222	222
Total Dairy Intake	51	88	58.0	41	38	0	0	0	0	40	72	81	156	156	156
Total Meat Intake	0	88	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Egg Intake	0	88	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Fish Intake	0	88	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Grain Intake	5	88	5.7	-	-	-	-	-	-	-	-	-	-	-	-
Total Vegetable Intake	27	88	30.7	5	23	0	0	0	0	0	0.29	16	32	108	125
Total Fruit Intake	2	88	2.3	-	-	-	-	-	-	-	-	-	-	-	-
Total Fat Intake	58	88	65.9	19	16	0	0	0	0	20	32	38	64	64	64
Age Group: 1 to <3 months															
Total Food Intake[c]	183	245	74.7	80	70	0	0	0	0	94	120	168	188	273	404
Total Dairy Intake	147	245	60.0	37	40	0	0	0	0	19	72	89	103	129	155
Total Meat Intake	1	245	0.4	-	-	-	-	-	-	-	-	-	-	-	-
Total Egg Intake	0	245	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Fish Intake	0	245	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Grain Intake	44	245	18.0	1	5	0	0	0	0	0	0	3	9	20	45
Total Vegetable Intake	88	245	35.9	15	33	0	0	0	0	0	0.92	74	94	119	211
Total Fruit Intake	23	245	9.4	4	21	0	0	0	0	0	0	0	31	114	171
Total Fat Intake	176	245	71.8	21	17	0	0	0	0	27	34	42	49	65	72
Age Group: 3 to <6 months															
Total Food Intake[c]	385	411	93.7	197	150	0	0	12	100	167	286	385	476	705	1,151
Total Dairy Intake	308	411	74.9	56	56	0	0	0	0	60	85	109	124	260	496
Total Meat Intake	44	411	10.7	2	7	0	0	0	0	0	0	1	13	29	92
Total Egg Intake	28	411	6.8	0.23	3	0	0	0	0	0	0	0	0.49	4	50
Total Fish Intake	1	411	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Total Grain Intake	284	411	69.1	8	11	0	0	0	0	4	11	21	27	44	68
Total Vegetable Intake	263	411	64.0	34	46	0	0	0	0	13	58	102	120	184	226
Total Fruit Intake	218	411	53.0	68	102	0	0	0	0	15	99	196	282	522	750
Total Fat Intake	357	411	86.9	28	17	0	0	0	20	30	38	45	53	81	106

Table 14-4. Per Capita Intake of Total Food and Intake of Major Food Groups (g/day, edible portion, uncooked) (continued)

Food Group	*N* cons.[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: 6 to <12 months															
Total Food Intake[c]	676	678	99.7	507	344	34	141	191	283	413	600	925	1,220	1,823	2,465
Total Dairy Intake	628	678	92.6	151	246	0	0	1.0	26	71	124	401	722	1,297	1,873
Total Meat Intake	500	678	73.7	22	27	0	0	0	0	14	32	59	78	117	269
Total Egg Intake	352	678	51.9	6	13	0	0	0	0	0	2	22	42	73	103
Total Fish Intake	34	678	5.0	0.62	3	0	0	0	0	0	0	0	0	21	42
Total Grain Intake	653	678	96.3	33	28	0	0.83	6	14	28	45	66	84	125	260
Total Vegetable Intake	662	678	97.6	91	67	0	2	14	41	81	127	180	231	285	452
Total Fruit Intake	639	678	94.2	169	142	0	0	17	70	147	232	335	425	670	1,254
Total Fat Intake	661	678	97.5	31	16	0	2	7	23	31	40	51	58	81	90
Age Group: 1 to <2 years															
Total Food Intake[c]	1,002	1,002	100	1,039	407	216	414	570	770	998	1,244	1,556	1,756	2,215	3,605
Total Dairy Intake	999	1,002	99.7	489	332	1	38	94	241	451	681	917	1,090	1,474	2,935
Total Meat Intake	965	1,002	96.3	47	37	0	0	6	20	39	66	100	120	181	221
Total Egg Intake	906	1,002	90.4	14	21	0	0	0	1	4	23	45	57	86	212
Total Fish Intake	188	1,002	18.8	3	10	0	0	0	0	0	0	11	21	45	135
Total Grain Intake	997	1,002	99.5	66	34	8	19	27	42	60	83	111	126	172	209
Total Vegetable Intake	1,000	1,002	99.8	120	75	9	25	37	68	107	155	220	255	402	739
Total Fruit Intake	986	1,002	98.4	254	204	0	4	30	99	209	349	532	664	828	1,762
Total Fat Intake	1,002	1,002	100	39	17	8	15	20	28	37	48	62	69	87	146
Age Group: 2 to <3 years															
Total Food Intake[c]	994	994	100	1,024	377	312	491	575	752	994	1,257	1,517	1,649	2,071	2,737
Total Dairy Intake	994	994	100	383	243	6	54	104	201	346	510	709	838	1,079	1,378
Total Meat Intake	981	994	98.7	60	41	0	8	14	31	51	80	115	139	199	280
Total Egg Intake	943	994	94.9	18	24	0	0	0	1	7	27	50	60	93	169
Total Fish Intake	190	994	19.1	4	12	0	0	0	0	0	0	13	26	53	127
Total Grain Intake	993	994	99.9	81	35	16	32	41	58	78	99	126	147	195	263
Total Vegetable Intake	994	994	100	145	89	18	45	57	86	128	178	249	302	431	846
Total Fruit Intake	970	994	97.6	279	230	0	2	25	117	231	382	594	750	992	2,042
Total Fat Intake	994	994	100	42	18	11	17	22	30	40	51	65	73	101	129

Table 14-4. Per Capita Intake of Total Food and Intake of Major Food Groups (g/day, edible portion, uncooked) (continued)

Food Group	*N* cons.[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: 3 to <6 years															
Total Food Intake[c]	4,112	4,112	100	1,066	380	416	548	629	805	1,020	1,276	1,548	1,746	2,168	4,886
Total Dairy Intake	4,112	4,112	100	392	249	14	68	121	224	356	522	706	805	1,151	3,978
Total Meat Intake	4,062	4,112	98.8	73	49	0	11	20	38	65	97	133	163	230	433
Total Egg Intake	3,910	4,112	95.1	16	23	0	0	0	1	6	24	47	59	99	290
Total Fish Intake	801	4,112	19.5	5	16	0	0	0	0	0	0	19	36	71	192
Total Grain Intake	4,111	4,112	100	101	41	29	44	54	72	95	122	155	175	230	410
Total Vegetable Intake	4,111	4,112	100	170	89	30	56	75	109	156	213	280	329	454	915
Total Fruit Intake	4,021	4,112	97.8	243	220	0	2	16	85	196	344	516	642	1,000	2,252
Total Fat Intake	4,112	4,112	100	50	19	14	23	27	36	47	60	74	85	113	167
Age Group: 6 to <11 years															
Total Food Intake[c]	1,553	1,553	100	1,118	372	438	586	680	846	1,052	1,344	1,642	1,825	2,218	3,602
Total Dairy Intake	1,553	1,553	100	408	243	10	63	126	229	371	557	741	837	1,130	2,680
Total Meat Intake	1,533	1,553	98.7	87	56	0	12	24	48	79	116	156	195	268	435
Total Egg Intake	1,490	1,553	95.9	16	22	0	0	0	2	6	22	46	58	107	163
Total Fish Intake	258	1,553	16.6	6	17	0	0	0	0	0	0	23	38	102	169
Total Grain Intake	1,553	1,553	100	119	48	31	54	67	87	114	143	179	201	262	513
Total Vegetable Intake	1,553	1,553	100	210	103	42	76	96	136	193	264	342	410	560	896
Total Fruit Intake	1,515	1,553	97.6	193	184	0	1	8	60	141	280	440	545	880	1,406
Total Fat Intake	1,553	1,553	100	58	22	16	27	33	42	56	70	86	95	121	168
Age Group: 11 to <16 years															
Total Food Intake[c]	975	975	100	1,209	499	343	536	657	851	1,124	1,491	1,860	2,179	2,668	4,548
Total Dairy Intake	975	975	100	368	291	1	25	43	152	307	507	740	948	1,401	1,972
Total Meat Intake	970	975	99.5	114	75	1	18	32	63	101	154	208	244	355	578
Total Egg Intake	930	975	95.4	19	27	0	0	0	2	7	25	53	72	123	244
Total Fish Intake	167	975	17.1	9	24	0	0	0	0	0	0	30	62	125	227
Total Grain Intake	975	975	100	136	63	33	56	70	93	127	168	212	249	333	645
Total Vegetable Intake	975	975	100	280	146	65	105	124	176	246	352	472	552	713	1,333
Total Fruit Intake	923	975	94.7	195	202	0	0	0.68	31	135	273	483	635	930	1,535
Total Fat Intake	975	975	100	69	33	18	28	34	47	64	83	110	131	176	321
Age Group: 16 to <21 years															
Total Food Intake[c]	743	743	100	1,184	634	308	467	556	750	1,061	1,447	1,883	2,283	3,281	8,840
Total Dairy Intake	742	743	99.9	283	279	0	8	19	63	196	410	649	934	1,235	1,866
Total Meat Intake	730	743	98.3	139	127	0	12	28	64	116	185	266	310	458	2,343
Total Egg Intake	703	743	94.6	21	30	0	0		1	7	29	59	89	126	223
Total Fish Intake	143	743	19.2	10	33	0	0	0	0	0	0	34	76	146	399
Total Grain Intake	743	743	100	150	93	13	48	58	88	132	190	256	307	543	730
Total Vegetable Intake	743	743	100	325	204	43	86	128	194	280	400	562	683	1,160	2,495
Total Fruit Intake	671	743	90.3	168	237	0	0	0	3	74	242	432	665	1,023	2,270
Total Fat Intake	743	743	100	74	42	13	22	30	46	67	94	129	148	213	391

Table 14-4. Per Capita Intake of Total Food and Intake of Major Food Groups (g/day, edible portion, uncooked) (continued)

Food Group	*N* cons.[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: 20 years and older															
Total Food Intake[c]	9,161	9,161	100	1,110	481	-	477	570	769	1,030	1,360	1,730	2,010	2,650	5,640
Total Dairy Intake	9,161	9,143	99.8	221	228	-	9	20	60	153	312	509	643	1,020	3,720
Total Meat Intake	9,161	9,005	98.3	130	90	-	15	35	65	111	171	246	299	457	1,010
Total Egg Intake	9,161	8,621	94.1	24	32	-	0	0.13	2	10	36	63	87	129	445
Total Fish Intake	9,161	2,648	28.9	15	36	-	0	0	0	0	12	56	86	162	434
Total Grain Intake	9,161	9,152	99.9	136	84	-	42	53	79	116	167	238	297	462	1,110
Total Vegetable Intake	9,161	9,161	100	309	171	-	91	124	191	281	394	525	626	850	1,810
Total Fruit Intake	9,161	8,566	93.5	191	224	-	0	0	18	125	280	473	625	996	2,690
Total Fat Intake	9,161	9,161	100	64	34	-	20	26	39	57	81	109	127	178	359

[a] Number of consumers. The number of consumers of total food may be less than the number of individuals in the study sample for the youngest age groups because human milk was not included in the total food intake estimates presented here.

[b] Sample size.

[c] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

PC = Percent consuming.

SE = Standard error.

- = Value not available or data not reported where the number of consumers was less than 20.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 14-5. Per Capita Intake of Total Food and Intake of Major Food Groups (g/kg-day, edible portion, uncooked)

Food Group	*N* cons[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: Birth to <1 month															
Total Food Intake[c]	59	88	67.0	20	18	0	0	0	0	19	33	43	61	69	69
Total Dairy Intake	51	88	58.0	12	12	0	0	0	0	13	21	25	43	49	49
Total Meat Intake	0	88	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Egg Intake	0	88	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Fish Intake	0	88	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Grain Intake	5	88	5.7	-	-	-	-	-	-	-	-	-	-	-	-
Total Vegetable Intake	27	88	30.7	2	6	0	0	0	0	0	0	4	12	30	35
Total Fruit Intake	2	88	2.3	-	-	-	-	-	-	-	-	-	-	-	-
Total Fat Intake	58	88	65.9	6	5	0	0	0	0	6	9	11	18	20	20
Age Group: 1 to <3 months															
Total Food Intake[c]	183	245	74.7	16	14	0	0	0	0	18	25	36	40	55	76
Total Dairy Intake	147	245	60.0	8	9	0	0	0	0	4	15	20	26	34	43
Total Meat Intake	1	245	0.4	-	-	-	-	-	-	-	-	-	-	-	-
Total Egg Intake	0	245	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Fish Intake	0	245	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Total Grain Intake	44	245	18.0	0	1	0	0	0	0	0	0	1	2	3	9
Total Vegetable Intake	88	245	35.9	3	6	0	0	0	0	0	0	13	17	26	34
Total Fruit Intake	23	245	9.4	1	5	0	0	0	0	0	0	0	7	19	43
Total Fat Intake	176	245	71.8	4	4	0	0	0	0	5	7	9	11	14	18
Age Group: 3 to <6 months															
Total Food Intake[c]	385	411	93.7	28	21	0	0	2	15	24	38	53	65	107	169
Total Dairy Intake	308	411	74.9	8	8	0	0	0	0	8	12	16	20	38	73
Total Meat Intake	44	411	10.7	0	1	0	0	0	0	0	0	0	1	4	13
Total Egg Intake	28	411	6.8	0	0	0	0	0	0	0	0	0	0	1	4
Total Fish Intake	1	411	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Total Grain Intake	284	411	69.1	1	2	0	0	0	0	1	1	3	4	6	10
Total Vegetable Intake	263	411	64.0	5	7	0	0	0	0	2	8	14	18	25	52
Total Fruit Intake	218	411	53.0	9	15	0	0	0	0	2	13	29	37	72	110
Total Fat Intake	357	411	86.9	4	3	0	0	0	2	4	6	7	8	12	17

Table 14-5. Per Capita Intake of Total Food and Intake of Major Food Groups (g/kg-day, edible portion, uncooked) (continued)

Food Group	*N* cons[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: 6 to <12 months															
Total Food Intake[c]	676	678	99.7	56	36	3	17	22	33	47	66	99	134	211	233
Total Dairy Intake	628	678	92.6	16	26	0	0	0	3	8	14	38	72	165	180
Total Meat Intake	500	678	73.7	2	3	0	0	0	0	1	4	6	8	12	30
Total Egg Intake	352	678	51.9	1	1	0	0	0	0	0	0	2	4	7	11
Total Fish Intake	34	678	5.0	0	0	0	0	0	0	0	0	0	0	2	4
Total Grain Intake	653	678	96.3	4	3	0	0	1	2	3	5	7	9	14	26
Total Vegetable Intake	662	678	97.6	10	8	0	0	2	5	9	14	20	25	34	67
Total Fruit Intake	639	678	94.2	19	16	0	0	2	8	16	26	36	46	84	138
Total Fat Intake	661	678	97.5	3	2	0	0	1	2	3	4	6	7	8	10
Age Group: 1 to <2 years															
Total Food Intake[c]	1,002	1,002	100	90	37	17	38	48	65	85	109	137	161	207	265
Total Dairy Intake	999	1,002	99.7	43	30	0	3	8	20	38	59	83	100	137	216
Total Meat Intake	965	1,002	96.3	4	3	0	0	1	2	3	6	8	10	14	21
Total Egg Intake	906	1,002	90.4	1	2	0	0	0	0	0	2	4	5	7	15
Total Fish Intake	188	1,002	18.8	0	1	0	0	0	0	0	0	1	2	3	12
Total Grain Intake	997	1,002	99.5	6	3	1	2	2	4	5	7	9	11	15	19
Total Vegetable Intake	1,000	1,002	99.8	10	7	1	2	3	6	9	14	19	22	33	61
Total Fruit Intake	986	1,002	98.4	22	18	0	0	3	9	18	31	44	58	81	144
Total Fat Intake	1,002	1,002	100	3	2	0.73	1	2	2	3	4	5	6	8	11
Age Group: 2 to <3 years															
Total Food Intake[c]	994	994	100	74	29	23	34	39	52	72	92	113	126	146	194
Total Dairy Intake	994	994	100	28	18	0	4	7	14	24	37	52	63	84	108
Total Meat Intake	981	994	98.7	4	3	0	1	1	2	4	6	8	9	14	20
Total Egg Intake	943	994	94.9	1	2	0	0	0	0	0	2	4	4	6	13
Total Fish Intake	190	994	19.1	0	1	0	0	0	0	0	0	1	2	4	11
Total Grain Intake	993	994	99.9	6	3	1	2	3	4	5	7	9	10	14	28
Total Vegetable Intake	994	994	100	10	6	1	3	4	6	9	13	18	22	34	64
Total Fruit Intake	970	994	97.6	20	17	0	0	2	8	16	27	44	56	71	114
Total Fat Intake	994	994	100	3	1	1	1	1	2	3	4	5	5	7	9

Table 14-5. Per Capita Intake of Total Food and Intake of Major Food Groups (g/kg-day, edible portion, uncooked) (continued)

Food Group	*N* cons[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: 3 to <6 years															
Total Food Intake[c]	4,112	4,112	100	61	24	21	30	34	44	57	73	91	102	132	239
Total Dairy Intake	4,112	4,112	100	22	15	1	4	7	12	20	30	41	48	66	195
Total Meat Intake	4,062	4,112	98.8	4	3	0	1	1	2	4	5	8	9	13	23
Total Egg Intake	3,910	4,112	95.1	1	1	0	0	0	0	0	1	3	3	5	13
Total Fish Intake	801	4,112	19.5	0	1	0	0	0	0	0	0	1	2	4	12
Total Grain Intake	4,111	4,112	100	6	3	2	2	3	4	5	7	9	10	14	27
Total Vegetable Intake	4,111	4,112	100	10	5	2	3	4	6	9	12	16	19	26	60
Total Fruit Intake	4,021	4,112	97.8	14	13	0	0	1	5	11	20	30	39	57	124
Total Fat Intake	4,112	4,112	100	3	1	1	1	2	2	3	3	4	5	6	10
Age Group: 6 to <11 years															
Total Food Intake[c]	1,553	1,553	100	40	17	10	17	21	28	38	49	61	70	88	122
Total Dairy Intake	1,553	1,553	100	15	10	0	2	4	7	13	20	27	33	42	79
Total Meat Intake	1,533	1,553	98.7	3	2	0	0	1	2	3	4	6	7	10	18
Total Egg Intake	1,490	1,553	95.9	1	1	0	0	0	0	0	1	2	2	4	8
Total Fish Intake	258	1,553	16.6	0	1	0	0	0	0	0	0	1	1	3	7
Total Grain Intake	1,553	1,553	100	4	2	1	2	2	3	4	5	7	8	11	16
Total Vegetable Intake	1,553	1,553	100	7	4	1	2	3	5	7	9	12	15	20	50
Total Fruit Intake	1,515	1,553	97.6	7	7	0	0	0	2	5	10	16	21	32	55
Total Fat Intake	1,553	1,553	100	2	1	1	1	1	1	2	3	3	4	5	9
Age Group: 11 to <16 years															
Total Food Intake[c]	975	975	100	24	11	5	9	11	16	22	30	38	45	55	82
Total Dairy Intake	975	975	100	7	6	0	0	1	3	6	10	15	20	29	38
Total Meat Intake	970	975	99.5	2	1	0	0	1	1	2	3	4	5	7	10
Total Egg Intake	930	975	95.4	0	1	0	0	0	0	0	0	1	1	3	7
Total Fish Intake	167	975	17.1	0	0	0	0	0	0	0	0	1	1	2	7
Total Grain Intake	975	975	100	3	1	1	1	1	2	2	3	5	5	7	9
Total Vegetable Intake	975	975	100	5	3	1	2	2	3	5	7	9	11	14	31
Total Fruit Intake	923	975	94.7	4	4	0	0	0	1	3	6	10	14	18	32
Total Fat Intake	975	975	100	1	1	0	0	1	1	1	2	2	3	4	5

Table 14-5. Per Capita Intake of Total Food and Intake of Major Food Groups (g/kg-day, edible portion, uncooked) (continued)

Food Group	*N* cons[a]	*N* total[b]	PC (%)	Mean	SE	Percentiles									
						1	5	10	25	50	75	90	95	99	Max
Age Group: 16 to <21 years															
Total Food Intake[c]	743	743	100	18	9	5	6	8	12	16	22	30	35	47	115
Total Dairy Intake	742	743	99.9	4	4	0	0	0	1	3	6	10	12	19	25
Total Meat Intake	730	743	98.3	2	2	0	0	0	1	2	3	4	5	7	30
Total Egg Intake	703	743	94.6	0	0	0	0	0	0	0	0	1	1	2	3
Total Fish Intake	143	743	19.2	0	1	0	0	0	0	0	0	1	1	2	7
Total Grain Intake	743	743	100	2	1	0	1	1	1	2	3	4	5	7	12
Total Vegetable Intake	743	743	100	5	3	1	1	2	3	4	6	8	10	15	32
Total Fruit Intake	671	743	90.3	3	4	0	0	0	0	1	4	7	10	16	29
Total Fat Intake	743	743	100	1	1	0	0	0	1	1	1	2	2	3	5
Age Group: 20 years and older															
Total Food Intake[c]	9,161	9,161	100	15	7	-	6	8	10	14	19	24	28	37	75
Total Dairy Intake	9,161	9,143	99.8	3	3	-	0	0	1	2	4	7	9	14	41
Total Meat Intake	9,161	9,005	98.3	2	1	-	0	0	1	2	2	3	4	6	13
Total Egg Intake	9,161	8,621	94.1	0	0	-	0	0	0	0	0	1	1	2	8
Total Fish Intake	9,161	2,648	28.9	0	0	-	0	0	0	0	0	1	1	2	8
Total Grain Intake	9,161	9,152	100	2	1	-	1	1	1	2	2	3	4	6	16
Total Vegetable Intake	9,161	9,161	100	4	2	-	1	2	3	4	5	7	9	12	28
Total Fruit Intake	9,161	8,566	93.5	3	3	-	0	0	0	2	4	7	9	15	52
Total Fat Intake	9,161	9,161	100	1	0	-	0	0	1	1	1	1	2	2	4

[a] Number of consumers. The number of consumers of total food may be less than the number of individuals in the study sample for the youngest age groups because human milk was not included in the total food intake estimates presented here.

[b] Sample size.

[c] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

PC = Percent consuming.
SE = Standard error.
- = Data not reported where the number of consumers was less than 20.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 14-6. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Food Intake

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/day)						
Total Foods[a]	0	0.0	64	100.0	196	100.0
Total Dairy	0	0.0	39	61.2	109	55.4
Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.0	0	0.0	4	2.1
Total Vegetables	0	0.0	5	7.4	24	12.1
Total Fruits	0	0.0	0	0.0	8	4.1
Total Fats[b]	0	0.0	19	29.4	52	26.2
Age Group: 1 to <3 months (g/day)						
Total Foods[a]	0	0.0	94	100.0	206	100.0
Total Dairy	0	0.0	53	56.9	63	30.8
Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.0	1	1.1	3	1.3
Total Vegetables	0	0.0	11	12.0	58	28.4
Total Fruits	0	0.0	0	0.0	27	13.0
Total Fats[b]	0	0.0	27	28.4	49	23.6
Age Group: 3 to <6 months (g/day)						
Total Foods[a]	1	100.0	166	100.0	507	100.0
Total Dairy	0	3.0	69	41.9	90	17.8
Total Meats	0	0.0	0	0.2	4	0.8
Total Fish	0	0.0	0	0.0	0	0.1
Total Eggs	0	0.0	1	0.3	1	0.1
Total Grains	1	74.5	8	4.9	14	2.8
Total Vegetables	0	10.9	27	16.3	73	14.4
Total Fruits	0	9.9	24	14.6	284	56.0
Total Fats[b]	0	1.3	34	20.4	36	7.2

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/kg-day)						
Total Foods[a]	0	0.0	20	100.0	58	100.0
Total Dairy	0	0.0	14	70.5	35	60.1
Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.0	0	0.0	1	2.1
Total Vegetables	0	0.0	0	0.1	6	10.0
Total Fruits	0	0.0	0	0.0	0	0.0
Total Fats[b]	0	0.0	6	29.4	16	27.8
Age Group: 1 to <3 months (g/kg-day)						
Total Foods[a]	0	0.0	18	100.0	44	100.0
Total Dairy	0	0.0	9	51.9	20	45.4
Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.0	0	1.1	0	0.5
Total Vegetables	0	0.0	3	18.9	7	16.4
Total Fruits	0	0.0	0	0.0	5	12.3
Total Fats[b]	0	0.0	5	27.7	11	24.4
Age Group: 3 to <6 months (g/kg-day)						
Total Foods[a]	0	100.0	24	100.0	73	100.0
Total Dairy	0	0.5	9	37.3	13	17.9
Total Meats	0	0.0	0	0.5	1	0.8
Total Fish	0	0.0	0	0.0	0	0.1
Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	85.0	1	4.0	2	3.4
Total Vegetables	0	7.4	5	20.8	11	14.5
Total Fruits	0	6.7	4	15.0	40	55.0
Total Fats[b]	0	0.2	5	21.3	5	7.5

Table 14-6. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Food Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 6 to <12 months (g/day)							Age Group: 6 to <12 months (g/kg-day)						
Total Foods[a]	124	100.0	414	100.0	1,358	100.0	Total Foods[a]	15	100.0	47	100.0	144	100.0
Total Dairy	33	26.4	72	17.5	770	56.7	Total Dairy	4	25.4	6	13.8	77	53.1
Total Meats	3	2.4	19	4.6	47	3.5	Total Meats	0	2.3	2	4.9	5	3.4
Total Fish	0	0.2	1	0.3	0	0.0	Total Fish	0	0.2	0	0.2	0	0.0
Total Eggs	1	0.5	7	1.6	8	0.6	Total Eggs	0	0.9	1	1.5	1	0.8
Total Grains	11	9.1	37	8.9	50	3.7	Total Grains	2	10.7	4	9.1	5	3.6
Total Vegetables	30	24.2	90	21.9	121	8.9	Total Vegetables	3	21.9	10	22.4	14	9.8
Total Fruits	30	24.4	151	36.5	314	23.1	Total Fruits	4	25.9	19	40.0	37	25.8
Total Fats[b]	14	11.6	35	8.4	44	3.2	Total Fats[b]	2	11.4	4	7.5	5	3.2
Age Group: 1 to <2 years (g/day)							Age Group: 1 to <2 years (g/kg-day)						
Total Foods[a]	407	100.0	998	100.0	1,859	100.0	Total Foods[a]	35	100.0	85	100.0	167	100.0
Total Dairy	113	27.8	487	48.8	1,008	54.2	Total Dairy	10	29.5	41	48.1	94	56.1
Total Meats	28	6.9	46	4.6	66	3.5	Total Meats	3	7.5	4	4.7	5	3.2
Total Fish	1	0.3	3	0.3	4	0.2	Total Fish	0	0.4	1	0.5	0	0.2
Total Eggs	9	2.2	16	1.6	22	1.2	Total Eggs	1	2.1	1	1.4	2	0.9
Total Grains	44	10.8	63	6.3	81	4.3	Total Grains	4	10.9	5	6.0	7	4.3
Total Vegetables	82	20.1	101	10.2	165	8.9	Total Vegetables	7	18.6	10	11.9	13	7.8
Total Fruits	100	24.6	238	23.8	446	24.0	Total Fruits	8	23.0	19	22.8	40	24.0
Total Fats[b]	24	5.8	38	3.8	61	3.3	Total Fats[b]	2	6.4	3	3.8	5	3.2
Age Group: 2 to <3 years (g/day)							Age Group: 2 to <3 years (g/kg-day)						
Total Foods[a]	448	100.0	989	100.0	1,760	100.0	Total Foods[a]	32	100.0	72	100.0	129	100.0
Total Dairy	118	26.3	370	37.4	698	39.7	Total Dairy	8	24.8	26	36.3	54	42.2
Total Meats	50	11.1	60	6.1	72	4.1	Total Meats	4	11.2	4	5.3	5	3.8
Total Fish	1	0.3	4	0.4	7	0.4	Total Fish	0	0.4	0	0.2	0	0.3
Total Eggs	12	2.7	14	1.4	24	1.4	Total Eggs	1	3.6	1	1.7	2	1.3
Total Grains	62	13.7	86	8.7	98	5.6	Total Grains	4	13.8	6	8.0	7	5.6
Total Vegetables	98	21.9	145	14.6	185	10.5	Total Vegetables	7	22.0	10	13.3	13	10.0
Total Fruits	70	15.6	255	25.8	609	34.6	Total Fruits	5	16.2	21	29.8	42	32.9
Total Fats[b]	31	6.8	44	4.4	56	3.2	Total Fats[b]	2	7.1	3	3.9	4	3.2

Table 14-6. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Food Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/day)							Age Group: 3 to <6 years (g/kg-day)						
Total Foods[a]	527	100.0	1,020	100.0	1,817	100.0	Total Foods[a]	28	100.0	57	100.0	108	100.0
Total Dairy	144	27.3	378	37.0	728	40.1	Total Dairy	8	27.3	21	36.3	43	40.3
Total Meats	53	10.0	72	7.0	94	5.2	Total Meats	3	10.4	4	7.1	5	4.8
Total Fish	3	0.6	5	0.5	9	0.5	Total Fish	0	0.5	0	0.5	0	0.4
Total Eggs	11	2.0	15	1.5	24	1.3	Total Eggs	1	2.1	1	1.6	1	1.1
Total Grains	76	14.4	103	10.1	132	7.3	Total Grains	4	14.0	6	9.9	8	7.1
Total Vegetables	117	22.3	163	16.0	233	12.8	Total Vegetables	6	22.0	9	16.0	14	12.5
Total Fruits	76	14.4	216	21.2	509	28.0	Total Fruits	4	15.2	13	22.1	31	29.0
Total Fats[b]	34	6.5	50	4.9	68	3.7	Total Fats[b]	2	6.4	3	4.8	4	3.7
Age Group: 6 to <11 years (g/day)							Age Group: 6 to <11 years (g/kg-day)						
Total Foods[a]	565	100.0	1,060	100.0	1,886	100.0	Total Foods[a]	16	100.0	38	100.0	73	100.0
Total Dairy	147	26.1	370	34.9	766	40.6	Total Dairy	4	26.2	15	38.6	30	40.8
Total Meats	65	11.4	95	9.0	104	5.5	Total Meats	2	11.9	3	8.1	4	5.9
Total Fish	2	0.3	6	0.6	10	0.5	Total Fish	0	0.5	0	0.5	0	0.4
Total Eggs	10	1.7	16	1.5	22	1.2	Total Eggs	0	1.8	1	1.6	1	1.3
Total Grains	89	15.8	116	10.9	157	8.3	Total Grains	2	14.7	4	10.8	7	9.0
Total Vegetables	136	24.1	203	19.2	294	15.6	Total Vegetables	4	24.7	7	18.0	11	15.5
Total Fruits	66	11.6	178	16.8	426	22.6	Total Fruits	2	11.2	6	14.9	15	21.2
Total Fats[b]	39	6.8	58	5.5	76	4.0	Total Fats[b]	1	7.3	2	5.3	3	4.3
Age Group: 11 to <16 years (g/day)							Age Group: 11 to <16 years (g/kg-day)						
Total Foods[a]	513	100.0	1,127	100.0	2,256	100.0	Total Foods[a]	8	100.0	22	100.0	46	100.0
Total Dairy	92	17.9	308	27.3	808	35.8	Total Dairy	1	17.3	6	26.9	18	38.4
Total Meats	71	13.9	116	10.3	172	7.6	Total Meats	1	14.7	2	10.3	3	7.0
Total Fish	4	0.8	7	0.6	16	0.7	Total Fish	0	0.9	0	0.8	0	0.8
Total Eggs	10	1.9	20	1.8	28	1.2	Total Eggs	0	1.8	0	2.2	1	1.3
Total Grains	84	16.3	133	11.8	207	9.2	Total Grains	1	16.6	3	11.7	4	9.3
Total Vegetables	162	31.6	258	22.9	459	20.3	Total Vegetables	3	31.7	5	23.4	9	18.4
Total Fruits	42	8.2	203	18.0	420	18.6	Total Fruits	1	7.2	4	17.4	8	18.2
Total Fats[b]	40	7.8	64	5.7	114	5.0	Total Fats[b]	1	8.3	1	5.9	2	4.8

Table 14-6. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Food Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 16 to <21 years (g/day)							Age Group: 16 to <21 years (g/kg-day)						
Total Foods[a]	438	100.0	1,060	100.0	2,590	100.0	Total Foods[a]	6	100.0	16	100.0	38	100.0
Total Dairy	56	12.8	219	20.7	759	29.3	Total Dairy	1	12.2	4	23.8	10	27.4
Total Meats	61	14.0	141	13.3	272	10.5	Total Meats	1	15.6	2	11.5	4	10.0
Total Fish	7	1.5	11	1.1	14	0.5	Total Fish	0	1.7	0	1.0	0	0.5
Total Eggs	8	1.9	17	1.6	29	1.1	Total Eggs	0	1.8	0	1.6	0	1.1
Total Grains	67	15.2	138	13.0	241	9.3	Total Grains	1	14.8	2	13.1	4	9.9
Total Vegetables	148	33.8	312	29.4	620	23.9	Total Vegetables	2	34.0	5	30.0	10	25.3
Total Fruits	48	11.0	138	13.1	487	18.8	Total Fruits	1	10.2	2	10.9	8	19.7
Total Fats[b]	33	7.6	72	6.8	136	5.3	Total Fats[b]	1	8.1	1	7.1	2	5.0
Age Group: 20 years and older (g/day)							Age Group: 20 years and older (g/kg-day)						
Total Foods[a]	451	100.0	1,030	100.0	2,140	100.0	Total Foods[a]	6	100.0	14	100.0	30	100.0
Total Dairy	55	12.1	188	18.3	520	24.3	Total Dairy	1	12.5	3	19.4	7	24.9
Total Meats	74	16.5	128	12.5	210	9.8	Total Meats	1	17.3	2	12.2	2	8.2
Total Fish	7	1.6	13	1.2	25	1.2	Total Fish	0	1.6	0	1.4	0	0.9
Total Eggs	15	3.2	23	2.3	34	1.6	Total Eggs	0	3.5	0	2.3	0	1.5
Total Grains	69	15.3	130	12.7	230	10.8	Total Grains	1	15.6	2	13.1	3	10.1
Total Vegetables	147	32.6	291	28.4	516	24.2	Total Vegetables	2	32.1	4	28.9	7	23.5
Total Fruits	40	8.9	174	17.0	466	21.8	Total Fruits	0	7.9	2	14.9	7	23.6
Total Fats[b]	34	7.6	60	5.9	105	4.9	Total Fats[b]	0	7.7	1	6.1	1	4.6

[a] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

[b] Includes added fats such as butter, margarine, dressings and sauces, vegetable oil, etc.; does not include fats eaten as components of other foods such as meats.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 14-7. Per Capita Intake of Total Foods[a] and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat Intake

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/day)[c]							Age Group: Birth to <1 month (g/kg-day)[c]						
Total Foods[a]	67	100.0	-	-	-	-	Total Foods[a]	20	100.0	-	-	-	-
Total Dairy	41	61.5	-	-	-	-	Total Dairy	12	61.6	-	-	-	-
Total Meats	0	0.0	-	-	-	-	Total Meats	0	0.0	-	-	-	-
Total Fish	0	0.0	-	-	-	-	Total Fish	0	0.0	-	-	-	-
Total Eggs	0	0.0	-	-	-	-	Total Eggs	0	0.0	-	-	-	-
Total Grains	0	0.7	-	-	-	-	Total Grains	0	0.7	-	-	-	-
Total Vegetables	5	7.7	-	-	-	-	Total Vegetables	2	7.7	-	-	-	-
Total Fruits	1	1.3	-	-	-	-	Total Fruits	0	1.1	-	-	-	-
Total Fats[b]	19	28.3	-	-	-	-	Total Fats[b]	6	28.4	-	-	-	-
Age Group: 1 to <3 months (g/day)[d]							Age Group: 1 to <3 months (g/kg-day)[d]						
Total Foods[a]	79	100.0	-	-	149	100.0	Total Foods[a]	16	100.0	-	-	47	100.0
Total Dairy	37	46.4	-	-	103	68.9	Total Dairy	8	47.9	-	-	32	68.9
Total Meats	0	0.0	-	-	1	0.7	Total Meats	0	0.0	-	-	0	0.7
Total Fish	0	0.0	-	-	0	0.0	Total Fish	0	0.0	-	-	0	0.0
Total Eggs	0	0.0	-	-	0	0.0	Total Eggs	0	0.0	-	-	0	0.0
Total Grains	1	1.5	-	-	0	0.1	Total Grains	0	1.4	-	-	0	0.1
Total Vegetables	15	18.6	-	-	3	2.1	Total Vegetables	3	16.8	-	-	1	2.1
Total Fruits	4	5.2	-	-	0	0.0	Total Fruits	1	5.6	-	-	0	0.0
Total Fats[b]	21	26.4	-	-	42	28.2	Total Fats[b]	4	26.5	-	-	13	28.2
Age Group: 3 to <6 months (g/day)[e]							Age Group: 3 to <6 months (g/kg-day)[e]						
Total Foods[a]	181	100.0	-	-	316	100.0	Total Foods[a]	26	100.0	-	-	41	100.0
Total Dairy	55	30.1	-	-	62	19.7	Total Dairy	8	30.6	-	-	8	20.5
Total Meats	0	0.0	-	-	16	4.9	Total Meats	0	0.0	-	-	2	4.9
Total Fish	0	0.0	-	-	0	0.1	Total Fish	0	0.0	-	-	0	0.1
Total Eggs	0	0.1	-	-	1	0.5	Total Eggs	0	0.0	-	-	0	0.3
Total Grains	7	3.7	-	-	16	5.0	Total Grains	1	3.7	-	-	2	4.8
Total Vegetables	31	17.0	-	-	56	17.9	Total Vegetables	4	16.9	-	-	7	17.6
Total Fruits	59	32.9	-	-	133	42.3	Total Fruits	8	32.2	-	-	17	41.7
Total Fats[b]	28	15.3	-	-	28	8.9	Total Fats[b]	4	15.6	-	-	4	9.2

Table 14-7. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
	Age Group: 6 to <12 months (g/day)							Age Group: 6 to <12 months (g/kg-day)					
Total Foods[a]	347	100.0	466	100.0	922	100.0	Total Foods[a]	40	100.0	48	100.0	99	100.0
Total Dairy	80	23.0	108	23.2	384	41.6	Total Dairy	9	22.6	11	23.9	41	41.1
Total Meats	0	0.0	14	2.9	85	9.3	Total Meats	0	0.0	1	3.0	9	9.3
Total Fish	0	0.0	0	0.1	0	0.0	Total Fish	0	0.0	0	0.1	0	0.0
Total Eggs	2	0.5	3	0.6	11	1.2	Total Eggs	0	0.5	0	1.0	1	0.9
Total Grains	24	6.8	29	6.2	51	5.6	Total Grains	3	6.6	3	6.0	6	5.8
Total Vegetables	69	19.8	116	24.8	135	14.7	Total Vegetables	8	19.7	10	21.9	15	15.4
Total Fruits	143	41.3	162	34.8	216	23.4	Total Fruits	17	41.9	17	36.5	23	23.1
Total Fats[b]	27	7.7	31	6.7	43	4.6	Total Fats[b]	2	7.8	3	7.1	5	4.6
	Age Group: 1 to <2 years (g/day)							Age Group: 1 to <2 years (g/kg-day)					
Total Foods[a]	921	100.0	992	100.0	1,229	100.0	Total Foods[a]	82	100.0	90	100.0	108	100.0
Total Dairy	464	50.4	483	48.7	460	37.4	Total Dairy	41	49.9	46	50.5	43	40.1
Total Meats	2	0.2	39	4.0	128	10.4	Total Meats	0	0.2	3	3.8	11	10.0
Total Fish	3	0.3	2	0.2	6	0.5	Total Fish	0	0.3	0	0.3	0	0.5
Total Eggs	8	0.9	14	1.5	24	1.9	Total Eggs	1	0.8	1	1.4	2	1.9
Total Grains	56	6.1	64	6.5	78	6.4	Total Grains	5	6.1	6	6.1	7	6.9
Total Vegetables	97	10.5	113	11.3	189	15.4	Total Vegetables	9	11.1	10	10.8	16	15.1
Total Fruits	250	27.2	228	23.0	290	23.6	Total Fruits	22	27.3	21	22.7	22	20.8
Total Fats[b]	30	3.3	38	3.8	57	4.6	Total Fats[b]	3	3.3	3	3.8	5	4.7
	Age Group: 2 to <3 years (g/day)							Age Group: 2 to <3 years (g/kg-day)					
Total Foods[a]	950	100.0	947	100.0	1,131	100.0	Total Foods[a]	71	100.0	68	100.0	83	100.0
Total Dairy	426	44.9	373	39.3	374	33.0	Total Dairy	31	44.2	26	37.7	27	32.3
Total Meats	7	0.7	52	5.4	148	13.1	Total Meats	1	0.7	4	5.5	10	12.4
Total Fish	4	0.5	4	0.5	2	0.2	Total Fish	0	0.5	0	0.3	0	0.2
Total Eggs	12	1.3	18	1.9	21	1.9	Total Eggs	1	1.3	1	1.3	2	1.8
Total Grains	73	7.7	76	8.1	90	8.0	Total Grains	6	7.8	6	8.3	7	8.1
Total Vegetables	104	10.9	146	15.4	202	17.9	Total Vegetables	8	11.1	10	15.1	14	16.8
Total Fruits	279	29.4	226	23.8	232	20.5	Total Fruits	21	29.6	18	26.7	19	23.1
Total Fats[b]	29	3.0	40	4.2	62	5.5	Total Fats[b]	2	3.1	3	4.0	4	5.2

Table 14-7. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/day)						
Total Foods[a]	991	100.0	1,037	100.0	1,246	100.0
Total Dairy	419	42.3	376	36.3	389	31.2
Total Meats	10	1.0	65	6.3	176	14.1
Total Fish	7	0.7	6	0.5	4	0.3
Total Eggs	10	1.0	16	1.5	24	1.9
Total Grains	98	9.9	101	9.8	117	9.4
Total Vegetables	128	13.0	170	16.4	217	17.4
Total Fruits	257	25.9	238	22.9	243	19.5
Total Fats[b]	35	3.6	48	4.7	73	5.9
Age Group: 6 to <11 years (g/day)						
Total Foods[a]	1,028	100.0	1,087	100.0	1,300	100.0
Total Dairy	424	41.3	386	35.5	382	29.4
Total Meats	11	1.1	79	7.3	206	15.8
Total Fish	6	0.6	5	0.5	4	0.3
Total Eggs	13	1.3	15	1.4	17	1.3
Total Grains	121	11.8	117	10.7	136	10.4
Total Vegetables	164	16.0	212	19.5	270	20.7
Total Fruits	214	20.8	191	17.6	198	15.2
Total Fats[b]	40	3.9	59	5.4	81	6.2
Age Group: 11 to <16 years (g/day)						
Total Foods[a]	1,043	100.0	1,194	100.0	1,606	100.0
Total Dairy	342	32.8	377	31.6	435	27.1
Total Meats	17	1.6	101	8.5	268	16.7
Total Fish	13	1.3	7	0.6	7	0.4
Total Eggs	17	1.6	13	1.1	21	1.3
Total Grains	116	11.1	144	12.1	159	9.9
Total Vegetables	227	21.7	260	21.8	404	25.2
Total Fruits	238	22.8	202	16.9	204	12.7
Total Fats[b]	44	4.2	67	5.6	106	6.6

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/kg-day)						
Total Foods[a]	57	100.0	59	100.0	74	100.0
Total Dairy	24	42.1	23	38.2	23	31.3
Total Meats	1	1.0	4	6.0	10	13.4
Total Fish	0	0.6	0	0.5	0	0.3
Total Eggs	1	1.0	1	1.4	1	2.0
Total Grains	6	9.9	6	9.5	7	9.4
Total Vegetables	7	13.0	9	15.8	13	17.5
Total Fruits	15	26.1	13	22.0	15	20.1
Total Fats[b]	2	3.6	3	4.8	4	5.7
Age Group: 6 to <11 years (g/kg-day)						
Total Foods[a]	36	100.0	39	100.0	51	100.0
Total Dairy	15	41.5	15	38.7	15	29.7
Total Meats	0	1.0	3	7.0	8	14.8
Total Fish	0	0.9	0.32	0.8	0	0.3
Total Eggs	0	1.2	0.42	1.1	1	1.5
Total Grains	4	11.5	4	10.7	5	10.4
Total Vegetables	5	15.1	7	19.1	10	20.2
Total Fruits	8	21.7	6	15.6	8	16.5
Total Fats[b]	1	3.8	2	5.1	3	6.0
Age Group: 11 to <16 years (g/kg-day)						
Total Foods[a]	19	100.0	22	100.0	33	100.0
Total Dairy	6	31.5	6	27.0	10	29.7
Total Meats	0	1.6	2	8.8	5	16.3
Total Fish	0	1.5	0	0.5	0	0.5
Total Eggs	0	1.5	0	1.3	0	1.4
Total Grains	2	11.6	3	11.7	3	10.0
Total Vegetables	4	22.2	5	24.1	8	23.3
Total Fruits	4	23.1	4	18.9	4	11.7
Total Fats[b]	1	4.4	1	5.7	2	6.7

Table 14-7. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
	Age Group: 16 to <21 years (g/day)							Age Group: 16 to <21 years (g/kg-day)					
Total Foods[a]	922	100.0	1,084	100.0	1,957	100.0	Total Foods[a]	15	100.0	18	100.0	28	100.0
Total Dairy	307	33.3	280	25.8	403	20.6	Total Dairy	4	30.3	4	24.0	5	18.1
Total Meats	12	1.3	115	10.6	385	19.7	Total Meats	0	1.3	2	9.6	5	19.8
Total Fish	20	2.1	9	0.9	12	0.6	Total Fish	0	2.2	0	1.0	0	0.4
Total Eggs	14	1.5	15	1.4	31	1.6	Total Eggs	0	1.4	0	1.9	0	1.6
Total Grains	131	14.2	147	13.6	231	11.8	Total Grains	2	14.5	2	12.8	3	12.3
Total Vegetables	215	23.3	287	26.5	532	27.2	Total Vegetables	4	24.6	5	27.5	8	28.9
Total Fruits	151	16.4	147	13.5	226	11.6	Total Fruits	3	17.8	3	15.7	3	12.4
Total Fats[b]	42	4.5	73	6.7	139	7.1	Total Fats[b]	1	4.6	1	6.2	2	6.5
	Age Group: 20 years and older (g/day)							Age Group: 20 years and older (g/kg-day)					
Total Foods[a]	943	100.0	1,030	100.0	1,560	100.0	Total Foods[a]	14	100.0	15	100.0	21	100.0
Total Dairy	213	22.6	211	20.4	254	16.3	Total Dairy	3	22.6	3	20.7	3	15.9
Total Meats	15	1.6	111	10.8	338	21.7	Total Meats	0	1.6	2	10.3	4	21.3
Total Fish	25	2.6	12	1.2	13	0.8	Total Fish	0	2.6	0	1.3	0	0.9
Total Eggs	17	1.8	21	2.0	33	2.1	Total Eggs	0	1.8	0	2.1	0	2.0
Total Grains	113	12.0	124	12.0	196	12.5	Total Grains	2	11.9	2	12.2	3	12.2
Total Vegetables	259	27.4	282	27.2	446	28.5	Total Vegetables	4	27.3	4	27.6	6	28.2
Total Fruits	234	24.9	192	18.6	165	10.5	Total Fruits	3	25.3	3	18.2	3	12.3
Total Fats[b]	38	4.1	59	5.7	115	7.4	Total Fats[b]	1	4.0	1	5.5	1	7.0

[a] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

[b] Includes added fats such as butter, margarine, dressings and sauces, vegetable oil, etc.; does not include fats eaten as components of other foods such as meats.

[c] All individuals in this sample group consumed 0 g/day of meat. Therefore, results are reported in the low-end decile.

[d] Only one individual in this sample group consumed more than 0 g/day of meat. This result is reported in the high-end decile. All other samples are reported in the low-end decile.

[e] All individuals in this sample group below the 89th percentile consumed 0 g/day of meat. Therefore, only high-end and low-end consumer groups are reported.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 14-8. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat and Dairy Intake

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/day)							Age Group: Birth to <1 month (g/kg-day)						
Total Foods[a]	12	100.0	60	100.0	185	100.0	Total Foods[a]	4	100.0	18	100.0	56	100.0
Total Dairy	0	0.0	40	67.3	127	69.0	Total Dairy	0	0.0	12	67.1	39	69.0
Total Meats	0	0.0	0	0.0	0	0.0	Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0	Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0	Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.3	0	0.0	4	2.2	Total Grains	0	0.2	0	0.0	1	2.1
Total Vegetables	8	66.1	2	3.4	1	0.4	Total Vegetables	2	64.4	1	3.7	0	0.5
Total Fruits	0	0.0	0	0.0	0	0.0	Total Fruits	0	0.0	0	0.0	0	0.0
Total Fats[b]	3	27.1	18	29.2	52	28.4	Total Fats[b]	1	27.5	5	29.2	16	28.4
Age Group: 1 to <3 months (g/day)							Age Group: 1 to <3 months (g/kg-day)						
Total Foods[a]	36	100.0	84	100.0	166	100.0	Total Foods[a]	7	100.0	14	100.0	41	100.0
Total Dairy	0	0.0	19	22.4	109	65.6	Total Dairy	0	0.0	3	24.0	26	64.1
Total Meats	0	0.0	0	0.0	0	0.0	Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0	Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0	Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.9	1	1.2	1	0.8	Total Grains	0	0.8	0	2.0	0	0.6
Total Vegetables	21	58.8	42	50.7	4	2.7	Total Vegetables	4	57.8	7	48.7	0	1.1
Total Fruits	2	4.3	0	0.0	6	3.7	Total Fruits	0	5.4	0	0.0	3	7.7
Total Fats[b]	10	26.7	21	25.4	45	27.2	Total Fats[b]	2	26.4	4	25.0	11	26.5
Age Group: 3 to <6 months (g/day)							Age Group: 3 to <6 months (g/kg-day)						
Total Foods[a]	121	100.0	204	100.0	334	100.0	Total Foods[a]	17	100.0	30	100.0	45	100.0
Total Dairy	0	0.0	60	29.7	159	47.7	Total Dairy	0	0.0	8	26.5	24	53.4
Total Meats	0	0.0	0	0.3	5	1.4	Total Meats	0	0.0	0	0.6	1	1.3
Total Fish	0	0.0	0	0.0	0	0.1	Total Fish	0	0.0	0	0.0	0	0.1
Total Eggs	0	0.0	0	0.1	1	0.2	Total Eggs	0	0.0	0	0.3	0	0.1
Total Grains	5	4.5	7	3.2	12	3.7	Total Grains	1	4.5	1	3.7	2	3.6
Total Vegetables	44	36.4	29	14.5	27	8.0	Total Vegetables	6	37.1	3	11.2	2	5.3
Total Fruits	52	42.9	80	39.0	74	22.3	Total Fruits	7	41.7	14	46.0	8	17.3
Total Fats[b]	15	12.3	27	13.2	54	16.3	Total Fats[b]	2	12.6	3	11.4	8	18.7

Table 14-8. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat and Dairy Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 6 to <12 months (g/day)							Age Group: 6 to <12 months (g/kg-day)						
Total Foods[a]	253	100.0	403	100.0	1,284	100.0	Total Foods[a]	29	100.0	43	100.0	135	100.0
Total Dairy	1	0.5	71	17.6	827	64.5	Total Dairy	0	0.4	8	18.0	87	64.2
Total Meats	1	0.3	17	4.1	45	3.5	Total Meats	0	0.3	2	4.7	5	3.3
Total Fish	0	0.0	1	0.4	0	0.0	Total Fish	0	0.0	0	0.3	0	0.0
Total Eggs	3	1.0	3	0.7	7	0.5	Total Eggs	0	1.1	0	0.9	1	0.5
Total Grains	22	8.5	32	8.0	45	3.5	Total Grains	2	8.0	3	7.1	5	3.5
Total Vegetables	95	37.7	82	20.3	108	8.4	Total Vegetables	11	38.2	9	20.0	12	8.6
Total Fruits	110	43.4	166	41.1	209	16.3	Total Fruits	13	43.4	17	40.4	22	16.6
Total Fats[b]	17	6.7	32	8.0	41	3.2	Total Fats[b]	2	6.7	4	8.3	4	3.2
Age Group: 1 to <2 years (g/day)							Age Group: 1 to <2 years (g/kg-day)						
Total Foods[a]	569	100.0	1,014	100.0	1,687	100.0	Total Foods[a]	51	100.0	82	100.0	155	100.0
Total Dairy	46	8.0	456	45.0	1,165	69.0	Total Dairy	4	7.7	38	45.6	106	68.2
Total Meats	30	5.2	43	4.2	52	3.1	Total Meats	3	5.5	4	5.3	4	2.8
Total Fish	2	0.4	2	0.2	3	0.2	Total Fish	0	0.2	0	0.3	0	0.1
Total Eggs	12	2.0	13	1.3	19	1.1	Total Eggs	1	2.1	1	1.6	1	0.9
Total Grains	54	9.5	64	6.3	65	3.8	Total Grains	5	9.5	6	7.2	6	3.7
Total Vegetables	128	22.5	114	11.3	111	6.6	Total Vegetables	11	22.2	11	13.0	11	6.9
Total Fruits	264	46.4	278	27.4	209	12.4	Total Fruits	24	46.6	19	22.7	21	13.7
Total Fats[b]	25	4.5	36	3.6	59	3.5	Total Fats[b]	2	4.5	3	3.8	5	3.4
Age Group: 2 to <3 years (g/day)							Age Group: 2 to <3 years (g/kg-day)						
Total Foods[a]	641	100.0	981	100.0	1,546	100.0	Total Foods[a]	46	100.0	73	100.0	114	100.0
Total Dairy	57	9.0	348	35.5	883	57.1	Total Dairy	4	8.2	24	32.6	67	58.3
Total Meats	45	6.9	59	6.0	60	3.9	Total Meats	3	7.4	5	6.5	4	3.8
Total Fish	4	0.6	3	0.3	4	0.3	Total Fish	0	0.4	0	0.3	0	0.2
Total Eggs	21	3.2	18	1.9	20	1.3	Total Eggs	1	3.2	1	1.6	2	1.3
Total Grains	75	11.8	86	8.7	86	5.6	Total Grains	5	11.6	6	8.7	7	5.7
Total Vegetables	155	24.1	148	15.1	143	9.2	Total Vegetables	11	23.6	11	14.9	11	9.5
Total Fruits	240	37.5	264	26.9	286	18.5	Total Fruits	18	38.7	22	29.9	19	16.6
Total Fats[b]	32	5.0	42	4.3	55	3.6	Total Fats[b]	2	5.2	3	4.3	4	3.7

Table 14-8. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat and Dairy Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/day)							Age Group: 3 to <6 years (g/kg-day)						
Total Foods[a]	702	100.0	1,043	100.0	1,646	100.0	Total Foods[a]	39	100.0	59	100.0	97	100.0
Total Dairy	75	10.7	352	33.8	878	53.3	Total Dairy	4	10.8	20	33.6	52	53.1
Total Meats	52	7.5	79	7.6	88	5.4	Total Meats	3	7.6	4	7.1	5	5.2
Total Fish	5	0.7	5	0.5	5	0.3	Total Fish	0	0.8	0	0.4	0	0.3
Total Eggs	15	2.2	16	1.5	19	1.2	Total Eggs	1	2.2	1	1.6	1	1.0
Total Grains	85	12.0	107	10.2	121	7.3	Total Grains	5	12.0	6	10.0	7	7.2
Total Vegetables	159	22.6	167	16.0	191	11.6	Total Vegetables	9	22.7	10	16.1	11	11.7
Total Fruits	258	36.7	251	24.1	259	15.8	Total Fruits	14	36.1	15	25.0	16	16.2
Total Fats[b]	35	5.0	51	4.9	67	4.1	Total Fats[b]	2	5.1	3	4.7	4	4.1
Age Group: 6 to <11 years (g/day)							Age Group: 6 to <11 years (g/kg-day)						
Total Foods[a]	725	100.0	1,061	100.0	1,727	100.0	Total Foods[a]	21	100.0	38	100.0	68	100.0
Total Dairy	76	10.5	366	34.5	883	51.1	Total Dairy	2	11.6	13	34.8	35	51.0
Total Meats	66	9.2	91	8.6	105	6.1	Total Meats	2	9.9	3	8.2	4	5.9
Total Fish	6	0.8	7	0.7	6	0.3	Total Fish	0	0.8	0	0.6	0	0.4
Total Eggs	16	2.3	17	1.6	18	1.1	Total Eggs	1	2.4	1	1.4	1	1.0
Total Grains	101	13.9	116	10.9	151	8.7	Total Grains	3	14.1	4	10.9	6	9.2
Total Vegetables	202	27.9	205	19.4	245	14.2	Total Vegetables	6	27.0	7	18.7	10	14.1
Total Fruits	198	27.3	178	16.7	221	12.8	Total Fruits	6	25.9	7	17.8	8	12.4
Total Fats[b]	43	6.0	56	5.3	73	4.2	Total Fats[b]	1	6.2	2	5.4	3	4.4
Age Group: 11 to <16 years (g/day)							Age Group: 11 to <16 years (g/kg-day)						
Total Foods[a]	727	100.0	1,111	100.0	2,045	100.0	Total Foods[a]	12	100.0	23	100.0	43	100.0
Total Dairy	38	5.2	299	26.9	1,004	49.1	Total Dairy	1	4.9	6	26.0	21	47.9
Total Meats	58	8.0	118	10.6	161	7.9	Total Meats	1	9.3	2	10.9	3	7.5
Total Fish	10	1.4	11	1.0	12	0.6	Total Fish	0	1.3	0	0.6	0	0.8
Total Eggs	16	2.2	22	2.0	26	1.3	Total Eggs	0	2.5	0	1.5	1	1.2
Total Grains	103	14.2	137	12.4	181	8.9	Total Grains	2	14.2	3	11.5	4	9.1
Total Vegetables	234	32.2	265	23.9	332	16.2	Total Vegetables	4	32.4	6	24.5	7	15.5
Total Fruits	213	29.3	176	15.8	204	10.0	Total Fruits	3	27.0	4	17.1	5	11.8
Total Fats[b]	42	5.8	66	6.0	104	5.1	Total Fats[b]	1	6.3	1	6.1	2	4.9

Table 14-8. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Meat and Dairy Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
	Age Group: 16 to <21 years (g/day)							Age Group: 16 to <21 years (g/kg-day)					
Total Foods[a]	610	100.0	1,017	100.0	2,379	100.0	Total Foods[a]	9	100.0	15	100.0	34	100.0
Total Dairy	22	3.5	204	20.1	923	38.8	Total Dairy	0	3.8	3	19.1	13	39.1
Total Meats	42	6.8	128	12.6	256	10.8	Total Meats	1	6.8	2	13.4	4	10.8
Total Fish	12	1.9	12	1.2	8	0.3	Total Fish	0	1.8	0	0.9	0	0.3
Total Eggs	13	2.2	19	1.8	28	1.2	Total Eggs	0	2.0	0	1.8	0	1.1
Total Grains	87	14.3	140	13.8	233	9.8	Total Grains	1	14.6	2	14.3	3	10.1
Total Vegetables	202	33.1	305	29.9	492	20.7	Total Vegetables	3	34.0	5	30.4	7	20.8
Total Fruits	177	29.1	133	13.1	282	11.9	Total Fruits	3	28.1	2	12.2	4	11.2
Total Fats[b]	34	5.6	68	6.6	127	5.3	Total Fats[b]	1	5.5	1	6.8	2	5.4
	Age Group: 20 years and older (g/day)							Age Group: 20 years and older (g/kg-day)					
Total Foods[a]	679	100.0	1,050	100.0	1,860	100.0	Total Foods[a]	9	100.0	14	100.0	26	100.0
Total Dairy	28	4.1	157	14.9	696	37.5	Total Dairy	0	3.9	2	15.2	10	37.6
Total Meats	45	6.6	136	12.9	208	11.2	Total Meats	1	6.8	2	12.7	3	10.4
Total Fish	21	3.1	14	1.3	17	0.9	Total Fish	0	3.1	0	1.4	0	1.0
Total Eggs	19	2.8	22	2.1	29	1.5	Total Eggs	0	2.8	0	2.1	0	1.5
Total Grains	99	14.6	131	12.5	185	10.0	Total Grains	1	14.5	2	12.9	3	9.8
Total Vegetables	236	34.7	319	30.3	385	20.7	Total Vegetables	3	35.0	4	29.9	5	20.3
Total Fruits	179	26.3	190	18.1	215	11.6	Total Fruits	2	26.1	3	18.1	3	13.1
Total Fats[b]	34	5.0	65	6.1	100	5.4	Total Fats[b]	0	5.1	1	6.0	1	5.1

[a] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

[b] Includes added fats such as butter, margarine, dressings and sauces, vegetable oil, etc.; does not include fats eaten as components of other foods such as meats.

Source: U.S. EPA analysis of 1994−1996, 1998 CSFII.

Table 14-9. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fish Intake

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/day)[a]							Age Group: Birth to <1 month (g/kg-day)[a]						
Total Foods[b]	67	100.0	-	-	-	-	Total Foods[b]	20	100.0	-	-	-	-
Total Dairy	41	61.5	-	-	-	-	Total Dairy	12	61.6	-	-	-	-
Total Meats	0	0.0	-	-	-	-	Total Meats	0	0.0	-	-	-	-
Total Fish	0	0.0	-	-	-	-	Total Fish	0	0.0	-	-	-	-
Total Eggs	0	0.0	-	-	-	-	Total Eggs	0	0.0	-	-	-	-
Total Grains	0	0.7	-	-	-	-	Total Grains	0	0.7	-	-	-	-
Total Vegetables	5	7.7	-	-	-	-	Total Vegetables	2	7.7	-	-	-	-
Total Fruits	1	1.3	-	-	-	-	Total Fruits	0	1.1	-	-	-	-
Total Fats[c]	19	28.3	-	-	-	-	Total Fats[c]	6	28.4	-	-	-	-
Age Group: 1 to <3 months (g/day)[a]							Age Group: 1 to <3 months (g/kg-day)[a]						
Total Foods[b]	80	100.0	-	-	-	-	Total Foods[b]	16	100.0	-	-	-	-
Total Dairy	37	46.5	-	-	-	-	Total Dairy	8	48.2	-	-	-	-
Total Meats	0	0.0	-	-	-	-	Total Meats	0	0.0	-	-	-	-
Total Fish	0	0.0	-	-	-	-	Total Fish	0	0.0	-	-	-	-
Total Eggs	0	0.0	-	-	-	-	Total Eggs	0	0.0	-	-	-	-
Total Grains	1	1.5	-	-	-	-	Total Grains	0	1.4	-	-	-	-
Total Vegetables	15	18.5	-	-	-	-	Total Vegetables	3	16.6	-	-	-	-
Total Fruits	4	5.2	-	-	-	-	Total Fruits	1	5.5	-	-	-	-
Total Fats[c]	21	26.4	-	-	-	-	Total Fats[c]	4	26.5	-	-	-	-
Age Group: 3 to <6 months (g/day)[d]							Age Group: 3 to <6 months (g/kg-day)[d]						
Total Foods[b]	196	100.0	-	-	410	100.0	Total Foods[b]	28	100.0	-	-	53	100.0
Total Dairy	55	28.3	-	-	159	38.8	Total Dairy	8	28.9	-	-	21	38.8
Total Meats	2	0.8	-	-	28	6.8	Total Meats	0	0.7	-	-	4	6.8
Total Fish	0	0.0	-	-	17	4.1	Total Fish	0	0.0	-	-	2	4.1
Total Eggs	0	0.1	-	-	4	1.0	Total Eggs	0	0.1	-	-	1	1.0
Total Grains	8	3.9	-	-	47	11.5	Total Grains	1	3.8	-	-	6	11.5
Total Vegetables	34	17.2	-	-	34	8.3	Total Vegetables	5	17.1	-	-	4	8.3
Total Fruits	68	34.7	-	-	30	7.2	Total Fruits	9	33.9	-	-	4	7.2
Total Fats[c]	28	14.1	-	-	81	19.8	Total Fats[c]	4	14.5	-	-	11	19.8

Table 14-9. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fish Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 6 to <12 months (g/day)[e]							Age Group: 6 to <12 months (g/kg-day)[e]						
Total Foods[b]	799	100.0	-	-	770	100.0	Total Foods[b]	81	100.0	-	-	74	100.0
Total Dairy	334	41.8	-	-	287	37.3	Total Dairy	34	41.8	-	-	27	37.1
Total Meats	38	4.7	-	-	46	6.0	Total Meats	4	4.7	-	-	4	6.0
Total Fish	0	0.0	-	-	7	0.9	Total Fish	0	0.0	-	-	1	0.9
Total Eggs	11	1.4	-	-	14	1.9	Total Eggs	1	1.4	-	-	1	2.0
Total Grains	47	5.9	-	-	66	8.6	Total Grains	5	5.9	-	-	6	8.4
Total Vegetables	101	12.6	-	-	117	15.3	Total Vegetables	10	12.6	-	-	12	15.6
Total Fruits	227	28.4	-	-	194	25.2	Total Fruits	23	28.4	-	-	19	25.2
Total Fats[c]	37	4.7	-	-	36	4.7	Total Fats[c]	4	4.7	-	-	3	4.7
Age Group: 1 to <2 years (g/day)[e]							Age Group: 1 to <2 years (g/kg-day)[e]						
Total Foods[b]	1,032	100.0	-	-	1,139	100.0	Total Foods[b]	90	100.0	-	-	98	100.0
Total Dairy	496	48.1	-	-	461	40.5	Total Dairy	43	48.2	-	-	41	42.4
Total Meats	46	4.5	-	-	56	4.9	Total Meats	4	4.4	-	-	5	4.8
Total Fish	0	0.0	-	-	26	2.3	Total Fish	0	0.0	-	-	2	2.2
Total Eggs	14	1.4	-	-	19	1.7	Total Eggs	1	1.3	-	-	2	1.6
Total Grains	65	6.3	-	-	76	6.7	Total Grains	6	6.2	-	-	7	6.7
Total Vegetables	118	11.4	-	-	151	13.2	Total Vegetables	10	11.4	-	-	12	12.3
Total Fruits	247	24.0	-	-	300	26.3	Total Fruits	22	24.0	-	-	25	25.5
Total Fats[c]	39	3.8	-	-	43	3.8	Total Fats[c]	3	3.8	-	-	4	3.8
Age Group: 2 to <3 years (g/day)[e]							Age Group: 2 to <3 years (g/kg-day)[e]						
Total Foods[b]	1,015	100.0	-	-	1,107	100.0	Total Foods[b]	73	100.0	-	-	82	100.0
Total Dairy	381	37.6	-	-	424	38.3	Total Dairy	28	37.9	-	-	31	37.6
Total Meats	62	6.1	-	-	53	4.8	Total Meats	4	6.0	-	-	4	4.6
Total Fish	0	0.0	-	-	31	2.8	Total Fish	0	0.0	-	-	2	2.9
Total Eggs	18	1.8	-	-	17	1.6	Total Eggs	1	1.7	-	-	1	1.5
Total Grains	81	7.9	-	-	84	7.6	Total Grains	6	7.9	-	-	6	7.5
Total Vegetables	144	14.2	-	-	142	12.8	Total Vegetables	10	14.1	-	-	10	12.7
Total Fruits	276	27.2	-	-	304	27.4	Total Fruits	20	27.0	-	-	23	28.5
Total Fats[c]	42	4.2	-	-	43	3.9	Total Fats[c]	3	4.2	-	-	3	3.9

Table 14-9. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fish Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/day)[e]							Age Group: 3 to <6 years (g/kg-day)[e]						
Total Foods[b]	1,053	100.0	-	-	1,156	100.0	Total Foods[b]	60	100.0	-	-	66	100.0
Total Dairy	390	37.1	-	-	399	34.5	Total Dairy	22	37.1	-	-	22	33.9
Total Meats	76	7.2	-	-	62	5.3	Total Meats	4	7.1	-	-	3	5.3
Total Fish	0	0.0	-	-	43	3.7	Total Fish	0	0.0	-	-	2	3.7
Total Eggs	16	1.5	-	-	17	1.4	Total Eggs	1	1.5	-	-	1	1.6
Total Grains	101	9.6	-	-	103	8.9	Total Grains	6	9.5	-	-	6	9.0
Total Vegetables	168	15.9	-	-	193	16.7	Total Vegetables	9	15.8	-	-	11	16.9
Total Fruits	237	22.5	-	-	273	23.6	Total Fruits	14	22.7	-	-	16	23.8
Total Fats[c]	50	4.8	-	-	50	4.3	Total Fats[c]	3	4.7	-	-	3	4.3
Age Group: 6 to <11 years (g/day)[e]							Age Group: 6 to <11 years (g/kg-day)[e]						
Total Foods[b]	1,109	100.0	-	-	1,234	100.0	Total Foods[b]	40	100.0	-	-	44	100.0
Total Dairy	408	36.8	-	-	430	34.8	Total Dairy	15	37.0	-	-	16	35.6
Total Meats	89	8.0	-	-	76	6.2	Total Meats	3	7.9	-	-	3	6.1
Total Fish	0	0.0	-	-	51	4.1	Total Fish	0	0.0	-	-	2	4.1
Total Eggs	15	1.3	-	-	22	1.8	Total Eggs	1	1.3	-	-	1	1.6
Total Grains	119	10.7	-	-	126	10.2	Total Grains	4	10.7	-	-	4	10.1
Total Vegetables	208	18.8	-	-	233	18.9	Total Vegetables	7	18.5	-	-	8	18.4
Total Fruits	190	17.1	-	-	218	17.7	Total Fruits	7	17.3	-	-	8	17.5
Total Fats[c]	58	5.2	-	-	61	4.9	Total Fats[c]	2	5.2	-	-	2	4.9

Table 14-9. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fish Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
	Age Group: 11 to <16 years (g/day)[e]							Age Group: 11 to <16 years (g/kg-day)[e]					
Total Foods[b]	1,197	100.0	-	-	1,378	100.0	Total Foods[b]	24	100.0	-	-	28	100.0
Total Dairy	372	31.1	-	-	397	28.8	Total Dairy	7	31.1	-	-	9	30.9
Total Meats	117	9.8	-	-	104	7.5	Total Meats	2	9.7	-	-	2	6.9
Total Fish	0	0.0	-	-	72	5.2	Total Fish	0	0.0	-	-	1	4.9
Total Eggs	17	1.4	-	-	28	2.0	Total Eggs	0	1.4	-	-	1	1.9
Total Grains	135	11.3	-	-	146	10.6	Total Grains	3	11.3	-	-	3	10.5
Total Vegetables	277	23.1	-	-	310	22.5	Total Vegetables	5	22.9	-	-	6	21.1
Total Fruits	190	15.8	-	-	226	16.4	Total Fruits	4	16.2	-	-	5	17.1
Total Fats[c]	69	5.8	-	-	76	5.5	Total Fats[c]	1	5.7	-	-	1	5.2
	Age Group: 16 to <21 years (g/day)[e]							Age Group: 16 to <21 years (g/kg-day)[e]					
Total Foods[b]	1,171	100.0	-	-	1,339	100.0	Total Foods[b]	18	100.0	-	-	19	100.0
Total Dairy	288	24.6	-	-	261	19.5	Total Dairy	4	24.5	-	-	4	20.3
Total Meats	143	12.2	-	-	139	10.4	Total Meats	2	11.9	-	-	2	9.4
Total Fish	0	0.0	-	-	86	6.5	Total Fish	0	0.0	-	-	1	6.7
Total Eggs	20	1.7	-	-	21	1.6	Total Eggs	0	1.7	-	-	0	1.6
Total Grains	146	12.5	-	-	162	12.1	Total Grains	2	12.5	-	-	2	12.0
Total Vegetables	325	27.8	-	-	357	26.6	Total Vegetables	5	27.9	-	-	5	26.0
Total Fruits	160	13.7	-	-	219	16.3	Total Fruits	2	13.9	-	-	3	16.9
Total Fats[c]	75	6.4	-	-	80	6.0	Total Fats[c]	1	6.4	-	-	1	5.9

Table 14-9. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fish Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
	Age Group: 20 years and older (g/day)							Age Group: 20 years and older (g/kg-day)					
Total Foods[b]	1,040	100.0	1,060	100.0	1,340	100.0	Total Foods[b]	14	100.0	15	100.0	19	100.0
Total Dairy	207	20.0	205	19.3	250	18.7	Total Dairy	3	20.2	3	19.1	4	19.0
Total Meats	126	12.1	143	13.4	121	9.1	Total Meats	2	11.9	2	12.7	2	8.5
Total Fish	0	0.0	0	0.0	102	7.7	Total Fish	0	0.0	0	0.0	1	7.6
Total Eggs	22	2.1	24	2.2	27	2.0	Total Eggs	0	2.0	0	2.0	0	1.9
Total Grains	134	12.9	133	12.5	152	11.4	Total Grains	2	13.0	2	12.3	2	11.2
Total Vegetables	303	29.2	300	28.3	348	26.0	Total Vegetables	4	29.1	4	28.3	5	26.0
Total Fruits	165	15.9	180	16.9	238	17.8	Total Fruits	2	16.1	3	18.2	4	18.7
Total Fats[c]	62	6.0	64	6.0	74	5.5	Total Fats[c]	1	5.9	1	5.8	1	5.2

[a] All individuals in this sample group consumed 0 g/day of fish. Therefore, only low-end consumers are reported.

[b] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

[c] Includes added fats such as butter, margarine, dressings and sauces, vegetable oil, etc.; does not include fats eaten as components of other foods such as meats.

[d] Only one individual in this sample group consumed more than 0 g/day of fish. Therefore, this sample is reported in the high-end consumer group and all other samples are placed in the low-end consumer group.

[e] All individuals in this sample group below the 80th percentile consumed 0 g/day of fish. Therefore, only high-end and low-end consumer groups are reported.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 14-10. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fruit and Vegetable Intake

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/day)[a]							Age Group: Birth to <1 month (g/kg-day)[a]						
Total Foods[b]	49	100.0	-	-	101	100.0	Total Foods[b]	14	100.0	-	-	29	100.0
Total Dairy	34	69.7	-	-	21	21.1	Total Dairy	10	69.6	-	-	6	19.4
Total Meats	0	0.0	-	-	0	0.0	Total Meats	0	0.0	-	-	0	0.0
Total Fish	0	0.0	-	-	0	0.0	Total Fish	0	0.0	-	-	0	0.0
Total Eggs	0	0.0	-	-	0	0.0	Total Eggs	0	0.0	-	-	0	0.0
Total Grains	1	1.2	-	-	0.21	0.2	Total Grains	0	1.3	-	-	0	0.2
Total Vegetables	0	0.0	-	-	44	43.3	Total Vegetables	0	0.0	-	-	13	44.8
Total Fruits	0	0.0	-	-	8	7.6	Total Fruits	0	0.0	-	-	2	6.4
Total Fats[c]	14	29.1	-	-	25	24.8	Total Fats[c]	4	29.1	-	-	7	25.4
Age Group: 1 to <3 months (g/day)[a]							Age Group: 1 to <3 months (g/kg-day)[a]						
Total Foods[b]	49	100.0	-	-	171	100.0	Total Foods[b]	11	100.0	-	-	35	100.0
Total Dairy	34	69.2	-	-	16	9.5	Total Dairy	7	69.4	-	-	4	11.5
Total Meats	0	0.0	-	-	0	0.0	Total Meats	0	0.0	-	-	0	0.0
Total Fish	0	0.0	-	-	0	0.0	Total Fish	0	0.0	-	-	0	0.0
Total Eggs	0	0.0	-	-	0	0.0	Total Eggs	0	0.0	-	-	0	0.0
Total Grains	1	1.9	-	-	2	1.0	Total Grains	0	1.7	-	-	0	1.1
Total Vegetables	0	0.0	-	-	89	52.0	Total Vegetables	0	0.0	-	-	16	46.8
Total Fruits	0	0.0	-	-	18	10.2	Total Fruits	0	0.0	-	-	5	13.9
Total Fats[c]	14	28.9	-	-	40	23.4	Total Fats[c]	3	29.0	-	-	8	22.7
Age Group: 3 to <6 months (g/day)							Age Group: 3 to <6 months (g/kg-day)						
Total Foods[b]	69	100.0	144	100.0	495	100.0	Total Foods[b]	11	100.0	21	100.0	70	100.0
Total Dairy	47	68.0	51	35.6	49	9.9	Total Dairy	7	68.1	8	37.2	7	10.1
Total Meats	0	0.0	2	1.3	4	0.8	Total Meats	0	0.0	0	1.5	1	0.7
Total Fish	0	0.0	0	0.3	0	0.0	Total Fish	0	0.0	0	0.3	0	0.0
Total Eggs	0	0.0	1	0.4	0	0.0	Total Eggs	0	0.0	0	0.5	0	0.0
Total Grains	2	3.3	10	6.7	12	2.4	Total Grains	0	3.2	1	6.6	2	2.6
Total Vegetables	0	0.0	24	16.6	88	17.7	Total Vegetables	0	0.0	3	15.1	12	17.7
Total Fruits	0	0.0	29	19.9	311	62.8	Total Fruits	0	0.0	4	20.8	44	62.4
Total Fats[c]	20	28.4	25	17.7	27	5.4	Total Fats[c]	3	28.5	4	16.9	4	5.5

Table 14-10. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fruit and Vegetable Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 6 to <12 months (g/day)							Age Group: 6 to <12 months (g/kg-day)						
Total Foods[b]	189	100.0	461	100.0	951	100.0	Total Foods[b]	21	100.0	57	100.0	100	100.0
Total Dairy	91	48.3	129	28.0	207	21.8	Total Dairy	10	48.1	19	33.2	18	17.9
Total Meats	8	4.0	17	3.6	37	3.9	Total Meats	1	3.6	2	4.3	4	3.8
Total Fish	1	0.4	1	0.2	0	0.0	Total Fish	0	0.4	0	0.1	0	0.0
Total Eggs	4	1.9	9	1.9	8	0.8	Total Eggs	0	1.7	1	1.0	1	0.7
Total Grains	23	12.1	31	6.8	41	4.3	Total Grains	2	11.4	4	6.5	5	4.6
Total Vegetables	18	9.4	83	18.1	160	16.8	Total Vegetables	2	9.3	10	16.9	19	19.0
Total Fruits	15	7.7	158	34.3	459	48.2	Total Fruits	2	8.4	18	30.8	50	49.5
Total Fats[c]	31	16.3	31	6.8	35	3.6	Total Fats[c]	3	16.8	4	6.6	4	3.9
Age Group: 1 to <2 years (g/day)							Age Group: 1 to <2 years (g/kg-day)						
Total Foods[b]	796	100.0	1,048	100.0	1,499	100.0	Total Foods[b]	68	100.0	88	100.0	133	100.0
Total Dairy	578	72.7	535	51.0	425	28.4	Total Dairy	49	71.8	44	49.6	39	29.5
Total Meats	35	4.5	46	4.4	62	4.2	Total Meats	3	4.7	4	4.5	5	3.6
Total Fish	1	0.1	3	0.3	5	0.4	Total Fish	0	0.2	0	0.3	0	0.2
Total Eggs	8	1.0	16	1.5	17	1.1	Total Eggs	1	1.1	1	1.2	2	1.2
Total Grains	49	6.2	65	6.2	77	5.1	Total Grains	4	6.2	6	6.9	7	5.2
Total Vegetables	56	7.1	123	11.7	179	11.9	Total Vegetables	5	7.1	11	12.6	15	11.6
Total Fruits	26	3.2	210	20.1	687	45.8	Total Fruits	2	3.4	18	20.5	60	45.4
Total Fats[c]	36	4.6	41	3.9	39	2.6	Total Fats[c]	3	4.7	3	3.7	4	2.7
Age Group: 2 to <3 years (g/day)							Age Group: 2 to <3 years (g/kg-day)						
Total Foods[b]	601	100.0	942	100.0	1,589	100.0	Total Foods[b]	43	100.0	69	100.0	114	100.0
Total Dairy	308	51.2	352	37.4	384	24.1	Total Dairy	22	51.3	27	39.3	27	23.6
Total Meats	53	8.8	59	6.3	64	4.0	Total Meats	4	8.8	4	6.0	4	3.8
Total Fish	2	0.3	4	0.5	5	0.3	Total Fish	0	0.3	0	0.4	0	0.4
Total Eggs	14	2.3	18	2.0	20	1.3	Total Eggs	1	2.3	1	1.9	2	1.4
Total Grains	72	12.0	80	8.5	91	5.7	Total Grains	5	12.0	6	8.6	7	5.7
Total Vegetables	81	13.4	141	15.0	202	12.7	Total Vegetables	6	13.8	10	14.0	14	12.4
Total Fruits	24	4.0	237	25.1	765	48.1	Total Fruits	2	3.7	17	24.6	56	49.1
Total Fats[c]	38	6.3	40	4.2	46	2.9	Total Fats[c]	3	6.3	3	4.1	3	2.9

Table 14-10. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fruit and Vegetable Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/day)							Age Group: 3 to <6 years (g/kg-day)						
Total Foods[b]	731	100.0	1,014	100.0	1,594	100.0	Total Foods[b]	40	100.0	58	100.0	95	100.0
Total Dairy	388	53.1	385	38.0	401	25.1	Total Dairy	21	52.7	22	38.2	25	25.8
Total Meats	60	8.2	74	7.3	81	5.1	Total Meats	3	8.6	4	7.0	5	4.8
Total Fish	4	0.5	7	0.7	9	0.6	Total Fish	0	0.4	0	0.6	0	0.5
Total Eggs	13	1.7	14	1.4	21	1.3	Total Eggs	1	1.6	1	1.4	1	1.1
Total Grains	92	12.5	96	9.4	113	7.1	Total Grains	5	12.4	6	10.3	7	6.8
Total Vegetables	92	12.5	174	17.1	231	14.5	Total Vegetables	5	13.0	10	16.5	13	13.9
Total Fruits	27	3.6	199	19.6	668	41.9	Total Fruits	1	3.4	11	19.5	41	42.5
Total Fats[c]	45	6.1	49	4.9	53	3.3	Total Fats[c]	2	6.1	3	4.9	3	3.3
Age Group: 6 to <11 years (g/day)							Age Group: 6 to <11 years (g/kg-day)						
Total Foods[b]	784	100.0	1,068	100.0	1,664	100.0	Total Foods[b]	23	100.0	38	100.0	64	100.0
Total Dairy	385	49.2	406	38.0	448	26.9	Total Dairy	11	47.0	14	37.6	18	27.5
Total Meats	76	9.7	88	8.3	98	5.9	Total Meats	2	10.1	3	8.9	4	5.7
Total Fish	5	0.6	6	0.6	8	0.5	Total Fish	0	0.8	0	0.4	0	0.5
Total Eggs	16	2.1	16	1.5	17	10.	Total Eggs	1	2.3	1	1.5	1	1.2
Total Grains	105	13.3	117	11.0	127	7.6	Total Grains	3	13.8	5	11.8	5	8.1
Total Vegetables	103	13.2	213	19.9	313	18.8	Total Vegetables	3	13.8	7	19.1	11	17.7
Total Fruits	26	3.4	144	13.5	559	33.6	Total Fruits	1	3.6	5	13.3	22	33.6
Total Fats[c]	48	6.2	59	5.5	64	3.9	Total Fats[c]	1	6.4	2	5.4	3	3.9
Age Group: 11 to <16 years (g/day)							Age Group: 11 to <16 years (g/kg-day)						
Total Foods[b]	709	100.0	1,149	100.0	1,911	100.0	Total Foods[b]	12	100.0	23	100.0	39	100.0
Total Dairy	301	42.4	362	31.5	395	20.7	Total Dairy	5	42.0	8	33.1	9	22.3
Total Meats	91	12.8	112	9.7	146	7.7	Total Meats	1	12.4	2	9.8	3	6.4
Total Fish	3	0.4	10	0.8	14	0.7	Total Fish	0	0.5	0	0.5	0	0.5
Total Eggs	13	1.8	20	1.7	24	1.3	Total Eggs	0	1.9	0	1.7	1	1.5
Total Grains	106	15.0	136	11.8	165	8.6	Total Grains	2	14.8	3	12.1	3	8.8
Total Vegetables	125	17.7	286	24.9	458	24.0	Total Vegetables	2	18.2	5	23.0	9	22.4
Total Fruits	13	1.9	136	11.8	597	31.2	Total Fruits	0	2.2	3	12.3	13	32.3
Total Fats[c]	49	6.9	66	5.8	87	4.5	Total Fats[c]	1	7.0	1	5.9	2	4.2

Table 14-10. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Fruit and Vegetable Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 16 to <21 years (g/day)							Age Group: 16 to <21 years (g/kg-day)						
Total Foods[b]	624	100.0	970	100.0	2,353	100.0	Total Foods[b]	9	100.0	16	100.0	34	100.0
Total Dairy	238	38.1	203	21.0	449	19.1	Total Dairy	4	39.0	3	21.0	6	17.8
Total Meats	76	12.2	112	11.5	245	10.4	Total Meats	1	11.7	2	12.7	3	9.6
Total Fish	8	1.2	15	1.6	17	0.7	Total Fish	0	1.4	0	0.8	0	0.6
Total Eggs	21	3.3	16	1.6	30	1.3	Total Eggs	0	3.4	0	2.5	0	1.0
Total Grains	100	16.1	138	14.2	211	9.0	Total Grains	1	16.2	2	14.6	3	10.0
Total Vegetables	109	17.5	283	29.2	615	26.1	Total Vegetables	2	17.9	5	30.7	9	25.8
Total Fruits	18	2.9	121	12.5	644	27.4	Total Fruits	0	1.8	1	9.1	10	30.0
Total Fats[c]	46	7.3	66	6.8	116	4.9	Total Fats[c]	1	7.2	1	7.5	2	4.4
Age Group: 20 years and older (g/day)							Age Group: 20 years and older (g/kg-day)						
Total Foods[b]	602	100.0	1,040	100.0	1,920	100.0	Total Foods[b]	8	100.0	14	100.0	27	100.0
Total Dairy	178	29.6	215	20.6	282	14.7	Total Dairy	2	28.6	3	20.3	4	14.7
Total Meats	99	16.4	129	12.4	168	8.7	Total Meats	1	16.9	2	13.0	2	7.5
Total Fish	11	1.8	15	1.4	23	1.2	Total Fish	0	1.8	0	1.2	0	1.3
Total Eggs	21	3.5	23	2.2	28	1.5	Total Eggs	0	3.4	0	2.1	0	1.3
Total Grains	105	17.5	131	12.6	177	9.2	Total Grains	1	17.8	2	13.2	2	9.0
Total Vegetables	115	19.1	306	29.4	527	27.4	Total Vegetables	2	19.6	4	29.7	7	27.2
Total Fruits	16	2.6	138	13.3	610	31.7	Total Fruits	0	2.5	2	12.5	9	33.9
Total Fats[c]	45	7.5	64	6.2	83	4.3	Total Fats[c]	1	7.7	1	6.3	1	3.8

[a] All individuals in this sample group below the 75th percentile consumed 0 g/day of fruits and vegetables. Therefore, only high-end and low-end consumer groups are reported.

[b] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

[c] Includes added fats such as butter, margarine, dressings and sauces, vegetable oil, etc.; does not include fats eaten as components of other foods such as meats.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 14-11. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Dairy Intake

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: Birth to <1 month (g/day)							Age Group: Birth to <1 month (g/kg-day)						
Total Foods[a]	12	100.0	60	100.0	185	100.0	Total Foods[a]	4	100.0	18	100.0	56	100.0
Total Dairy	0	0.0	40	67.3	127	69.0	Total Dairy	0	0.0	12	67.1	39	69.0
Total Meats	0	0.0	0	0.0	0	0.0	Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0	Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0	Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.3	0	0.0	4	2.2	Total Grains	0	0.2	0	0.0	1	2.1
Total Vegetables	8	66.1	2	3.4	1	0.4	Total Vegetables	2	64.4	1	3.7	0	0.5
Total Fruits	0	0.0	0	0.0	0	0.0	Total Fruits	0	0.0	0	0.0	0	0.0
Total Fats[b]	3	27.1	18	29.2	52	28.4	Total Fats[b]	1	27.5	5	29.2	16	28.4
Age Group: 1 to <3 months (g/day)							Age Group: 1 to <3 months (g/kg-day)						
Total Foods[a]	36	100.0	84	100.0	166	100.0	Total Foods[a]	7	100.0	14	100.0	41	100.0
Total Dairy	0	0.0	19	22.4	109	65.6	Total Dairy	0	0.0	3	24.0	26	64.1
Total Meats	0	0.0	0	0.0	0	0.0	Total Meats	0	0.0	0	0.0	0	0.0
Total Fish	0	0.0	0	0.0	0	0.0	Total Fish	0	0.0	0	0.0	0	0.0
Total Eggs	0	0.0	0	0.0	0	0.0	Total Eggs	0	0.0	0	0.0	0	0.0
Total Grains	0	0.9	1	1.2	0	0.8	Total Grains	0	0.8	0	2.0	0	0.6
Total Vegetables	21	58.8	42	50.7	4	2.7	Total Vegetables	4	57.8	7	48.7	0	1.1
Total Fruits	2	4.3	0	0.0	6	3.7	Total Fruits	0	5.4	0	0.0	3	7.7
Total Fats[b]	10	26.7	21	25.4	45	27.2	Total Fats[b]	2	26.4	4	25.0	11	26.5
Age Group: 3 to <6 months (g/day)							Age Group: 3 to <6 months (g/kg-day)						
Total Foods[a]	132	100.0	217	100.0	346	100.0	Total Foods[a]	19	100.0	32	100.0	44	100.0
Total Dairy	0	0.0	59	27.0	160	46.3	Total Dairy	0	0.0	8	24.8	24	54.9
Total Meats	1	0.4	2	1.0	4	1.1	Total Meats	0	0.5	0	0.7	0	1.0
Total Fish	0	0.0	0	0.0	0	0.1	Total Fish	0	0.0	0	0.0	0	0.1
Total Eggs	0	0.0	0	0.2	1	0.2	Total Eggs	0	0.0	0	0.3	0	0.1
Total Grains	6	4.5	8	3.8	12	3.4	Total Grains	1	4.5	1	3.8	2	3.4
Total Vegetables	46	34.9	37	17.0	26	7.6	Total Vegetables	7	35.6	4	13.7	2	5.0
Total Fruits	58	44.1	84	38.8	87	25.1	Total Fruits	8	43.0	14	45.8	7	15.9
Total Fats[b]	16	11.9	26	12.1	55	15.8	Total Fats[b]	2	12.2	3	10.7	8	19.2

Table 14-11. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Dairy Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
Age Group: 6 to <12 months (g/day)							Age Group: 6 to <12 months (g/kg-day)						
Total Foods[a]	317	100.0	368	100.0	1,285	100.0	Total Foods[a]	36	100.0	43	100.0	135	100.0
Total Dairy	0	0.0	71	19.2	833	64.8	Total Dairy	0	0.0	8	18.2	87	64.8
Total Meats	11	3.4	16	4.4	41	3.2	Total Meats	1	3.5	2	4.8	4	3.0
Total Fish	0	0.0	1	0.3	0	0.0	Total Fish	0	0.0	0	0.3	0	0.0
Total Eggs	3	0.9	5	1.4	6	0.5	Total Eggs	0	1.0	1	2.1	1	0.5
Total Grains	27	8.6	23	6.3	46	3.6	Total Grains	3	7.9	3	7.7	5	3.5
Total Vegetables	114	35.9	75	20.4	106	8.2	Total Vegetables	13	35.3	8	17.9	11	8.2
Total Fruits	137	43.3	147	39.9	211	16.4	Total Fruits	16	44.6	18	40.7	22	16.6
Total Fats[b]	20	6.4	30	8.2	40	3.1	Total Fats[b]	2	6.3	4	8.1	4	3.1
Age Group: 1 to <2 years (g/day)							Age Group: 1 to <2 years (g/kg-day)						
Total Foods[a]	601	100.0	989	100.0	1,700	100.0	Total Foods[a]	55	100.0	86	100.0	154	100.0
Total Dairy	40	6.7	451	45.6	1,170	68.8	Total Foods[a]	3	6.1	38	44.0	106	68.5
Total Meats	43	7.1	51	5.2	45	2.6	Total Dairy	4	7.2	4	4.8	4	2.6
Total Fish	3	0.5	4	0.4	3	0.2	Total Meats	0	0.5	1	0.6	0	0.1
Total Eggs	14	2.3	15	1.5	18	1.1	Total Fish	1	2.3	2	1.8	1	0.8
Total Grains	57	9.5	65	6.5	63	3.7	Total Eggs	5	9.5	6	6.9	6	3.7
Total Vegetables	139	23.1	120	12.1	112	6.6	Total Grains	12	21.8	11	13.0	10	6.7
Total Fruits	268	44.7	240	24.3	226	13.3	Total Vegetables	25	46.3	21	24.5	21	13.8
Total Fats[b]	29	4.8	38	3.8	58	3.4	Total Fruits	3	4.7	3	3.7	5	3.4
Age Group: 2 to <3 years (g/day)							Age Group: 2 to <3 years (g/kg-day)						
Total Foods[a]	661	100.0	996	100.0	1,528	100.0	Total Foods[a]	47	100.0	72	100.0	114	100.0
Total Dairy	48	7.3	348	34.9	885	57.9	Total Dairy	3	7.2	24	33.7	67	58.4
Total Meats	61	9.3	63	6.3	55	3.6	Total Meats	4	9.4	4	6.2	4	3.6
Total Fish	2	0.3	6	0.6	5	0.3	Total Fish	0	0.3	0	0.4	0	0.2
Total Eggs	25	3.8	20	2.1	19	1.3	Total Eggs	2	3.7	1	1.5	1	1.3
Total Grains	78	11.9	82	8.2	86	5.6	Total Grains	5	11.6	6	8.5	6	5.7
Total Vegetables	163	24.7	144	14.5	137	9.0	Total Vegetables	12	24.6	10	14.0	11	9.3
Total Fruits	237	35.8	279	28.0	277	18.1	Total Fruits	17	36.4	22	30.2	20	17.3
Total Fats[b]	37	5.5	41	4.1	55	3.6	Total Fats[b]	3	5.5	3	4.2	4	3.6

Table 14-11. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Dairy Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/day)						
Total Foods[a]	725	100.0	1,047	100.0	1,612	100.0
Total Dairy	64	8.9	355	33.9	886	55.0
Total Meats	75	10.4	72	6.9	70	4.3
Total Fish	4	0.6	6	0.5	6	0.4
Total Eggs	19	2.6	15	1.4	18	1.1
Total Grains	87	12.1	104	9.9	116	7.2
Total Vegetables	168	23.2	173	16.	183	11.3
Total Fruits	253	34.9	257	24.5	251	15.6
Total Fats[b]	40	5.6	49	4.7	63	3.9
Age Group: 6 to <11 years (g/day)						
Total Foods[a]	766	100.0	1,053	100.0	1,722	100.0
Total Dairy	63	8.2	372	35.4	892	51.8
Total Meats	99	12.9	80	7.6	87	5.1
Total Fish	6	0.8	5	0.5	6	0.4
Total Eggs	17	2.2	14	1.3	17	1.0
Total Grains	105	13.7	113	10.7	152	8.8
Total Vegetables	221	28.9	214	20.3	242	14.0
Total Fruits	194	25.3	175	16.6	227	13.2
Total Fats[b]	49	6.4	56	5.3	70	4.1
Age Group: 11 to <16 years (g/day)						
Total Foods[a]	747	100.0	1,094	100.0	2,020	100.0
Total Dairy	22	3.0	307	28.0	1,017	50.3
Total Meats	102	13.6	101	9.2	134	6.7
Total Fish	8	1.1	9	0.8	12	0.6
Total Eggs	20	2.7	18	1.6	25	1.2
Total Grains	104	13.9	133	12.2	181	9.0
Total Vegetables	239	32.0	265	24.2	322	16.0
Total Fruits	197	26.4	180	16.4	204	10.1
Total Fats[b]	47	6.2	62	5.6	100	5.0

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%
Age Group: 3 to <6 years (g/kg-day)						
Total Foods[a]	41	100.0	58	100.0	97	100.0
Total Dairy	4	8.8	20	34.2	52	54.0
Total Meats	4	10.6	4	6.6	4	4.4
Total Fish	0	0.5	0	0.5	0	0.3
Total Eggs	1	2.6	1	1.5	1	1.0
Total Grains	5	12.1	6	9.9	7	7.2
Total Vegetables	10	23.8	9	16.3	11	11.6
Total Fruits	14	34.0	14	24.7	16	16.5
Total Fats[b]	2	5.7	3	4.7	4	4.0
Age Group: 6 to <11 years (g/kg-day)						
Total Foods[a]	25	100.0	38	100.0	67	100.0
Total Dairy	2	8.1	13	34.2	35	51.9
Total Meats	3	13.2	2	8.0	3	4.9
Total Fish	0	0.8	0	0.5	0	0.4
Total Eggs	1	2.3	1	1.8	1	0.9
Total Grains	3	13.6	4	10.7	6	9.0
Total Vegetables	7	29.5	8	19.7	9	13.7
Total Fruits	6	24.4	7	17.8	9	13.5
Total Fats[b]	2	6.6	2	5.2	3	4.2
Age Group: 11 to <16 years (g/kg-day)						
Total Foods[a]	13	100.0	22	100.0	42	100.0
Total Dairy	0	2.9	6	27.3	21	49.4
Total Meats	2	13.8	2	9.6	3	6.4
Total Fish	0	1.0	0	0.6	0	0.8
Total Eggs	0	2.6	0	1.7	1	1.2
Total Grains	2	13.7	3	12.2	4	9.1
Total Vegetables	4	33.0	5	23.3	6	15.1
Total Fruits	3	25.7	4	17.8	5	11.9
Total Fats[b]	1	6.2	1	5.9	2	4.8

Table 14-11. Per Capita Intake of Total Foods and Major Food Groups, and Percent of Total Food Intake for Individuals With Low-End, Mid-Range, and High-End Total Dairy Intake (continued)

Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer		Food Group	Low-End Consumer		Mid-Range Consumer		High-End Consumer	
	Intake	%	Intake	%	Intake	%		Intake	%	Intake	%	Intake	%
	Age Group: 16 to <21 years (g/day)							Age Group: 16 to <21 years (g/kg-day)					
Total Foods[a]	647	100.0	1,095	100.0	2,233	100.0	Total Foods[a]	10	100.0	17	100.0	33	100.0
Total Dairy	8	1.2	197	18.0	950	42.5	Total Dairy	0	1.2	3	16.6	14	42.8
Total Meats	101	15.7	125	11.4	197	8.8	Total Meats	2	15.1	2	13.6	3	8.9
Total Fish	8	1.2	16	1.5	8	0.4	Total Fish	0	1.1	0	0.9	0	0.3
Total Eggs	12	1.8	28	2.5	27	1.2	Total Eggs	0	1.7	0	2.2	0	1.2
Total Grains	90	13.9	162	14.8	217	9.7	Total Grains	1	14.1	2	14.0	3	9.6
Total Vegetables	228	35.2	324	29.6	438	19.6	Total Vegetables	4	35.8	5	28.6	7	20.0
Total Fruits	152	23.5	154	14.1	249	11.2	Total Fruits	2	23.9	3	16.1	3	10.6
Total Fats[b]	37	5.8	73	6.7	114	5.1	Total Fats[b]	1	5.6	1	6.5	2	5.1
	Age Group: 20 years and older (g/day)							Age Group: 20 years and older (g/kg-day)					
Total Foods[a]	741	100.0	1,030	100.0	1,810	100.0	Total Foods[a]	10	100.0	14	100.0	25	100.0
Total Dairy	9	1.2	155	15.1	725	40.1	Total Dairy	0	1.2	2	14.8	10	41.0
Total Meats	117	15.8	129	12.6	156	8.6	Total Meats	2	15.8	2	12.3	2	7.3
Total Fish	16	2.2	16	1.6	19	1.1	Total Fish	0	2.1	0	1.6	0	1.0
Total Eggs	20	2.7	23	2.3	26	1.4	Total Eggs	0	2.7	0	2.3	0	1.4
Total Grains	113	15.2	130	12.6	176	9.7	Total Grains	2	15.0	2	12.5	2	9.5
Total Vegetables	258	34.8	304	29.6	361	20.0	Total Vegetables	4	34.5	4	29.5	5	19.4
Total Fruits	159	21.4	189	18.4	226	12.5	Total Fruits	2	21.9	3	19.4	3	14.2
Total Fats[b]	42	5.6	62	6.0	89	4.9	Total Fats[b]	1	5.5	1	5.9	1	4.5

[a] Total food intake was defined as intake of the sum of all foods in the following major food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. Beverages, sugar, candy, and sweets, and nuts and nut products were not included because they could not be categorized into the major food groups.

[b] Includes added fats such as butter, margarine, dressings and sauces, vegetable oil, etc.; does not include fats eaten as components of other foods such as meats.

Source: U.S. EPA analysis of 1994–1996, 1998 CSFII.

Table 14-12. Intake of Total Food[a] (g/kg-day), Edible Portion, Uncooked Weight

Age or Race/Ethnic Group	*N*	Mean	SE[b]	LCL[c]	UCL[d]	Percentiles										
						Min[e]	1st	5th	10th	25th	50th	75th	90th	95th	99th	Max[f]
<1 year	865	90.9	3.50	Age	98.1	0*	0*	0*	3.8	32.0	90.0	134.2	179.9	207.7*	277.8*	355.2*
1 to <3 years	1,052	113.1	2.46	108.0	118.1	0*	38.3*	54.0*	65.2	84.5	106.6	137.8	164.3	184.9*	244.2*	346.0*
3 to <6 years	978	78.6	1.27	76.0	81.2	0*	28.3*	41.3	45.9	55.5	73.0	96.5	119.0	136.5	167.4*	254.0*
6 to <13 years	2,256	47.1	1.15	44.7	49.4	0*	7.1*	16.1	21.3	30.1	42.2	59.3	76.8	92.3	128.1*	167.3*
13 to <20 years	3,450	27.5	0.69	26.0	28.9	0*	5.0	9.4	11.7	17.1	24.5	34.8	46.6	56.3	75.2	122.0*
20 to <50 years	4,289	29.4	0.74	27.9	30.9	0*	4.1	9.4	12.1	17.8	25.9	37.6	52.3	62.8	82.1	211.2*
≥50 years	3,893	29.1	0.55	28.0	30.3	0*	0	10.0	13.0	18.6	26.2	36.3	49.5	58.5	80.8	119.6*
All Ages	16,783	36.1	0.56	35.0	37.2	0*	3.4	10.0	13.0	19.4	28.8	43.1	66.7	89.4	148.0	355.2*
Female 13 to 49 years	4,103	28.8	0.85	27.1	30.5	0*	3.1	9.0	11.5	17.1	24.9	36.7	52.7	62.9	84.1	211.2*
Mexican American	4,450	40.2	0.86	38.4	42.0	0*	4.8	11.1	14.0	19.7	29.5	48.7	82.6	108.4	163.5	278.1*
Non−Hispanic Black	4,265	30.7	0.85	29.0	32.4	0*	0	7.1	9.6	14.6	22.3	36.8	60.8	83.4	147.4	304.1*
Non−Hispanic White	6,757	36.0	0.72	34.6	37.5	0*	5.4	10.5	13.5	20.2	29.5	43.1	64.9	84.1	141.9	355.2*
Other Hispanic	562	39.5	2.01	35.4	43.7	0*	0*	12.1	14.1	20.8	27.9	42.9	83.1	115.2	170.7*	346.0*
Other	749	40.3	1.94	36.3	44.3	0*	0*	11.2	14.1	21.9	31.9	50.1	76.6	99.0	157.1*	315.6*

[a] Total food includes all foods, beverages, and water ingested.
[b] SE = Standard error of the mean.
[c] LCL = Lower confidence limit of the mean.
[d] UCL = Upper confidence limit of the mean.
[e] Min = Minimum value.
[f] Max = Maximum value.
* Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Source: U.S. EPA analysis of NHANES 2003−2006 data.

15. HUMAN MILK INTAKE

15.1. INTRODUCTION

Human lactation is known to impart a wide range of benefits to nursing infants, including protection against infection, increases in cognitive development, and avoidance of allergies due to intolerance to cow's milk (Gartner et al., 2005). Ingestion of human milk also has been associated with a reduction in risk of post-neonatal death in the United States. (Chen and Rogan, 2004). The American Academy of Pediatrics (AAP) recommends exclusive breast-feeding for approximately the first 6 months and supports the continuation of breast-feeding for the first year and beyond if desired by the mother and child (Gartner et al., 2005). However, contaminants may find their way into human milk of lactating mothers because mothers are themselves exposed, thus making human milk a potential source of exposure to toxic substances for nursing infants. Lipid-soluble chemical compounds accumulate in body fat and may be transferred to breast-fed infants in the lipid portion of human milk. Water soluble chemicals also may partition into the aqueous phase and be excreted via human milk. Because nursing infants obtain most—if not all—of their dietary intake from human milk, they are especially vulnerable to exposures to these compounds. Estimating the magnitude of the potential dose to infants from human milk requires information on the milk intake rate (quantity of human milk consumed per day) and the duration (months) over which breast-feeding occurs. Information on the fat content of human milk also is needed for estimating dose from human milk residue concentrations that have been indexed to lipid content.

Several studies have generated data on human milk intake. Typically, human milk intake has been measured over a 24-hour period by weighing the infant before and after each feeding without changing its clothing (test weighing). The sum of the difference between the measured weights over the 24-hour period is assumed to be equivalent to the amount of human milk consumed daily. Intakes measured using this procedure are often corrected for evaporative water losses (insensible water losses) between infant weighings (NAS, 1991). Neville et al. (1988) evaluated the validity of the test weight approach among bottle-fed infants by comparing the weights of milk taken from bottles with the differences between the infants' weights before and after feeding. When test weight data were corrected for insensible weight loss, they were not significantly different from bottle weights. Conversions between weight and volume of human milk consumed are made using the density of human milk (approximately 1.03 g/mL) (NAS, 1991). Techniques for measuring human milk intake using stable isotopes such as deuterium have been developed. The advantages of these techniques over test weighing procedures are that they are less burdensome for the mother and do not interfere with normal behavior (Albernaz et al., 2003). However, few data based on this technique were found in the literature.

Among infants born in 2004, 73.8% were breast-fed postpartum, 41.5% at 6 months, and 20.9% at 12 months. Studies of nursing mothers in industrialized countries have shown that average intakes among infants ranged from approximately 500 to 800 mL/day, with the highest intake reported for infants 3 to <6 months old (see Table 15-1).

The recommendations for human milk intake rates and lipid intake rates are provided in the next section along with a summary of the confidence ratings for these recommendations. The recommended values are based on key studies identified by U.S. Environmental Protection Agency (EPA) for this factor. Following the recommendations, key studies on human milk intake are summarized. Relevant data on lipid content and fat intake, breast-feeding duration, and the estimated percentage of the U.S. population that breast-feeds also are presented.

A number of other studies exist in the literature, but they focus on other aspects of lactation such as growth patterns of nursing infants, supplementary food and energy intake, and nutrition of lactating mothers (González-Cossío et al., 1998; Drewett et al., 1993; Dewey et al., 1992). These studies are not included in this chapter because they do not focus on the exposure factor of interest. Other studies in the literature focus on formula intake. Because some baby formula is prepared by adding water, these data are presented in Chapter 3-Ingestion of Water and Other Select Liquids.

15.2. RECOMMENDATIONS

The studies described in Section 15.3 were used in selecting recommended values for human milk intake and lipid intake. Although different survey designs, testing periods, and populations were used by the studies to estimate intake, the mean and standard deviation estimates reported in these studies are relatively consistent. There are, however, limitations with the data. With the exception of Butte et al. (1984) and Arcus-Arth et al. (2005), data were not presented on a body weight basis. This is particularly important because intake rates may be higher on a body weight basis for younger infants

than older infants. Also, the data used to derive the recommendations are more than 15 years old and the sample size of the studies was small. Other populations of concern—such as mothers highly committed to breast-feeding, sometimes for periods longer than 1 year—may not be captured by the studies presented in this chapter. Note that data for infants 12 months old are not included in the recommendation table because the U.S. EPA's standard age group for children, as described in Chapter 1 of this handbook, is 6 to <12 months and it may not be appropriate to use this value to represent the next age group of 1 to <2 years old.

15.2.1. Human Milk Intake

Table 15-1 presents a summary of recommended values for human milk and lipid intake rates, and Table 15-2 presents the confidence ratings for these recommendations. The human milk intake rates for nursing infants that have been reported in the studies described in this section are summarized in Table 15-3 in units of mL/day and in Table 15-4 in units of mL/kg-day (i.e., indexed to body weight). It should be noted that the decrease in human milk with age is likely a result of complementary foods being introduced as the child grows and not necessarily a decrease in total energy intake. To conform to the new standardized age groupings used in this handbook (see Chapter 1), data from Pao et al. (1980), Dewey and Lönnerdal (1983), Butte et al. (1984), Neville et al. (1988), Dewey et al. (1991a), Dewey et al. (1991b), Butte et al. (2000), and Arcus-Arth et al. (2005) were compiled for each month of the first year of life. Recommendations were converted to mL/day by using a density of human milk of 1.03 g/mL, and rounded to two significant figures. Only two studies [i.e., Butte et al. (1984), and Arcus-Arth et al. (2005)] provided data on a body weight basis. For some months, multiple studies were available; for others only one study was available. Weighted means were calculated for each age in months. When upper percentiles were not available from a study, they were estimated by adding two standard deviations to the mean value. When multiple studies were available, recommendations for upper percentiles were calculated as the midpoint of the range of upper percentile values of the studies available for each age in months. These month-by-month intakes were composited to yield intake rates for the standardized age groups by calculating a weighted average. Recommendations are provided for the population of exclusively breast-fed infants because this population may have higher exposures than partially breast-fed infants. *Exclusively breast-fed* in this chapter refers to infants whose sole source of milk comes from human milk, with no other milk substitutes. *Partially breast-fed* refers to infants whose source of milk comes from both human milk and other milk substitutes (i.e., formula). Note that some studies define partially breast-fed as infants whose dietary intake comes from not only human milk and formula, but also from other solid foods (e.g., strained fruits, vegetables, meats).

15.2.2. Lipid Content and Lipid Intake

Table 15-5 presents recommended lipid intake rates in units of mL/day. The table parallels the human milk intake tables (see Table 15-3). With the exception of the data from Butte et al. (1984), the rates were calculated assuming a lipid content of 4% (Kent et al., 2006; Arcus-Arth et al., 2005; Mitoulas et al., 2003; Mitoulas et al., 2002; NAS, 1991; Butte et al., 1984). In the case of the Butte et al. (1984) study, lipid intake rates were provided and were used in place of the estimated lipid intakes. Table 15-6 presents lipid intake rates on a body weight basis (mL/kg-day). These were calculated from the values presented in Table 15-4 multiplied by 4% lipid content.

Table 15-1. Recommended Values for Human Milk and Lipid Intake Rates for Exclusively Breast-Fed Infants

	Mean		Upper Percentile[a]		
Age Group	mL/day	mL/kg-day	mL/day	mL/kg-day	Source
		Human Milk Intake			
Birth to <1 month	510	150	950	220	b, c
1 to <3 months	690	140	980	190	b, c, d, e, f
3 to <6 months	770	110	1,000	150	b, c, d, e, f, g, h
6 to <12 months	620	83	1,000	130	b, c, d, f, g, h
		Lipid Intake[i]			
Birth to <1 month	20	6.0	38	8.7	b, c
1 to <3 months	27	5.5	40	8.0	b, c, d, e, f
3 to <6 months	30	4.2	42	6.1	b, c, d, e, f, g, h
6 to <12 months	25	3.3	42	5.2	b, c, d, f, g, h

[a] Upper percentile is reported as mean plus 2 standard deviations.
[b] Neville et al. (1988).
[c] Arcus-Arth et al. (2005).
[d] Pao et al. (1980).
[e] Butte et al. (1984).
[f] Dewey and Lönnerdal (1983).
[g] Butte et al. (2000).
[h] Dewey et al. (1991b).
[i] The recommended value for the lipid content of human milk is 4.0%. See Section 15.4

Table 15-2. Confidence in Recommendations for Human Milk Intake

General Assessment Factors	Rationale	Rating
Soundness		Medium
Adequacy of Approach	Methodology uses changes in body weight as a surrogate for total ingestion. More sophisticated techniques measuring stable isotopes have been developed, but data with this technique were not available. Sample sizes from individual studies were relatively small (7–108). Mothers selected for the studies were volunteers. The studies analyzed primary data.	
Minimal (or defined) Bias	Mothers were instructed in the use of infant scales to minimize measurement errors. Three out of the eight studies indicated correcting data for insensible water loss. Some biases may be introduced by including partially breast-fed infants.	
Applicability and Utility		Medium
Exposure Factor of Interest	The studies focused on estimating human milk intake.	
Representativeness	Most studies focused on the U.S. population, but were not national samples. Populations studied were mainly from high socioeconomic status. One study included populations from Sweden and Finland. However, this may not affect the amount of intake, but, rather, the prevalence and initiation of lactation.	
Currency	Studies were conducted between 1980 and 2000. However, this may not affect the amount of intake but rather the prevalence and initiation of lactation.	
Data Collection Period	Infants were not studied long enough to fully characterize day-to-day variability.	
Clarity and Completeness		Medium
Accessibility	All key studies are available from the peer-reviewed literature.	
Reproducibility	The methodology was clearly presented, but some studies did not discuss adjustments due to insensible weight loss.	
Quality Assurance	Some steps were taken to ensure data quality. For example, mothers were trained to use the scales. However, this element could not be fully evaluated from the information presented in the published studies.	
Variability and Uncertainty		Low
Variability in Population	Variability was not very well-characterized. Mothers committed to breast-feeding more than 1 year were not captured.	
Uncertainty	Not correcting for insensible water loss may underestimate intake.	
Evaluation and Review		High
Peer Review	The studies appeared in peer-reviewed journals.	
Number and Agreement of Studies	There are eight key studies. The results of studies from different researchers are in agreement.	
Overall Rating		**Medium**

Table 15-3. Human Milk Intake Rates Derived From Key Studies for Exclusively Breast-Fed Infants (mL/day)

Age (months)	Number of Children	Mean Intake (mL/day)	Upper Percentile Consumption (mL/day)[a]	Source	Weighted Mean Intake and Upper Percentile Consumption (across all key studies) (mL/day)			
					Individual Age		Composite Age Groups	
					Mean[b]	Upper[c]	Mean[b]	Upper[c]
0 <1	6 to 13	511	951	Neville et al. (1988)	511	951	511	951
1	11	600	918	Pao et al. (1980)	670	973	692	983
	37	729	981	Butte et al. (1984)				
	10 to 12	679[d]	889	Neville et al. (1988)				
	16	673	1,057	Dewey and Lönnerdal (1983)				
2	10 to 12	679[d]	889	Neville et al. (1988)	713	992		
	19	756	1,096	Dewey and Lönnerdal (1983)				
	40	704	958	Butte et al. (1984)				
3	2	833	–[e]	Pao et al. (1980)	758	1,025	769	1,024
	37	702	924	Butte et al. (1984)				
	10	713	935	Neville et al. (1988)				
	16	782	1,126	Dewey and Lönnerdal (1983)				
	73	788	1,047	Dewey et al. (1991b)				
	40	728	988	Butte et al. (2000)				
4	12	690	888	Neville et al. (1988)	739	991		
	13	810	1,094	Dewey and Lönnerdal (1983)				
	41	718	996	Butte et al. (1984)				
5	12	814	1,074	Neville et al. (1988)	810	1,057		
	11	805	1,039	Dewey and Lönnerdal (1983)				
6	1	682	–[e]	Pao et al. (1980)	741	1,059		
	13	744	978	Neville et al. (1988)				
	11	896	1,140	Dewey and Lönnerdal (1983)				
	60	747	1,079	Dewey et al. (1991b)				
	30	637	1,050	Butte et al. (2000)				
7	12	700	1,000	Neville et al. (1988)	700	1,000	622	1,024
8	9	604	1,012	Neville et al. (1988)	604	1,012		
9	12	600	1,028	Neville et al. (1988)	614	1,039		
	50	627	1,049	Dewey et al. (1991b)				
10	11	535	989	Neville et al. (1988)	535	989		
11	8	538	1,004	Neville et al. (1988)	538	1,004		
12	8	391	877	Neville et al. (1988)	410	904	410	904
	42	435	922	Dewey et al. (1991b; 1991a)				
	13	403	931	Butte et al. (2000)				

[a] Upper percentile is reported as mean plus 2 standard deviations.
[b] Calculated as the mean of the means.
[c] Middle of the range of upper percentiles.
[d] Calculated for infants 1 to <2 months old.
[e] Standard deviations and upper percentiles not calculated for small sample sizes.

Table 15-4. Human Milk Intake Rates Derived From Key Studies for Exclusively Breast-Fed Infants (mL/kg-day)

Age (months)	Number of Children	Mean Intake (mL/kg-day)	Upper Percentile Consumption (mL/kg-day)[a]	Source	Weighted Mean Intake and Upper Percentile Consumption (cross all key studies) (mL/kg-day)			
					Individual Age		Composite Age Groups	
					Mean[b]	Upper[c]	Mean	Upper[c]
0 <1	9 to 25	150	217	Arcus-Arth et al. (2005)	150	217	150	217
1	37	154	200	Butte et al. (1984)	152	199	144	187
	25	150	198	Arcus-Arth et al. (2005)				
2	40	125	161	Butte et al. (1984)	135	175		
	25	144	188	Arcus-Arth et al. (2005)				
3	37	114	152	Butte et al. (1984)	121	158	110	149
	108	127	163	Arcus-Arth et al. (2005)				
4	41	108	142	Butte et al. (1984)	110	145		
	57	112	148	Arcus-Arth et al. (2005)				
5	26	100	140	Arcus-Arth et al. (2005)	100	140		
6	39	101	141	Arcus-Arth et al. (2005)	101	141	83	130
7	8	75	125	Arcus-Arth et al. (2005)	75	125		
9	57	72	118	Arcus-Arth et al. (2005)	72	118		
12	42	47	101	Arcus-Arth et al. (2005)	47	101	47	101

[a] Upper percentile is reported as mean plus two standard deviations.
[b] Calculated as the mean of the means.
[c] Middle of the range of upper percentiles.

Table 15-5. Lipid Intake Rates Derived From Key Studies for Exclusively Breast-Fed Infants (mL/day)[a]

Age (months)	Number of Children	Mean Intake (mL/day)	Upper Percentile Consumption (mL/day)[b]	Source	Weighted Mean Intake and Upper Percentile Consumption (across all key studies) (mL/day)			
					Individual Age		Composite Age Groups	
					Mean[c]	Upper[d]	Mean[c]	Upper[d]
0 <1	6 to 13	20	38	Neville et al. (1988)	20	38	20	38
1	11	24	37	Pao et al. (1980)	26	39	27	40
	37	27	43	Butte et al. (1984)				
	10 to 12	27	36	Neville et al. (1988)				
	16	27	42	Dewey and Lönnerdal (1983)				
2	10 to 12	27	36	Neville et al. (1988)	27	40		
	19	30	44	Dewey and Lönnerdal (1983)				
	40	24	38	Butte et al. (1984)				
3	2	33	–[e]	Pao et al. (1980)	30	41	30	42
	37	23	37	Butte et al. (1984)				
	10	29	37	Neville et al. (1988)				
	16	31	45	Dewey and Lönnerdal (1983)				
	73	32	42	Dewey et al. (1991b)				
	40	29	40	Butte et al. (2000)				
4	12	28	36	Neville et al. (1988)	28	40		
	13	32	44	Dewey and Lönnerdal (1983)				
	41	25	41	Butte et al. (1984)				
5	12	33	43	Neville et al. (1988)	33	43		
	11	32	42	Dewey and Lönnerdal (1983)				
6	1	27	–[e]	Pao et al. (1980)	30	40		
	13	30	39	Neville et al. (1988)				
	11	36	46	Dewey and Lönnerdal (1983)				
	60	30	43	Dewey et al. (1991b)				
	30	25	42	Butte et al. (2000)				
7	12	28	40	Neville et al. (1988)	28	40	25	42
8	9	24	40	Neville et al. (1988)	24	40		
9	12	24	41	Neville et al. (1988)	24	41		
	50	25	42	Dewey et al. (1991b)				
10	11	21	40	Neville et al. (1988)	21	40		
11	9	22	40	Neville et al. (1988)	22	40		
12	9	16	35	Neville et al. (1988)	16	36	16	36
	42	17	37	Dewey et al. (1991b; 1991a)				
	13	16	37	Butte et al. (2000)				

[a] Except for Butte et al. (1984), values were calculated from Table 15-3 using 4% lipid content.
[b] Upper percentile is reported as mean plus 2 standard deviations.
[c] Calculated as the mean of the means.
[d] Middle of the range of upper percentiles.
[e] Standard deviations and upper percentiles not calculated for small sample sizes.

Table 15-6. Lipid Intake Rates Derived From Key Studies for Exclusively Breast-Fed Infants (mL/kg-day)[a]

Age (months)	Number of Children	Mean Intake (mL/kg-day)	Upper Percentile Consumption (mL/kg-day)[b]	Source	Weighted Mean Intake and Upper Percentile Consumption[b] (across all key studies) (mL/kg-day)			
					Individual Age		Composite Age Groups	
					Mean[c]	Upper[d]	Mean[e]	Upper[d]
0 <1	9 to 25	6.0	8.7	Arcus-Arth et al. (2005)	6.0	8.7	6.0	8.7
1	37 25	5.7 6.0	9.1 8.7	Butte et al. (1984) Arcus-Arth et al. (2005)	5.9	8.9	5.5	8.0
2	40 25	4.3 5.8	6.7 7.5	Butte et al. (1984) Arcus-Arth et al. (2005)	5.1	7.1		
3	37 108	3.7 5.1	6.1 6.5	Butte et al. (1984) Arcus-Arth et al. (2005)	4.4	6.3	4.2	6.1
4	41 57	3.7 4.5	6.3 5.9	Butte et al. (1984) Arcus-Arth et al. (2005)	4.1	6.1		
5	26	4.0	5.6	Arcus-Arth et al. (2005)	4.0	5.8		
6	39	4.0	5.6	Arcus-Arth et al. (2005)	4.0	5.6	3.3	5.2
7	8	3.0	5.0	Arcus-Arth et al. (2005)	3.0	5.0		
9	57	2.9	4.7	Arcus-Arth et al. (2005)	2.9	4.7		
12	42	1.9	4.0	Arcus-Arth et al. (2005)	1.9	4.0	1.9	4.0

[a] Except for Butte et al. (1984), values were calculated from Table 15-4 using 4% lipid content.
[b] Upper percentile is reported as mean plus two standard deviations.
[c] Calculated as the mean of the means.
[d] Middle of the range of upper percentiles.

15.3. KEY STUDIES ON HUMAN MILK INTAKE

15.3.1. Pao et al. (1980)—Milk Intakes and Feeding Patterns of Breast-Fed Infants

Pao et al. (1980) conducted a study of 22 healthy nursing infants to estimate human milk intake rates. Infants were categorized as completely breast-fed or partially breast-fed. Breast-feeding mothers were recruited through La Leche League groups. Except for one Black infant, all other infants were from White middle-class families in southwestern Ohio. The goal of the study was to enroll infants as close to 1 month of age as possible and to obtain records near 1, 3, 6, and 9 months of age (Pao et al., 1980). However, not all mother-infant pairs participated at each time interval. Data were collected for these 22 infants using the test weighing method. Records were collected for three consecutive 24-hour periods at each test interval. The weight of human milk was converted to volume by assuming a density of 1.03 g/mL. Daily intake rates were calculated for each infant based on the mean of the three 24-hour periods. Table 15-7 presents mean daily human milk intake rates for the infants surveyed at each time interval. These data are presented as they are reported in Pao et al. (1980). For completely breast-fed infants, the mean intake rates were 600 mL/day at 1 month of age, 833 mL/day at 3 months of age, and 682 mL/day at 6 months of age. Partially breast-fed infants had mean intake rates of 485 mL/day, 467 mL/day, 395 mL/day, and <554 mL/day at 1, 3, 6, and 9 months of age, respectively. Pao et al. (1980) also noted that intake rates for boys in both groups were slightly higher than for girls.

The advantage of this study is that data for both exclusively and partially breast-fed infants were collected for multiple time periods. Also, data for individual infants were collected over 3 consecutive days, which would account for some individual variability. However, the number of infants in the study was relatively small. In addition, this study did not account for insensible weight loss, which may underestimate the amount of human milk ingested.

15.3.2. Dewey and Lönnerdal (1983)—Milk and Nutrient Intake of Breast-Fed Infants From 1 to 6 Months: Relation to Growth and Fatness

Dewey and Lönnerdal (1983) monitored the dietary intake of 20 nursing infants between age 1 and 6 months. The number of study participants dropped to 13 by the end of the 6th month. Most of the infants in the study were exclusively breast-fed. One infant's intake was supplemented by formula during the first and second month of life. During the 3rd, 4th, and 5th months, three, four, and five infants, respectively, were given some formula to supplement their intake. Two infants were given only formula (no human milk) during the 6th month. According to Dewey and Lönnerdal (1983), the mothers were all well-educated and recruited through Lamaze childbirth classes in the Davis area of California. Human milk intake volume was estimated based on two 24-hour test weighings per month. Table 15-8 presents human milk intake rates for the various age groups. Human milk intake averaged 673, 782, and 896 mL/day at 1, 3, and 6 months of age, respectively.

The advantage of this study is that it evaluated nursing infants for a period of 6 months based on two 24-hour observations per infant per month. However, corrections for insensible weight loss apparently were not made. Also, the number of infants in the study was relatively small, and the study participants were not representative of the general population. During the study period, some infants were given some formula (i.e., up to five infants during the 5th month). Without the raw data, these subjects could not be excluded from the study results. Thus, these subjects may affect the results when deriving recommendations for exclusively breast-fed infants.

15.3.3. Butte et al. (1984)—Human Milk Intake and Growth in Exclusively Breast-Fed Infants

Human milk intake was studied in exclusively breast-fed infants during the first 4 months of life (Butte et al., 1984). Nursing mothers were recruited through the Baylor Milk Bank Program in Texas. Forty-five mother-infant pairs participated in the study. However, data for some time periods (i.e., 1, 2, 3, or 4 months) were missing for some mothers as a result of illness or other factors. The mothers were from the middle-to-upper socioeconomic stratum and had a mean age of 28.0 ± 3.1 years. A total of 41 mothers were White, 2 were Hispanic, 1 was Asian, and 1 was West Indian. Infant growth progressed satisfactorily during the course of the study.

The amount of milk ingested over a 24-hour period was determined by weighing the infant before and after feeding. The study did not indicate whether the data were corrected for insensible water or weight loss. The study evaluated the accuracy of the test weighing procedure using a bottle-fed infant. Test weighing occurred over a 24-hour period for most study participants, but intake among several infants was studied over longer periods (48 to 96 hours) to

assess individual variation in intake. Eight of the infants received some food supplementation during the study period. Six of them received less than 60 kcal/day of formula, oatmeal, glucose water, or rice water for 1 or 2 days. One infant received an additional 90 kcal/day of infant formula and rice water for 6 days during the 4th month because of inadequate milk production. When converting values reported as g/day to mL/day, using a conversion factor of 1.03 g/mL, mean human milk intake ranged from 702 mL/day at 3 months to 729 mL/day at 1 month, with an overall mean of 712 mL/day for the entire study period (see Table 15-9). Intakes also were calculated on the basis of body weight (see Table 15-9).

The advantage of this study is that data for a larger number of exclusively breast-fed infants were collected than in previous studies. However, data were collected for infants up to 4 months and day-to-day variability was not characterized for all infants. Eighteen percent (i.e., 8 out of 45) of the infants received some formula supplementation during the study period. Without the raw data, these subjects could not be excluded from the study results. Therefore, values derived from this study for exclusively breast-fed infants may be somewhat underestimated.

15.3.4. Neville et al. (1988)—Studies in Human Lactation: Milk Volumes in Lactating Women During the Onset of Lactation and Full Lactation

Neville et al. (1988) studied human milk intake among 13 infants during the 1st year of life. The mothers were all multiparous, non-smoking, White women of middle- to upper-socioeconomic status living in Denver, CO. All women in the study practiced exclusive breast-feeding for at least 5 months. Solid foods were introduced at mean age of 7 months. Daily milk intake was estimated by the test weighing method with corrections for insensible weight loss. Data were collected daily from birth to 14 days, weekly from weeks 3 through 8, and monthly until the study period ended at 1 year after inception. One infant was weaned at 8 months, while all others were weaned on or after the 12 months. Formula was used occasionally (≤ 240 mL/week) after 4 months in three infants. Table 15-10 lists the estimated human milk intakes for this study. Converting values reported as g/day to mL/day, using a conversion factor of 1.03 g/mL, mean human milk intakes were 748 mL/day, 713 mL/day, 744 mL/day, and 391 mL/day at 1, 3, 6, and 12 months of age, respectively.

In comparison to the previously described studies, Neville et al. (1988) collected data on numerous days over a relatively long time period (12 months) and they were corrected for insensible weight loss. However, the intake rates presented in Table 15-10 are estimated based on intake only during a 24-hour period. Consequently, these intake rates are based on short-term data that do not account for day-to-day variability among individual infants. Also, a smaller number of subjects was included than in the previous studies. Three infants were given some formula after 4 months. Without the raw data, these subjects could not be excluded from the study results. Thus, data presented for infants between 5 and 12 months may underestimate the intake of exclusively breast-fed infants.

15.3.5. Dewey et al. (1991b; 1991a)—(a) Maternal Versus Infant Factors Related to Human Milk Intake and Residual Volume: The DARLING Study; (b) Adequacy of Energy Intake Among Breast-Fed Infants in the DARLING Study: Relationships to Growth, Velocity, Morbidity, and Activity Levels

The Davis Area Research on Lactation, Infant Nutrition and Growth (DARLING) study was conducted in 1986 to evaluate growth patterns, nutrient intake, morbidity, and activity levels in infants who were breast-fed for at least their first 12 months of life (Dewey et al., 1991b; Dewey et al., 1991a). Subjects were non-randomly selected through letters to new parents using birth listings. One of the criteria used for selection was that mothers did not plan to feed their infants more than 120 mL/day of other milk or formula for the first 12 months of life. Seventy-three infants aged 3 months were included in the study. At subsequent time intervals, the number of infants included in the study was somewhat lower as a result of attrition. All infants in the study were healthy and of normal gestational age and weight at birth, and they did not consume solid foods until after they were 4 months old. The mothers were highly educated and of "relatively high socioeconomic status."

Human milk intake was estimated by weighing the infants before and after each feeding and correcting for insensible water loss. Test weighings were conducted over a 4-day period every 3 months. The results of the study indicate that human milk intake declines over the first 12 months of life. This decline is associated with the intake of solid food. When converting values reported as g/day to mL/day, using a conversion factor of 1.03 g/mL, mean human

milk intake was estimated to be 788 mL/day, 747 mL/day, 627 mL/day, and 435 mL/day at 3, 6, 9, and 12 months, respectively (see Table 15-11). Based on the estimated intakes at 3 months of age, variability between individuals (coefficient of variation [CV] = 16.3%) was higher than the average day-to-day variability (CV = 8.9 ± 5.4%) for the infants in the study (Dewey et al., 1991a).

The advantages of this study are that data were collected over a relatively long-time (4 days) period at each test interval, which would account for some day-to-day infant variability, and corrections for insensible water loss were made. Data from this study are assumed to represent exclusively breast-fed infants because mothers were specifically recruited for that purpose. It is, however, unclear from the Dewey et al. (1991a) study if this criterion was met throughout the length of the study period.

15.3.6. Butte et al. (2000)—Infant Feeding Mode Affects Early Growth and Body Composition

Butte et al. (2000) conducted a study to assess the effect of infant feeding mode on growth and body composition during the first 2 years of life. The study was conducted in the Houston, TX, area, recruited through the Children's Nutrition Research Center (CNRC) referral system. The study was approved by the Baylor Affiliates Review Boards for Human Subject Research. The overall sample was 76 healthy term infants at 0.5, 3, 6, 9, 12, 18, and 24 months of age. The sample size varied between 71 to 76 infants for each age group. Repeated measurements for body composition and anthropometric were performed. The mothers agreed to either exclusively breast-feed or formula feed the infants for the first 4 months of life.

At 3-month or 6-month study intervals, the feeding history was taken. The mothers or caretakers were questioned about breast-feeding frequency, and the use of formula, milk, juice, solids, water, and vitamin or mineral supplements. Also, infant food intake was quantified at 3, 6, 12, and 24 months with a 3-day weighted intake record completed by the mother or caretaker (Butte et al., 2000). The intake of human milk was assessed by test weighing; the infant weights were calculated before and after each feeding. Using a pre-weighing and post-weighing method, the intake of formula and other foods and beverages was measured for 3 days by the mothers using a digital scale and recorded on predetermined forms.

The average duration of breast-feeding was 11.4 months (standard deviation [SD] = 5.8). Butte et al. (2000) reported that infants were exclusively breast-fed for at least the first 4 months—except for one who was weaned at 109 days, another who received formula at 102 days, and another who was given cereal at 106 days. Table 15-12 shows the infant feeding characteristics. Table 15-13 shows the intakes of human milk for the infants. When converting values reported as g/day to mL/day, using a conversion factor of 1.03 g/mL, mean human milk intake was estimated to be 728 mL/day at 3 months (weighted average of boys and girls), 637 mL/day at 6 months (weighted average of boys and girls), and 403 mL/day at 12 months (weighted average of boys and girls) (see Table 15-13). Table 15-14 shows feeding practices by percentage for infants. Table 15-15 provides the mean body weights of breast-fed infants.

Advantages of this study are that it provides intake data for breast-fed infants for their first 4 months. The study also provides the mean weights for the infants by feeding type and by sex. The limitations of the study are that the sample size is small and limited to one geographical location. The authors did not indicate if results were corrected for insensible weight loss. Because mothers could introduce formula after 4 months, only the data for the 3-month old infants can be considered exclusively breast-fed.

15.3.7. Arcus-Arth et al. (2005)—Breast Milk and Lipid Intake Distributions for Assessing Cumulative Exposure and Risk

Arcus-Arth et al. (2005) derived population distributions for average daily milk and lipid intakes in g/kg-day for infants age 0–6 months and 0–12 months for infants fed according to the AAP recommendations. The AAP recommends exclusively breast-feeding for the first 6 months of life, with human milk as the only source of milk until age 1 year and the introduction of solid foods after 6 months. The distributions were derived based on data in the peer-reviewed literature and data sets supplied by the publication authors for infants 7 days and older (Arcus-Arth et al., 2005). As cited in Arcus-Arth et al. (2005), data sources included Dewey et al. (1991b; 1991a), Hofvander et al. (1982), Neubauer et al. (1993), Ferris et al. (1993), Salmenpera et al. (1985), and Stuff and Nichols (1989). The authors also evaluated intake rates for infants breast-fed exclusively over the 1st year and provided a regression line of intake versus age for estimating short-term exposures. Arcus-Arth et al. (2005) derived human milk intake rates for the entire infant population (nursing and non-nursing) from

U.S. data on consumption, prevalence and duration. Arcus-Arth et al. (2005) defined *exclusive breast-feeding* (EBF) as "breast milk is the sole source of calories, with no or insignificant calories from other liquid or solid food sources," and *predominant breast-feeding* as "breast milk is the sole milk source with significant calories from other foods." The data that were consistent with AAP advice were used to construct the AAP data set (Arcus-Arth et al., 2005). The 0–12 months EBF data set was created using 0–6 month AAP data and data from the EBF infants older than 6 months of age. Because there are no data in the AAP data set for any individual infant followed at regular, frequent intervals during the 12-month period, population distributions were derived with assumptions regarding individual intake variability over time (Arcus-Arth et al., 2005). Two methods were used. In Method 1, the average population daily intake at each age was described by a regression line, assuming normality. Arcus-Arth et al. (2005) noted that age specific intake data were consistent with the assumption of normality. In Method 2, intake over time was simulated for 2,500 hypothetical infants and the distribution intakes derived from 2,500 individual intakes (Arcus-Arth et al., 2005). The population intake distribution was derived following Method 1. Table 15-16 presents the means and standard deviations for intake data at different ages; the variability was greatest for the two youngest and three oldest age groups. The values in Table 15-16 using Method 1 were used to derive the recommendations presented in Table 15-1 because it provides data for the fine age categories. When converting values reported as g/day to mL/day, using a conversion factor of 1.03 g/mL, mean human milk intake was estimated to be 150 mL/kg-day at 1 month, 127 mL/kg-day at 3 months, 101 mL/kg-day at 6 months, and 47 mL/kg-day at 12 months (see Table 15-16). Time weighted average intakes for larger age groups (i.e., 0–6 months, 0–12 months) are presented in Table 15-17.

An advantage of this study is that it was designed to represent the infant population whose mothers follow the AAP recommendations. Intake was calculated on a body weight basis. In addition, the data used to derive the distributions were from peer-reviewed literature and data sets supplied by the publication authors. The distributions were derived from data for infants fed in accordance to AAP recommendations, and they most likely represent daily average milk intake for a significant portion of breast-fed infants today (Arcus-Arth et al., 2005). The limitations of the study are that the data used were from mothers who were predominantly White, well-nourished, and from middle or high socioeconomic status. Arcus-Arth et al. (2005) also included data from Sweden and Finland. However, human milk volume in mL/day is similar among all women except for severely malnourished women (Arcus-Arth et al., 2005). According to Arcus-Arth et al. (2005): "Although few infants are exclusively breast-fed for 12 months, the EBF distributions may represent a more highly exposed subpopulation of infants exclusively breast-fed in excess of 6 months."

15.4. KEY STUDIES ON LIPID CONTENT AND LIPID INTAKE FROM HUMAN MILK

Human milk contains more than 200 constituents, including lipids, various proteins, carbohydrates, vitamins, minerals, and trace elements as well as enzymes and hormones. The lipid content of human milk varies according to the length of time that an infant nurses, and it increases from the beginning to the end of a single nursing session (NAS, 1991). The lipid portion accounts for approximately 4% of human milk (3.9% ± 0.4%) (NAS, 1991). This value is supported by various studies that evaluated lipid content from human milk (Kent et al., 2006; Arcus-Arth et al., 2005; Mitoulas et al., 2003; Mitoulas et al., 2002; Butte et al., 1984). Several studies also estimated the quantity of lipid consumed by breast-feeding infants. These values are appropriate for performing exposure assessments for nursing infants when the contaminant(s) have residue concentrations that are indexed to the fat portion of human milk.

15.4.1. Butte et al. (1984)—Human Milk Intake and Growth in Exclusively Breast-Fed Infants

Butte et al. (1984) analyzed the lipid content of human milk samples taken from women who participated in a study of human milk intake among exclusively breast-fed infants. The study was conducted with more than 40 women during a 4-month period. Table 15-18 presents the mean lipid content of human milk at various infants' ages. The overall lipid content for the 4-month study period was 3.43 ± 0.69% (3.4%). Butte et al. (1984) also calculated lipid intakes from 24-hour human milk intakes and the lipid content of the human milk samples. Lipid intake was estimated to range from 22.9 mL/day (3.7 mL/kg-day) to 27.2 mL/day (5.7 mL/kg-day).

The number of women included in this study was small, and these women were selected primarily from middle to high socioeconomic classes. Thus, data on human milk lipid content from this study may not be entirely representative of human milk lipid content

among the U.S. population. Also, these estimates are based on short-term data, and day-to-day variability was not characterized.

15.4.2. Mitoulas et al. (2002)—Variation in Fat, Lactose, and Protein in Human Milk Over 24 h and Throughout the First Year of Lactation

Mitoulas et al. (2002) conducted a study of healthy nursing women to determine the volume and composition of human milk during the 1st year of lactation. Nursing mothers were recruited through the Nursing Mothers' Association of Australia. All infants were completely breast-fed on demand for at least 4 months. Complementary solid food was introduced between 4 and 6 months of age. Mothers consumed their own ad libitum diets throughout the study. Seventeen mothers initially provided data for milk production and fat content, whereas lactose, protein, and energy were initially obtained from nine mothers. The number of mothers participating in the study decreased at 6 months because of the cessation of sample collection from 11 mothers, the maximum period of exclusive breast-feeding.

Milk samples were collected before and after each feed from each breast over a 24–28 hour period. Milk yield was determined by weighing the mother before and after each feed from each breast. Insensible water loss was accounted for by weighing the mother 20 minutes after the end of each feeding. The rate of water loss during this 20-minute period was used to calculate insensible water loss during the feeding. Samples of milk produced at the beginning of the feeding (foremilk) and at the end of the feeding (hindmilk) were averaged to provide the fat, protein, lactose, and energy content for each feed. In all cases the left and right breasts were treated separately; therefore, *N* represents the number of individual breasts sampled.

Table 15-19 presents mean human milk production and composition at each age interval. The mean fat, lactose, and protein contents (g/L) were 37.4 (standard error [SE] = 0.6), 61.4 (SE = 0.6), and 9.2 (SE = 0.2), respectively. Composition did not vary between left and right breasts or preferred and non-preferred breasts. Milk production was constant for the first 6 months and thereafter steadily declined. Mitoulas et al. (2002) reported a mean 24-hour milk production from both breasts was 798 (SD = 232) mL. The fat content of milk decreased between 1 and 4 months before increasing to 12 months of lactation. The concentration of protein decreased to 6 months and then remained steady. Lactose remained constant throughout the 12 months of lactation. The decrease of energy at 2 months and subsequent increase by 9 months can be attributed to changes in fat content. Assuming a density of human milk of 1.03 g/mL, the overall fat content in human milk was 3.6%. Milk production, as well as concentrations of fat, lactose, protein, and energy, differed significantly between women.

The focus of this study was on human milk composition and production, not on infant's human milk intake. The advantage of this study is that it evaluated nursing mothers for a period of 12 months. However, the number of mother-infant pairs in the study was small (17 mothers with infants) and may not be entirely representative of the U.S. population. This study accounted for insensible water loss, which increases the accuracy of the amount of human milk produced.

15.4.3. Mitoulas et al. (2003)—Infant Intake of Fatty Acids From Human Milk Over the First Year of Lactation

Mitoulas et al. (2003) conducted a study of five healthy nursing women to determine the content of fat in human milk and fat intake by infants during the 1st year of lactation. Thirty nursing mothers were recruited through the Australian Breast-feeding Association or from private healthcare facilities. All infants were completely breast-fed on demand for at least 4 months. Complementary solid food was introduced between 4 and 6 months of age. Mothers consumed their own ad libitum diets throughout the study.

Milk samples were collected before and after each feed from each breast over a 24–28 hour period. Fore- and hind-milk samples were averaged to provide the fat content for each feed. Milk yield was determined by weighing the mother before and after each feed from each breast. Insensible water loss was accounted for by weighing the mother 20 minutes after the end of each feeding. The rate of water loss during those 20 minutes was used to calculate insensible water loss during the feeding.

Table 15-20 presents changes in volume of human milk produced and milk fat content over the 1st year of lactation. The mean volumes of milk produced for both breasts combined were 813, 791, 912, 810, 677, and 505 mL/day at 1, 2, 4, 6, 9, and 12 months, respectively. The average daily production over the 12 months was 751 mL/day with a mean fat content of 35.5 g/L. Assuming a density of human milk of 1.03 g/mL, the fat content in human milk was 3.4% over the 12 month period. There was a significant difference in the proportional composition of fatty acids during the course of lactation. Table 15-21

provides average fatty acid composition during the first 12 months of lactation. Additionally, fatty acid composition varied during the course of the day.

The focus of this study was on human milk composition and production—not on infant's human milk intake. The advantage of this study is that it evaluated the human milk composition for a period of 12 months. However, the number of mother-infant pairs in the study was small (five mothers with infants) and may not be entirely representative of the entire U.S. population. This study accounted for insensible water loss, which increases the accuracy of the amount of human milk produced.

15.4.4. Arcus-Arth et al. (2005)—Breast Milk and Lipid Intake Distributions for Assessing Cumulative Exposure and Risk

Arcus-Arth et al. (2005) derived population distributions for average daily milk and lipid intakes in g/kg a day for infants 0–6 months and 0–12 months of age for infants fed according to the AAP recommendations. Lipid intakes were calculated from lipid content and milk intakes measured on the same infant (Arcus-Arth et al., 2005). Table 15-22 provides lipid intakes based on data from Dewey et al. (1991a) and Table 15-23 provides lipid intakes calculated assuming 4% lipid content and milk intake in the AAP data set. The mean measured lipid content ranged from 3.67%–4.16%, with a mean of 3.9% over the 12 month period. Arcus-Arth et al. (2005) noted that the distributions presented are intended to represent the U.S. infant population.

An advantage of this study is that it was designed to represent the population of infants who are breast-fed according to the AAP recommendations. In addition, the data used to derive the distributions were from peer-review literature and data sets supplied by the publication authors. The limitation of the study are that the data used were from mothers that were predominantly white, well-nourished, and from mid- or upper-socioeconomic status; however, human milk volume in mL/day is similar among all women except for severely malnourished women (Arcus-Arth et al., 2005). The authors noted that "although few infants are exclusively breast-fed for 12 months, the exclusively breast-fed distributions may represent a more highly exposed subpopulation of infants exclusively breast-fed in excess of 6 months." The distributions were derived from data for infants fed in accordance to AAP recommendations, and they most likely represent daily average milk intake for a significant portion of breast-fed infants today (Arcus-Arth et al., 2005).

15.4.5. Kent et al. (2006)—Volume and Frequency of Breast-Feeding and Fat Content of Breast Milk Throughout the Day

Kent et al. (2006) collected data from 71 Australian mothers who were exclusively nursing their 1–6 month-old infants. The study focused on examining the variation of milk consumed from each breast, the degree of fullness of each breast before and after feeding, and the fat content of milk consumed from each breast during daytime and nighttime feedings. The volume of milk was measured using test-weighing procedures with no correction for infant insensible water loss. On average, infants had 11 ± 3 breast-feedings per day (range = 6–18). The interval between feedings was 2 hours and 18 minutes ± 43 minutes (range = 4 minutes to 10 hours, 58 minutes). The 24-hour average human milk intake was 765 ± 164 mL/day (range = 464–1,317 mL/day). The fat content of milk ranged from 22.3 g/L to 61.6 g/L (2.2%–6.0%) with an average of 41.1 g/L (4.0%).

This study examined breast-feeding practices of volunteer mothers in Australia. Although amounts of milk consumed by Australian infants may be similar to infants in the U.S. population, results could not be broken out by smaller age groups to examine variability with age. The study provides estimates of fat content from a large number of samples.

15.5. RELEVANT STUDY ON LIPID INTAKE FROM HUMAN MILK

15.5.1. Maxwell and Burmaster (1993)—A Simulation Model to Estimate a Distribution of Lipid Intake From Human Milk During the First Year of Life

Maxwell and Burmaster (1993) used a hypothetical population of 5,000 infants between birth and 1 year of age to simulate a distribution of daily lipid intake from human milk. The hypothetical population represented both bottle-fed and breast-fed infants aged 1–365 days. A distribution of daily lipid intake was developed based on data in Dewey et al. (1991b) on human milk intake for infants at 3, 6, 9, and 12 months and human milk lipid content, and survey data in Ryan et al. (1991) on the percentage of breast-fed infants under 12 months (i.e., approximately 22%). A model was used to simulate intake among 1,113 of the 5,000 infants expected to be breast-fed. The results indicated that lipid intake among nursing infants under 12 months can be characterized by a normal distribution with a mean of

26.0 mL/day and a standard deviation of 7.2 mL/day (see Table 15-24). The model assumes that nursing infants are completely breast-fed and does not account for infants who are breast-fed longer than 1 year. Based on data collected by Dewey et al. (1991b), Maxwell and Burmaster (1993) estimated the lipid content of human milk to be 36.7 g/L at 3 months (35.6 mg/g or 3.6%), 39.2 g/L at 6 months (38.1 mg/g or 3.8%), 41.6 g/L at 9 months (40.4 mg/g or 4.0%), and 40.2 g/L at 12 months (39.0 mg/g or 3.9%).

The limitation of this study is that it provides a snapshot of daily lipid intake from human milk for breast-fed infants. These results also are based on a simulation model and there are uncertainties associated with the assumptions made. Another limitation is that lipid intake was not derived for the U.S. EPA recommended age categories. The estimated mean lipid intake rate represents the average daily intake for nursing infants under 12 months. The study also did not generate new data. A reanalysis of previously reported data on human milk intake and human milk lipid intake were provided.

15.6. OTHER FACTORS

Many factors influence the initiation, continuation, and amount of human milk intake. These factors are complex and may include considerations such as maternal nutritional status, parity, parental involvement, support from lactation consultants, mother's working status, infant's age, weight, sex, food supplementation, the frequency of breast-feeding sessions each day, the duration of breast-feeding for each event, the duration of breast-feeding during childhood, ethnicity, geographic area, and other socioeconomic factors. For example, a study conducted in the United Kingdom found that social and educational factors most influenced the initiation and continuation of lactation (Wright et al., 2006). Prenatal and postnatal lactation consultant intervention was found to be effective in increasing lactation duration and intensity (Bonuck et al., 2005).

15.6.1. Population of Nursing Infants

Breast-feeding rates in the United States have consistently increased since 1993. McDowell et al. (2008) reported that the percentage of infants who were ever breast-fed increased from 60% in 1993–1994 to 77% among infants born in 2005–2006 according to the data from the National Health and Nutrition Examination Surveys (NHANES). This exceeded the goal of 75% set in the Healthy People 2010 McDowell et al. (2008). Rates among non-Hispanic black women increased significantly from 36% in 1993–1994 to 65% in 2005–2006. Income and age had a significant impact on breast-feeding rates. Breast-feeding rates among higher income women were 74% compared to 57% among lower income women (McDowell et al., 2008).

In another study to monitor progress toward achieving the Centers for Disease Control and Prevention (CDC) *Healthy People 2010* breast-feeding objectives (initiation and duration), Scanlon et al. (2007) analyzed data from the National Immunization Survey (NIS). NIS uses random-digit dialing to survey households to survey age-eligible children, followed by a mail survey to eligible children's vaccination providers to validate the vaccination information. NIS is conducted annually by the CDC to obtain national, state, and selected urban area estimation on vaccinations rates among U.S. children ages 19–35 months. The interview response rate for years 2001–2006 ranged between 64.5% and 76.1%. Questions regarding breast-feeding were added to the NIS survey in 2001. The sample population was infants born during 2000–2004. Scanlon et al. (2007) noted that because data in their analysis are for children ages 19–35 months at the time of the NIS interview, each cross-sectional survey includes children from birth cohorts that span 3 calendar years; the breast-feeding data were analyzed by year-of-birth during 2000–2004 (birth year cohort instead if survey year).

Among infants born in 2000, breast-feeding rates were 70.9% (CI = 69.0–72.8) for the postpartum period (in hospital before discharge), 34.2% (CI = 32.2–36.2) at 6 months, and 15.7 (CI = 14.2–17.2) at 12 months. For infants born in 2004, these rates had increased to 73.8% (CI = 72.8–74.8) for the postpartum period, 41.5% (CI = 40.4–42.6) at 6 months, and 20.9 (CI = 20.0–21.8) at 12 months. Rates of breast-feeding through 3 months were lowest among black infants (19.8%), infants whose mothers were <20 years of age (16.8%), those whose mothers had a high school education or less (22.9% and 23.9%), those whose mothers were unmarried (18.8%), those who resided in rural areas (23.9%), and those whose families had an income-to-poverty ratio of <100% (23.9%). Table 15-25 shows data for exclusive breast-feeding through 3 and 6 months by socioeconomic characteristics for infants born in 2004.

Scanlon et al. (2007) noted the following limitations could affect the utility of these data: (1) breast-feeding behavior was based on retrospective self-report by mothers or other caregivers, whose responses might be subject to recall bias; (2) the NIS question defining early

postpartum breast-feeding or initiation—"Was [child's name] ever breast-fed or fed breast milk?"—collects information that might differ from the HP2010 objective for initiation; and (3) although survey data were weighted to make them representative of all U.S. children ages 19–35 months, some bias might remain. The advantage of the study is that is representative of the U.S. infant population.

In 2007, CDC released the CDC Breast-feeding Report Card, which has been updated every year since. The CDC National Immunization Program in partnership with the CDC National Center for Health Statistics conducts the NIS within all 50 states, the District of Columbia, and selected geographic areas within the states. Five breast-feeding goals are in the *Healthy People 2010* report. The Breast-feeding Report Card presents data for each state for the following categories of infants: ever breast-fed, breast-fed at 6 months, breast-fed at 12 months, exclusive breast-feeding through 3 months, and exclusive breast-feeding through 6 months (CDC, 2009). These indicators are used to measure a state's ability to promote, protect, and support breast-feeding. Table 15-26 presents these data for the estimated percentage of infants born in 2006. The advantage of this report is that it provides data for each state and is representative of the U.S. infant population.

Analysis of breast-feeding practices in other developing countries also was found in the literature. Marriott et al. (2007) researched feeding practices in developing countries in the first year of life, based on 24-hour recall data. Marriott et al. (2007) used secondary data from the Demographic and Health Surveys (DHS) for more than 35,000 infants in 20 countries. This survey has been conducted since 1986 and was expanded to provide a standardized survey instrument that can be used by developing countries to collect data on maternal-infant health and intake and household variables, as well as to build national health statistics (Marriott et al., 2007). The analysis was based on the responses of the survey mothers for questions on whether they were currently breast-feeding and had fed other liquids and solid foods to their infants in the previous 24 hours. The data incorporated were from between 1999 and 2003. Marriott et al. (2007) selected the youngest infant (i.e., less than 1 year old) in each of the families; multiples were included such as twins or triplets. Separate analyses were conducted for infants less than 6 months old and infants 6 months and older, but less than 12 months old. Food and liquid variables other than water and infant formulas were collapsed into broader food categories for cross-country comparisons (Marriott et al., 2007). Tinned, powdered, and any other specified animal milks were collapsed. In addition, all other liquids such as herbal teas, fruit juices, and sugar water (excluding unique country-specific liquids) were collapsed into other liquids and the 10 types of solid food groups into an any-solid-foods category (Marriott et al., 2007). Data were pooled from the 20 countries to provide a large sample size and increase statistical power. Table 15-27 and Table 15-28 present the percentage of mothers who were currently breast-feeding and separately had fed their infants other liquids or solid food by age groups. Table 15-29 presents the pooled data summary for the study period. The current breast-feeding was consistent across countries for both age groups; the countries that reported the highest percentages of current breast-feeding for the 0- to 6-month-old infants also reported the highest percentages in the 6- to 12-month-old infants. Pooled data show that 96.6% of the 0- to 6-month-old infants and 87.9% of the 6- to 12-month-old infants were breast-feeding. Feeding of other fluids was lowest in the 0- to 6-month-old infants, with the percentage feeding water the highest of this category. The percentage of mothers feeding commercial infant formulas was the lowest in most countries.

There are other older studies that analyze ethnic and racial differences in breast-feeding practices. Li and Grummer-Strawn (2002) investigated ethnic and racial disparities in lactation in the United States using data from the NHANES III that was conducted between 1988 and 1994. NHANES II participants were ages 2 months and older. The data were collected during a home interview from a parent or a proxy respondent for the child (Li and Grummer-Strawn, 2002). The sample population consisted of children 12–71 months of age at time of interview. The NHANES III response rate for children participating was approximately 94% (Li and Grummer-Strawn, 2002). Data for a total of 2,863 exclusively breast-fed, 6,140 ever breast-fed, and 6,123 continued breast-fed children were included in the analysis (Li and Grummer-Strawn, 2002). The percentage of children ever breast-fed was 60% among non-Hispanic Whites, 26% among non-Hispanic Blacks, and 54% among Mexican Americans. This percentage decreased to 27%, 9%, and 23% respectively by 6 months. The percentage of children fed exclusively human milk at 4 months also was significantly lower for Blacks at 8.5%, compared to 22.6% for Whites and 14.1% for Mexican Americans. The racial and ethnic differences in proportion of children ever breast-fed is presented in Table 15-30, the proportion of children who received any breast milk at 6 months are presented in

Table 15-31, and the proportion of children exclusively breast-fed at 4 months is presented in Table 15-32.

Li and Grummer-Strawn (2002) noted that there may have been some lag time between birth and the time of the interview. This may have caused misclassification if the predicator variables changed considerably between birth and the time of interview. Also, NHANES III did not collect information on maternal education. Instead, the educational level of the household head was used as a proxy. The advantage of this study is that it is representative of the U.S. children's population.

Data from some older studies provide historical information on breast-feeding practices in the United States. These data are provided in this chapter to show trends in the U.S. population. In 1991, the National Academy of Sciences (NAS) reported that the percentage of breast-feeding women has changed dramatically over the years (NAS, 1991). The Ross Products Division of Abbott Laboratories conducted a large national mail survey in 1995 to determine patterns of breast-feeding during the first 6 months of life. The Ross Laboratory Mothers' Survey was first developed in 1955 and has been expanded to include many more infants. Before 1991, the survey was conducted on a quarterly basis, and approximately 40,000 to 50,000 questionnaires were mailed each quarter (Ryan, 1997). Beginning in 1991, the survey was conducted monthly; 35,000 questionnaires were mailed each month. Over time, the response rate has been consistently in the range of 50 ± 5%. In 1989 and 1995, 196,000 and 720,000 questionnaires were mailed, respectively. Ryan (1997) reported rates of breast-feeding through 1995 and compared them with those in 1989.

The survey demonstrates increases in both the initiation of breast-feeding and continued breast-feeding at 6 months of age between 1989 and 1991. Table 15-33 presents the percentage of breast-feeding in hospitals and at 6 months of age by selected demographic characteristics. In 1995, the incidence of breast-feeding at birth and at 6 months for all infants was approximately 59.7% and 21.6%, respectively. The largest increases in the initiation of breast-feeding between 1989 and 1995 occurred among women who were black, were less than 20 years of age, earned less than $10,000 per year, had no more than a grade school education, were living in the South Atlantic region of the United States, had infants of low birth weight, were employed full time outside the home at the time they received the survey, and participated in the Women, Infants, and Children program (WIC). In 1995, as in 1989, the initiation of breast-feeding was highest among women who were more than 35 years of age, earned more than $25,000 per year, were college-educated, did not participate in the WIC program, and were living in the Mountain and Pacific regions of the United States.

Data on the actual length of time that infants continue to breast-feed beyond 5 or 6 months were limited (NAS, 1991). However, Maxwell and Burmaster (1993) estimated that approximately 22% of infants under 1 year are breast-fed. This estimate was based on a reanalysis by Ryan et al. (1991) of survey data collected by Ross Laboratories (Maxwell and Burmaster, 1993). Studies also have indicated that breast-feeding practices may differ among ethnic and socioeconomic groups and among regions of the United States. More recently, the Ross Products Division of Abbott Laboratories reported the results of their ongoing *Ross Mothers Survey* in 2003 (Abbott Labs, 2003). Table 15-34 presents the percentages of mothers who breast-feed, based on ethnic background and demographic variables. These data update the values presented in the NAS (1991) report.

15.6.2. Intake Rates Based on Nutritional Status

Information on differences in the quality and quantity of human milk on the basis of ethnic or socioeconomic characteristics of the population is limited. Lönnerdal et al. (1976) studied human milk volume and composition (nitrogen, lactose, proteins) among underprivileged and privileged Ethiopian mothers. No significant differences were observed between the data for these two groups. Similar data were observed for well-nourished Swedish mothers. Lönnerdal et al. (1976) stated that these results indicate that human milk quality and quantity are not affected by maternal malnutrition. However, Brown et al. (1986b; 1986a) noted that the lactational capacity and energy concentration of marginally nourished women in Bangladesh were "modestly less than in better nourished mothers." Human milk intake rates for infants of marginally nourished women in this study were 690 ± 122 g/day at 3 months, 722 ± 105 g/day at 6 months, and 719 ± 119 g/day at 9 months (Brown et al., 1986a). Brown et al. (1986a) observed that human milk from women with larger measurements of arm circumference and triceps skinfold thickness had higher concentrations of fat and energy than mothers with less body fat. Positive correlations between maternal weight and milk fat concentrations also were observed. These results suggest that milk composition may be affected by maternal nutritional status.

15.6.3. Frequency and Duration of Feeding

Hofvander et al. (1982) reported on the frequency of feeding among 25 bottle-fed and 25 breast-fed infants at ages 1, 2, and 3 months. The mean number of meals for these age groups was approximately five meals a day (see Table 15-35). Neville et al. (1988) reported slightly higher mean feeding frequencies. The mean number of meals per day for exclusively breast-fed infants was 7.3 at ages 2–5 months and 8.2 at ages 2 weeks to 1 month. Neville et al. (1988) reported that, for infants between the ages of 1 week and 5 months, the average duration of a breast-feeding session is 16–18 minutes.

Buckley (2001) studied the breast-feeding patterns, dietary intake, and growth measurement of children who continued to breast-feed beyond 1 year of age. The sample was 38 mother-child pairs living in the Washington, DC, area. The criteria for inclusion in the study were that infants or their mothers had no hospitalization of either subject 3 months prior to the study and that the mother was currently breast-feeding a 1-year-old or older child (Buckley, 2001). The participants were recruited through local medical consultants and the La Leche League members. The children selected as the final study subjects consisted of 22 boys and 16 girls with ages ranging from 12 to 43 months old. The data were collected using a 7-day breast-feeding diary. The frequency and length of breast-feeding varied with the age of the child (Buckley, 2001). The author noted a statistically significant difference in the mean number of breast-feeding episodes each day and the average total minutes of breast-feeding between the 1-, 2-, and 3-year-old groups. Table 15-36 provides the comparison of breast-feeding patterns between age groups. An advantage of this study is that the frequency and duration data are based primarily on a 7-day diary and some dietary recall. Limitations of the study are the small sample size and that it is limited to one geographical area.

15.7. REFERENCES FOR CHAPTER 15

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Table 15-7. Daily Intakes of Human Milk

Age	Number of Infants	Intake	
		Mean ± SD (mL/day) [a]	Intake Range (mL/day)
Completely Breast-fed			
1 month	11	600 ± 159	426–989
3 months	2	833	645–1,000
6 months	1	682	616–786
Partially Breast-fed			
1 month	4	485 ± 79	398–655
3 months	11	467 ± 100	242–698
6 months	6	395 ± 175	147–684
9 months	3	<554	451–732

[a] Data expressed as mean ± standard deviation.

Source: Pao et al. (1980).

Table 15-8. Human Milk Intakes for Infants Aged 1–6 Months

Age	Number of Infants	Intake	
		Mean ± SD (mL/day)	Intake Range (mL/day)
1 month	16	673 ± 192	341–1,003
2 months	19	756 ± 170	449–1,055
3 months	16	782 ± 172	492–1,053
4 months	13	810 ± 142	593–1,045
5 months	11	805 ± 117	554–1,045
6 months	11	896 ± 122	675–1,096

Source: Dewey and Lönnerdal (1983).

Table 15-9. Human Milk Intake Among Exclusively Breast-Fed Infants During the First 4 Months of Life

Age	Number of Infants	Intake (mL/day)[a] Mean ± SD	Intake (mL/kg-day)[a] Mean ± SD	Feedings/Day	Body Weight[b] (kg)
1 month	37	729 ± 126	154 ± 23	8.3 ± 1.9	4.7
2 months	40	704 ± 127	125 ± 18	7.2 ±1.9	5.6
3 months	37	702 ± 111	114 ± 19	6.8 ± 1.9	6.2
4 months	41	718 ± 124	108 ± 17	6.7 ± 1.8	6.7

[a] Values reported by the author in units of g/day and g/kg-day were converted to units of mL/day and mL/kg-day by dividing by 1.03 g/mL (density of human milk).

[b] Calculated by dividing human milk intake (g/day) by human milk intake (g/kg-day).

SD = Standard deviation.

Source: Butte et al. (1984).

Table 15-10. Human Milk Intake During a 24-Hour Period

Age (days)	Number of Infants	Intake (mL/day)[a]		Intake by Age Category (mL/day)[a, b]
		Mean ± SD	Range	
1	6	43 ± 68	–30–145[c]	511 ± 220
2	9	177 ± 83	43–345	
3	10	360 ± 149	203–668	
4	10	438 ± 171	159–674	
5	11	483 ± 125	314–715	
6	9	493 ± 162	306–836	
7	7	556 ± 162	394–817	
8	8	564 ± 154	398–896	
9	9	563 ± 74	456–699	
10	9	569 ± 128	355–841	
11	8	597 ± 163	386–907	
14	9	634 ± 150	404–895	
21	10	632 ± 82	538–763	
28	13	748 ± 174	481–1,111	
35	12	649 ± 114	451–903	679 ± 105
42	12	690 ± 108	538–870	
49	10	688 ± 112	543–895	
56	12	674 ± 95	540–834	
90	10	713 ± 111	595–915	713 ± 111
120	12	690 ± 97	553–822	690 ± 97
150	12	814 ± 130	668–1,139	814 ± 130
180	13	744 ± 117	493–909	744 ± 117
210	12	700 ± 150	472–935	700 ± 150
240	9	604 ± 204	280–973	604 ± 204
270	12	600 ± 214	217–846	600 ± 214
300	11	535 ± 227	125–868	535 ± 227
330	8	538 ± 233	117–835	538 ± 233
360	8	391 ± 243	63–748	391 ± 243

[a] Values reported by the author in units of g/day were converted to units of mL/day by dividing by 1.03 g/mL (density of human milk).

[b] Multiple data sets were combined by producing simulated data sets fitting the known mean and SD for each age, compositing the data sets to correspond to age groups of 0 to <1 month and 1 to <2 months, and calculating new means and SD's on the composited data.

[c] Negative value due to insensible weight loss correction.

SD = Standard deviation.

Source: Neville et al. (1988).

Table 15-11. Human Milk Intake Estimated by the Darling Study

Age	Number of Infants	Intake (mL/day)[a] Mean ± SD
3 months	73	788 ± 129
6 months	60	747 ± 166
9 months	50	627 ± 211
12 months	42	435 ± 244

[a] Values reported by the author in units of g/day were converted to units of mL/day by dividing by 1.03 g/mL (density of human milk).
SD = Standard deviation.

Source: Dewey et al. (1991b).

Table 15-12. Mean Breast-Fed Infants Characteristics[a]

	Boys (*N* = 14)	Girls (*N* = 26)
Ethnicity (White, Black, Hispanic, Asian) (*N*)	10/1/2/1	21/1/3/1
Duration of Breast-Feeding (days)	315 ± 152	362 ± 190
Duration of Formula Feeding (days)	184 ± 153	105 ± 121
Age at Introduction of Formula (months)	6.2 ± 2.9	5.2 ± 2.3
Age at Introduction of Solids (months)	5.0 ± 1.5	5.0 ± 0.09
Age at Introduction of Cow's Milk (months)	13.1 ± 3.1	12.5 ± 3.8

[a] Mean ± standard deviation.
N = Number of infants.

Source: Butte et al. (2000).

Table 15-13. Mean Human Milk Intake of Breast-Fed Infants (mL/day)[a]

Age Group	Boys	Girls
3 months	790 ± 172 (*N* = 14)	694 ± 108 (*N* = 26)
6 months	576 ± 266 (*N* = 12)	678 ± 250 (*N* = 18)
12 months	586 ± 286 (*N* = 2)	370 ± 260 (*N* = 11)
24 months	–	–

[a] 3-day average; values reported by the author in units of g/day were converted to units of mL/day by dividing by 1.03 g/mL (density of human milk); mean ± standard deviation.
N = Number of infants.
– = Not quantitated.

Source: Butte et al. (2000).

Table 15-14. Feeding Practices by Percent of Infants

Infants	Age					
	3 months	6 months	9 months	12 months	18 months	24 months
Percentage						
Infants Still Breast-Fed	100	80	58	38	25	5
Breast-Fed Infants Given Formula	0	40	48	30	10	2
Formula-Fed Infants Given Breast Milk	100	100	94	47	6	0
Use of Cow's Milk for Breast-Fed Infants	–	–	8	65	82	88
Use of Cow's Milk for Formula-Fed Infants	–	–	28	67	89	92

Source: Butte et al. (2000).

Table 15-15. Body Weight of Breast-Fed Infants[a]

Age	Weight (kg)	
	Boys	Girls
0.5 months	3.9 ± 0.4 (*n* = 14)	3.7 ± 0.5 (*n* = 19)
3 months	6.4 ± 0.6 (*n* = 14)	6.0 ± 0.6 (*n* = 19)
6 months	8.1 ± 0.8 (*n* = 14)	7.5 ± 0.6 (*n* = 18)
9 months	9.3 ± 1.0 (*n* = 14)	8.4 ± 0.6 (*n* = 19)
12 months	10.1 ± 1.1 (*n* = 14)	9.2 ± 0.7 (*n* = 19)
18 months	11.6 ± 1.2 (*n* = 14)	10.7 ± 1.0 (*n* = 19)
24 months	12.7 ± 1.3 (*n* = 12)	11.8 ± 1.1 (*n* = 19)

[a] Mean ± standard deviation.
n = Number of infants.

Source: Butte et al. (2000).

Table 15-16. AAP Data Set Milk Intake Rates at Different Ages

Age	Mean (mL/kg-day)[a]	SD (mL/kg-day)[a]	CV	Skewness Statistic[b]	*N*
7 days	143	37	0.26	0.598	10
14 days	156	40	0.26	–1.39	9
30 days	150	24	0.16	0.905	25
60 days	144	22	0.15	0.433	25
90 days	127	18	0.14	–0.168	108
120 days	112	18	0.16	0.696	57
150 days	100	21	0.21	–1.077	26
180 days	101	20	0.20	–1.860	39
210 days	75	25	0.33	–0.844	8
270 days	72	23	0.32	–0.184	57
360 days	47	27	0.57	0.874	42

[a] Values reported by the author in units of g/kg-day were converted to units of mL/kg-day by dividing by 1.03 g/mL (density of human milk).
[b] Statistic/SE: -2 < Statistic/SE < +2 suggests a normal distribution.
SD = Standard deviation.
CV = Coefficient of variation.
N = Number of infants.

Source: Arcus-Arth et al. (2005).

Table 15-17. Average Daily Human Milk Intake (mL/kg-day)[a]

Averaging Period	Mean (SD)	Population Percentile							
		5	10	25	50	75	90	95	99
AAP 0 to 6 months									
Method 1	126 (21)	92	99	112	126	140	152	160	174
Method 2	123 (7)	112	114	118	123	127	131	133	138
AAP 0 to 12 months									
Method 1	98 (22)	61	69	83	98	113	127	135	150
Method 2	99 (5)	90	92	95	99	102	105	107	110
EBF 0 to 12 months	110 (21)	75	83	95	110	124	137	144	159
General Pop.									
0 to 6 months	79	0	0	24	92	123	141	152	170
0 to 12 months	51	0	0	12	49	85	108	119	138

[a] Values reported by the author in units of g/kg-day were converted to units of mL/kg-day by dividing by 1.03 g/mL (density of human milk).
AAP = American Academy of Pediatrics.
EBF = Exclusively breast-fed.

Source: Arcus-Arth et al. (2005).

Table 15-18. Lipid Content of Human Milk and Estimated Lipid Intake Among Exclusively Breast-Fed Infants

Age (months)	Number of Observations	Lipid Content (mg/g) Mean ± SD	Lipid Content %[a]	Lipid Intake (mL/day)[b] Mean ± SD	Lipid Intake (mL/kg-day)[b] Mean ± SD
1	37	36.2 ± 7.5	3.6	27 ± 8	5.7 ± 1.7
2	40	34.4 ± 6.8	3.4	24 ± 7	4.3 ± 1.2
3	37	32.2 ± 7.8	3.2	23 ± 7	3.7 ± 1.2
4	41	34.8 ± 10.8	3.5	25 ± 8	3.7 ± 1.3

[a] Percents calculated from lipid content reported in mg/g.
[b] Values reported by the author in units of g/day and g/kg-day were converted to units of mL/day and mL/kg-day by dividing by 1.03 g/mL (density of human milk).

Source: Butte et al. (1984).

Table 15-19. Human Milk Production and Composition During the First 12 Months of Lactation[a]

Age Group (months)	Volume, per Breast (mL/24 hours)			Fat (g/L)			Lactose (g/L)			Protein (g/L)			Energy (kJ/mL)		
	Mean	SE	*N*	Mean	SE	*N*	Mean	SE	*N*	Mean	SE	*N*	Mean	SE	*N*
1	416	24	34	39.9	1.4	34	59.7	0.8	18	10.5	0.4	18	2.7	0.06	18
2	408	23	34	35.2	1.4	34	60.4	1.1	18	9.6	0.4	18	2.5	0.06	18
4	421	20	34	35.4	1.4	32	62.6	1.3	16	9.3	0.4	18	2.6	0.09	16
6	413	25	30	37.3	1.4	28	62.5	1.7	16	8.0	0.4	16	2.6	0.09	16
9	354	47	12	40.7	1.7	12	62.8	1.5	12	8.3	0.5	12	2.8	0.09	12
12	252	51	10	40.9	3.3	10	61.4	2.9	10	8.3	0.6	10	2.8	0.14	10
1 to 12	399	11	154	37.4	0.6	150	61.4	0.6	90	9.2	0.2	92	2.7	0.04	90

[a] Infants were completely breast-fed to 4 months and complementary solid food was introduced between 4 and 6 months.
SE = Standard error.
N = Number of individual breasts.

Source: Mitoulas et al. (2002).

Table 15-20. Changes in Volume of Human Milk Produced and Milk Fat Content During the First Year of Lactation[a]

Age Group (months)	*N*	Volume, Left Breast (mL/day)		Volume, Right Breast (mL/day)		Fat, Left Breast (g/L)		Fat, Right Breast (g/L)	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
1	5	338	52	475	69	38	1.5	38	2.6
2	5	364	52	427	42	31	2.2	30	2.9
4	5	430	51	482	58	32	3.3	29	2.6
6	5	373	75	437	56	33	2.5	33	2.5
9	5	312	65	365	94	43	2.2	38	3.3
12	5	203	69	302	85	40	4.8	42	5.0
1 to 12	30	337	26	414	28	36	1.4	35	1.5
Statistical significance: *P*		NS		NS		0.004		0.008	

[a] Infants were completely breast-fed to 4 months, and complementary solid food was introduced between 4 and 6 months.

N = Number of mothers.
SE = Standard error.
NS = No statistical difference.
P = Probability.

Source: Mitoulas et al. (2003).

Table 15-21. Changes in Fatty Acid Composition of Human Milk During the First Year of Lactation (g/100 g total fatty acids)

Fatty Acid	1 month		2 months		4 months		6 months		9 months		12 months	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Medium-Chain Saturated	14.2	0.4	13.9	0.6	12.0	0.5	11.5	0.2	14.1	0.3	17.0	0.4
Odd-Chain Saturated	0.9	0.01	0.9	0.02	0.8	0.02	0.8	0.03	0.8	0.02	0.8	0.02
Long-Chain Saturated	34.1	0.3	33.7	0.3	32.8	0.3	31.8	0.6	31.4	0.6	33.9	0.6
Mono-Unsaturated	37.5	0.2	33.7	0.4	38.6	0.5	37.5	0.5	37.3	0.5	33.0	0.5
Trans	2.0	0.08	2.2	0.1	2.2	0.09	4.6	0.02	1.7	0.2	1.8	0.09
Poly-Unsaturated	12.7	0.2	9.5	0.2	11.8	0.4	13.4	0.6	8.0	0.1	6.7	0.03

SE = Standard error.

Source: Mitoulas et al. (2003).

Table 15-22. Comparison Daily Lipid Intake Based on Lipid Content Assumptions (mL/kg-day)[a, b]

Lipid Content Used in Calculation	Mean	Population Percentile							
		5	10	25	50	75	90	95	99
Measured Lipid Content[c]	3.6	2.0	2.3	2.9	3.6	4.3	4.9	5.2	5.9
4% Lipid Content[d]	3.9	2.5	2.8	3.3	3.8	4.4	4.9	5.2	5.8

[a] Values reported by the author in units of g/kg-day were converted to units of mL/kg-day by dividing by 1.03 g/mL (density of human milk).
[b] Estimates based on data from Dewey et al. (1991a).
[c] Lipid intake derived from lipid content and milk intake measurements.
[d] Lipid intake derived using 4% lipid content value and milk intake.

Source: Arcus-Arth et al. (2005).

Table 15-23. Distribution of Average Daily Lipid Intake (mL/kg-day) Assuming 4% Milk Lipid Content[a]

	Mean	Population Percentile							
		5	10	25	50	75	90	95	99
AAP Infants 0–12 months	3.9	2.4	2.8	3.3	3.9	4.5	5.1	5.4	6.0

[a] Values reported by the author in units of g/kg-day were converted to units of mL/kg-day by dividing by 1.03 g/mL (density of human milk).
AAP = American Academy of Pediatrics.

Source: Arcus-Arth et al. (2005).

Table 15-24. Predicted Lipid Intakes for Breast-Fed Infants Under 12 Months of Age

Statistic	Value
Number of Observations in Simulation	1,113
Minimum Lipid Intake	1.0 mL/day[a]
Maximum Lipid Intake	51.0 mL/day[a]
Arithmetic Mean Lipid Intake	26.0 mL/day[a]
Standard Deviation Lipid Intake	7.2 mL/day[a]

[a] Values reported by the author in units of g/day were converted to units of mL/day by dividing by 1.03 g/mL (density of human milk).

Source: Maxwell and Burmaster (1993).

Table 15-25. Socioeconomic Characteristics of Exclusively Breast-Fed Infants Born in 2004

	Percent of Exclusive Breast-Feeding Infants through 3 and 6 Months			
	3 months		6 months	
Characteristic	%	95% CI	%	95% CI
U.S. Overall (*N* = 17,654)	30.5	29.4–31.6	11.3	10.5–12.1
Infant Sex				
Male	30.7	29.1–32.3	10.8	9.8–11.8
Female[a]	30.3	28.7–31.9	11.7	10.5–12.9
Race/Ethnicity (child)				
Hispanic	30.8	28.3–33.3	11.5	9.7–13.3
White, non-Hispanic[a]	33.0	31.6–34.4	11.8	10.9–12.7
Black, non-Hispanic	19.8[b]	17.0–22.6	7.3[b]	5.5–9.1
Asian, non-Hispanic	30.6	25.0–36.2	14.5	10.0–19.0
Other	29.3	24.9–33.7	12.2	9.2–15.2
Maternal Age (years)				
<20	16.8[b]	10.3–23.3	6.1[b]	1.5–10.7
20 to 29	26.2[b]	24.4–28.0	8.4[b]	7.3–9.5
≥30[a]	34.6	33.2–36.0	13.8	12.7–14.9
Household Head Education				
<High school	23.9[b]	21.0–26.8	9.1[b]	7.1–11.1
High school	22.9[b]	20.9–24.9	8.2[b]	7.0–9.4
Some college	32.8[b]	30.3–35.3	12.3[b]	10.2–14.4
College graduate[a]	41.5	39.7–43.3	15.4	14.1–16.7
Marital Status				
Married[a]	35.4	34.0–36.8	13.4	12.4–14.4
Unmarried	18.8[b]	16.9–20.7	6.1[b]	5.0–7.2
Residence				
MSA, center city[a]	30.7	29.0–32.4	11.7	10.5–12.9
MSA, non-center city	32.8	30.9–34.7	12.1	10.8–13.4
Non-MSA	23.9[b]	21.8–26.0	8.2[b]	6.9–9.5
Poverty income ratio (%)				
<100	23.9[b]	21.6–26.2	8.3[b]	6.9–9.7
100 to <184	26.6[b]	23.8–29.4	8.9[b]	7.2–10.6
185 to <349	33.2[b]	30.9–35.5	11.8[b]	10.3–13.3
≥350[a]	37.7	35.7–39.7	14.0	12.6–15.4

[a] Referent group.
[b] $p < 0.05$ by chi-square test, compared with referent group.
N = Number of infants.
MSA = Metropolitan statistical area.

Source: Scanlon et al. (2007).

Table 15-26. Geographic-Specific Breast-Feeding Percent Rates Among Children Born in 2006[a]

State	Ever Breast-Fed	Breast-Fed at 6 Months	Breast-Fed at 12 Months	Exclusive Breast-Feeding through 3 Months	Exclusive Breast-Feeding through 6 Months
U.S. National	73.9	43.4	22.7	33.1	13.6
Alabama	58.8	26.6	11.4	24.2	6.3
Alaska	88.5	48.9	26.2	45.5	16.9
Arizona	76.5	45.3	22.3	29.7	11.9
Arkansas	61.5	26.9	10.6	23.6	6.3
California	84.7	53.0	31.1	42.4	18.6
Colorado	82.5	59.5	30.5	49.2	22.6
Connecticut	74.9	41.9	23.3	35.1	14.4
Delaware	66.7	32.8	15.4	28.1	7.5
Dist of Columbia	69.6	45.6	20.2	31.3	13.3
Florida	75.7	37.2	18.2	30.7	11.9
Georgia	62.5	36.4	18.1	28.0	14.8
Hawaii	88.2	56.3	35.0	44.9	22.4
Idaho	79.8	55.1	25.3	46.7	17.7
Illinois	69.5	38.7	15.9	28.5	11.9
Indiana	71.1	37.2	18.9	28.9	10.6
Iowa	68.1	33.2	15.8	32.3	10.6
Kansas	78.1	43.8	23.6	36.0	16.8
Kentucky	53.6	28.9	15.8	27.2	9.4
Louisiana	49.1	20.7	9.9	17.8	5.0
Maine	75.0	45.7	26.0	38.7	18.1
Maryland	76.4	43.3	25.4	28.5	10.1
Massachusetts	78.2	44.7	24.5	39.0	13.5
Michigan	64.8	31.2	14.4	23.5	10.7
Minnesota	79.9	51.6	24.7	39.8	15.0
Mississippi	48.3	20.1	8.7	16.8	4.6
Missouri	65.3	33.1	14.9	24.8	8.5
Montana	82.7	56.8	30.6	40.8	20.5

Table 15-26. Geographic-Specific Breast-Feeding Percent Rates Among Children Born in 2006[a] (continued)

State	Ever Breast-Fed	Breast-Fed at 6 Months	Breast-Fed at 12 Months	Exclusive Breast-Feeding through 3 Months	Exclusive Breast-Feeding through 6 Months
Nebraska	76.8	46.2	22.6	31.7	11.9
Nevada	79.3	45.3	22.5	31.8	9.7
New Hampshire	78.4	55.1	30.5	42.6	20.6
New Jersey	81.4	53.0	27.4	29.7	13.2
New Mexico	72.6	42.2	25.7	33.2	14.0
New York	76.4	49.4	28.9	24.9	9.6
North Carolina	66.9	36.7	18.9	30.2	13.1
North Dakota	71.1	37.6	20.6	33.7	11.1
Ohio	58.5	29.7	12.0	22.4	9.1
Oklahoma	65.6	27.4	12.4	30.6	8.4
Oregon	91.4	63.0	37.0	56.6	20.8
Pennsylvania	67.6	35.8	19.4	29.3	10.1
Rhode Island	75.4	40.4	19.8	31.8	8.7
South Carolina	61.3	30.4	13.9	25.5	9.6
South Dakota	76.8	47.5	22.1	36.5	17.6
Tennessee	58.8	37.9	14.8	28.2	12.8
Texas	78.2	48.7	25.3	34.2	14.2
Utah	92.8	69.5	33.9	50.8	24.0
Vermont	80.1	59.5	38.4	49.2	23.5
Virginia	79.7	48.3	25.8	38.7	18.8
Washington	86.4	58.0	35.0	48.8	25.3
West Virginia	58.8	27.2	12.6	21.3	8.4
Wisconsin	75.3	48.6	25.9	45.2	16.8
Wyoming	84.2	50.8	26.7	46.2	16.8

[a] Exclusive breast-feeding information is from the 2006 NIS survey data only and is defined as ONLY breast milk: no solids, no water, no other liquids.

Source: CDC (2009).

Table 15-27. Percentage of Mothers in Developing Countries by Feeding Practices for Infants 0–6 Months Old[a]

Country	Breast-Feeding	Water	Milk	Formula	Other Liquids	Solid Foods
Armenia	86.1	62.7	22.9	13.1	48.1	23.9
Bangladesh	99.6	30.2	13.6	5.3	19.7	20.3
Cambodia	98.9	87.9	2.1	3.3	6.7	16.6
Egypt	95.5	22.9	11.1	4.3	27.6	13.2
Ethiopia	98.8	26.3	19	0	10.8	5.3
Ghana	99.6	41.9	6.7	3.5	4.3	15.6
India	98.1	40.2	21.2	0	7.1	6.5
Indonesia	92.8	37	0.7	24.2	8.7	43
Jordan	92.4	58.5	3	25.1	13.8	20.2
Kazakhstan	94.4	53.7	21.4	8.2	37.4	15.4
Kenya	99.7	60	35.1	4.8	35.9	46.3
Malarwi	100	46	1.4	1.7	5.2	42.3
Nambia	95.3	65.4	0	0	17.9	33.4
Nepal	100	23.3	12.3	0	2.8	9.3
Nigeria	99.1	78.2	9.2	12.7	17.9	18.5
Philippines	80.5	53.4	4.4	30	12.4	16.8
Uganda	98.7	15.1	20.3	1.5	10.3	11.4
Vietnam	98.7	45.9	16.9	0.8	8.9	18.7
Zamibia	99.6	52.6	2.1	2.7	6.7	31.2
Zimbabwe	100	63.9	1.6	3.2	9	43.7
Pooled	96.6	45.9	11.9	9	15.1	21.9

[a] Percentage of mothers who stated that they currently breast-feed and separately had fed their infants four categories of liquid or solid food in the past 24 hours by country for infants age 0 to 6 months old.

Source: Marriott et al. (2007).

Table 15-28. Percentage of Mothers in Developing Countries by Feeding Practices for Infants 6–12 Months Old[a]

Country	Breast-Feeding	Water	Milk	Formula	Other Liquids	Solid Foods
Armenia	53.4	91.1	56.9	11.6	85.3	88.1
Bangladesh	96.2	87.7	29.8	10.1	21.9	65.2
Cambodia	94.4	97.5	3.7	6.7	29	81
Egypt	89.1	85.9	36.8	16.7	48.5	75.7
Ethiopia	99.4	69.2	37.6	0	23.9	54.7
Ghana	99.3	88.8	14.6	9.6	23.9	71.1
India	94.9	81.4	45	0	25.2	44.1
Indonesia	84.8	85.4	4.9	38.8	35.4	87.9
Jordan	65.7	99.3	24.3	28.8	57.7	94.9
Kazakhstan	81.2	74.3	85.4	11.4	91.8	85.9
Kenya	96.5	77.7	58.7	6	56.4	89.6
Malarwi	99.4	93.5	5.9	3.2	31.2	94.9
Nambia	78.7	91.9	0	0	42.7	79.5
Nepal	98.8	84.3	32	0	15.8	71.5
Nigeria	97.8	91.6	14.4	13.4	27.4	70.4
Philippines	64.4	95.1	12.2	47.1	31	88
Uganda	97.4	65.9	32.1	1.6	56.2	82.1
Vietnam	93.2	95	36.1	5.3	37.9	85.8
Zamibia	99.5	91.7	8.2	5	25.9	90.2
Zimbabwe	96.7	92.5	8.7	2.4	49.9	94.8
Pooled	87.9	87.4	29.6	15.1	41.6	80.1

[a] Percentage of mothers who stated that they currently breast-feed and separately had fed their infants four categories of liquid or solid food in the past 24 hours by country for infants age 6 to 12 months old.

Source: Marriott et al. (2007).

Table 15-29. Population Weighted Averages of Mothers Who Reported Selected Feeding Practices During the Previous 24 Hours

Feeding Practices	Infant Age	
	0–6 months	6–12 months
	Percentage (weighted *N*)	
Current Breast-Feeding	96.6 (22,781)	87.9 (18,944)
Gave Infant:		
Water	45.9 (10,767)	87.4 (18,663)
Tinned, Powdered, or Other Milk	11.9 (2,769)	29.6 (6,283)
Commercial Formula	9.0 (1,261)	15.1 (1,911)
Other Liquids	15.1 (3,531)	41.6 (8,902)
Any Solid Food	21.9 (5,131)	80.1 (17,119)

N = Number of infants.

Source: Marriott et al. (2007).

Table 15-30. Racial and Ethnic Differences in Proportion of Children Ever Breast-Fed, NHANES III (1988–1994)

	Non-Hispanic White			Non-Hispanic Black			Mexican American			Absolute Difference (%, SE)[a]			
										White vs. Black		White vs. Mexican American	
Characteristic	*N*	%	(SE)	*N*	%	(SE)	*N*	%	(SE)	%	(SE)	%	(SE)
All Infants	1,869	60.3	2.0	1,845	25.5	1.4	2,118	54.4	1.9	34.8	(2.0)[b]	6.0	(2.3)[a]
Infant Sex													
Male	901	60.4	2.6	913	24.4	1.6	1,033	53.8	1.8	35.9	(2.9)[b]	6.6	(2.8)[a]
Female	968	60.3	2.3	932	26.7	1.9	1,085	54.9	2.9	33.7	(2.6)[b]	5.4	(3.4)[c]
Infant Birth Weight (g)													
<2,500	118	40.1	5.3	221	14.9	2.6	165	34.1	3.9	25.1	(5.8)[b]	5.9	(6.4)[c]
≥2,500	1,738	62.1	2.1	1,584	26.8	1.6	1,838	55.7	2.0	35.3	(2.1)[b]	6.4	(2.5)[a]
Maternal Age (years)													
<20	175	33.7	4.4	380	13.1	2.1	381	43.7	3.0	20.6	(4.8)[b]	−10	(5.1)[c]
20–24	464	48.3	3.0	559	22.0	2.0	649	54.8	2.6	26.4	(3.7)[b]	−6.4	(4.2)[c]
25–29	651	65.4	2.2	504	30.6	2.5	624	56.9	3.3	34.8	(3.1)[b]	8.6	(4.0)[a]
≥30	575	71.9	2.7	391	36.1	2.3	454	59.6	2.8	35.8	(3.4)[b]	12.3	(3.4)[b]
Household Head Education													
<High school	313	32.3	4.0	583	14.7	2.5	1,262	51.0	2.6	17.6	(5.0)[b]	−18.8	(4.8)[b]
High school	623	52.6	2.8	773	21.9	2.0	479	51.4	3.4	30.7	(3.2)[b]	1.2	(4.1)[c]
Some college	397	63.8	2.3	317	37.2	3.5	226	68.0	5.2	26.6	(3.7)[b]	−4.1	(5.6)[c]
College graduate	505	83.0	2.4	139	54.4	4.9	74	78.3	7.4	28.6	(5.3)[b]	4.6	(7.6)[c]
Smoking During Pregnancy													
Yes	526	39.8	3.0	403	18.0	2.1	198	31.2	3.9	21.8	(3.7)[b]	8.6	(4.7)[c]
No	1,334	68.2	2.0	1,429	27.8	1.7	1,917	56.7	1.9	40.4	(2.1)[b]	11.5	(2.5)[b]
Maternal Body Mass Index													
<25.0	1,331	64.9	2.0	872	26.8	2.0	961	54.1	2.5	38.0	(2.5)[b]	10.8	(2.7)[b]
25.0–29.9	283	50.9	3.4	484	24.1	3.2	534	57.8	2.1	26.8	(4.5)[b]	−6.8	(4.1)[c]
≥30	204	48.6	4.8	415	24.3	2.7	359	47.1	4.4	24.3	(5.3)[b]	1.5	(6.1)[c]
Residence													
Metropolitan	762	67.2	3.0	943	32.0	1.9	1,384	56.1	2.0	35.3	(2.6)[b]	11.2	(2.9)[b]
Rural	1,107	54.9	3.1	902	18.3	1.9	734	51.3	3.1	36.6	(2.7)[b]	3.6	(4.0)[c]
Region													
Northeast	317	51.6	4.6	258	34.2	4.4	12	74.1	10.4	17.3	(3.6)[b]	−22.5	(14.5)[c]
Midwest	556	61.7	2.3	346	26.5	2.4	170	51.5	3.7	35.2	(3.3)[b]	10.2	(5.0)[a]
South	748	52.7	2.7	1,074	19.4	2.0	694	42.7	3.5	33.3	(2.7)[b]	10	(4.6)[a]
West	248	82.4	3.9	167	45.1	5.1	1,242	59.1	2.2	37.3	(7.1)[b]	23.4	(3.3)[b]

Table 15-30. Racial and Ethnic Differences in Proportion of Children Ever Breast-Fed, NHANES III (1988–1994) (continued)

	Non-Hispanic White			Non-Hispanic Black			Mexican American			Absolute Difference (%, SE)[a]			
										White vs. Black		White vs. Mexican American	
Poverty Income Ratio (%)	*N*	%	(SE)	*N*	%	(SE)	*N*	%	(SE)	%	(SE)	%	(SE)
<100	257	38.5	4.2	905	18.2	1.9	986	48.2	2.8	20.3	(4.4)[b]	–9.6	(4.7)[a]
100 to <185	388	55.7	2.6	391	26.8	2.1	490	54.1	3.4	28.9	(3.5)[b]	1.5	(4.2)[c]
185 to <350	672	61.9	2.5	294	32.0	3.0	288	64.7	4.7	30.0	(3.7)[b]	2.8	(5.3)[c]
≥350	444	77.0	2.5	105	58.1	5.1	74	71.9	9.0	19.0	(5.6)[b]	5.2	(9.0)[c]
Unknown	108	44.7	7.1	150	25.5	3.9	280	59.5	2.8	19.2	(7.9)[a]	–14.8	(7.9)[c]

[a] $p < 0.05$.
[b] $p < 0.01$.
[c] No statistical difference.
N = Number of infants.
SE = Standard error.

Source: Li and Grummer-Strawn (2002).

Table 15-31. Racial and Ethnic Differences in Proportion of Children Who Received Any Human Milk at 6 Months (NHANES III, 1988–1994)

	Non-Hispanic White			Non-Hispanic Black			Mexican American			Absolute Difference (%, SE)			
										White vs. Black		White vs. Mexican American	
Characteristic	*N*	%	(SE)	No.	%	(SE)	*N*	%	(SE)	%	(SE)	%	(SE)
All Infants	1,863	26.8	1.6	1,842	8.5	0.9	2,112	23.1	1.4	18.3	(1.7)[a]	3.7	(2.1)[b]
Infant Sex													
Male	900	27.6	2.3	912	8.5	1.1	1,029	22.3	1.6	19.1	(2.6)[a]	5.2	(2.6)[c]
Female	963	26.1	1.8	930	8.6	1.1	1,083	24.0	2.0	17.5	(2.1)[c]	2.1	(2.7)[b]
Infant Birth Weight (g)													
<2,500	118	10.9	3.1	221	4.2	1.8	165	15.2	4.7	6.7	(3.3)[c]	–4.3	(5.7)[b]
≥2,500	1,733	28.3	1.8	1,581	9.0	0.9	1,832	23.1	1.7	19.3	(1.8)[a]	5.2	(2.3)[c]
Maternal Age (years)													
<20	174	10.2	2.9	380	4.7	1.4	380	11.6	1.7	5.5	(3.0)[b]	–1.3	(3.8)[b]
20–24	461	13.4	2.4	559	7.5	1.1	646	23.8	2.4	5.9	(2.5)[c]	–10.4	(3.3)[a]
25–29	651	29.3	2.6	503	10.9	2.0	624	24.6	2.6	18.4	(3.5)[a]	4.8	(3.6)[b]
≥30	573	39.0	2.6	389	10.7	1.7	452	30.0	2.8	28.4	(3.3)[a]	9.0	(3.6)[c]
Household Head Education													
<High school	312	14.6	3.8	582	4.4	1.2	1,258	20.7	1.4	10.2	(4.5)[c]	–6.2	(4.1)[b]
High school	622	19.9	1.7	771	5.0	1.0	478	22.4	2.5	14.9	(2.0)[a]	2.5	(3.1)[b]
Some college	396	26.8	2.4	317	16.6	2.5	225	28.4	5.3	10.2	(3.5)[a]	–1.6	(6.1)[b]
College graduate	502	42.2	2.9	139	21.1	3.2	74	45.5	7.3	21.1	(5.2)[a]	3.4	(7.6)[b]
Smoking During Pregnancy													
Yes	524	11.3	1.5	402	4.3	1.1	198	9.3	2.2	7.0	(1.9)[a]	2.1	(2.7)[b]
No	1,331	32.7	2.1	1,427	9.8	1.1	1,911	24.5	1.5	22.9	(2.3)[a]	8.1	(2.6)[a]
Maternal Body Mass Index													
<25.0	1,326	29.6	1.8	871	8.9	1.2	959	21.9	2.1	20.7	(2.1)[a]	7.8	(2.7)[a]
25.0–29.9	282	19.0	2.4	482	8.2	1.9	534	26.4	1.9	10.8	(3.2)[a]	7.4	(3.0)[c]
≥30	204	20.4	4.1	415	7.3	1.6	357	17.2	3.0	13.1	(4.4)[a]	3.3	(5.2)[b]
Residence													
Metropolitan	760	29.7	2.5	941	11.8	1.3	1,378	23.5	1.7	17.9	(2.4)[a]	6.1	(3.1)[b]
Rural	1,103	24.6	2.4	901	4.9	0.9	734	22.5	2.8	19.7	(2.2)[a]	2.2	(3.4)[b]
Region													
Northeast	316	21.0	2.2	258	9.7	1.8	12	43.6	16.0	11.3	(1.8)[a]	–22.6	(16.5)[b]
Midwest	553	28.8	2.1	344	9.8	2.4	170	18.2	4.7	19.0	(3.7)[a]	10.6	(6.2)[b]
South	746	20.1	2.8	1,073	5.9	1.0	693	17.2	2.8	14.3	(2.8)[a]	2.9	(4.2)[b]
West	248	42.7	4.7	167	19.3	3.3	1,237	25.9	1.4	23.4	(5.3)[a]	16.8	(5.1)[a]

Table 15-31. Racial and Ethnic Differences in Proportion of Children Who Received Any Human Milk at 6 Months (NHANES III, 1988–1994) (continued)

	Non-Hispanic White			Non-Hispanic Black			Mexican American			Absolute Difference (%,SE)			
										White vs. Black		White vs. Mexican American	
Poverty Income Ratio (%)	*N*	%	(SE)	No.	%	(SE)	*N*	%	(SE)	%	(SE)	%	(SE)
100 to <185	387	23.5	2.9	390	9.9	1.8	486	23.4	2.7	13.6	(3.9)[a]	0	(4.1)[b]
185 to <350	670	30.4	2.7	293	10.0	2.4	287	27.6	4.4	20.4	(4.0)[a]	2.9	(4.8)[b]
≥350	443	33.0	3.0	105	15.2	2.8	74	32.3	9.0	17.8	(4.2)[a]	0.7	(9.5)[b]
Unknown	108	13.3	3.8	149	6.4	2.9	280	26.7	4.5	7.0	(5.3)[b]	−13.4	(6.6)[c]

[a] $p < 0.01$.
[b] No statistical difference.
[c] $p < 0.05$.
N = Number of individuals.
SE = Standard error.

Source: Li and Grummer-Strawn (2002).

Table 15-32. Racial and Ethnic Differences in Proportion of Children Exclusively Breast-Fed at 4 Months (NHANES III, 1991–1994)

	Non-Hispanic White			Non-Hispanic Black			Mexican American			Absolute Difference (%,SE)			
										White vs. Black		White vs. Mexican American	
Characteristic	*N*	%	(SE)	*N*	%	(SE)	*N*	%	(SE)	%	(SE)	%	(SE)
All Infants	824	22.6	1.7	906	8.5	1.5	957	20.4	1.4	14.1	(2.2)[a]	2.3	(1.6)[b]
Infant Sex													
Male	394	22.3	1.9	454	7.0	1.6	498	20.7	1.5	15.3	(2.6)[a]	1.5	(1.8)[b]
Female	430	23.0	2.2	452	10.0	2.2	459	20.0	1.8	12.9	(3.0)[a]	3.0	(2.1)[b]
Infant Birth Weight (g)													
<2,500	50	15.2	7.1	118	7.0	2.3	66	5.6	1.8	8.2	(8.1)[b]	9.5	(6.9)[b]
≥2,500	774	23.1	1.8	786	8.8	1.6	880	21.6	1.4	14.4	(2.2)[a]	1.5	(1.6)[b]
Maternal Age (years)													
<20	76	6.6	3.2	172	6.4	2.1	170	12.1	2.5	0.2	(3.7)[b]	–5.6	(3.8)[b]
20–24	205	11.4	2.2	273	7.4	2.4	319	21.0	2.3	4.0	(2.7)[b]	–9.6	(3.2)[a]
25–29	271	21.6	2.3	254	8.6	2.5	256	22.1	2.5	13.0	(3.2)[a]	–0.5	(3.2)[b]
≥30	270	34.8	2.7	201	11.9	2.6	210	23.6	3.1	22.9	(4.2)[a]	11.1	(3.7)[a]
Household Head Education													
<High school	146	9.5	3.5	256	2.0	0.7	563	19.7	1.8	7.5	(3.6)[c]	–10.2	(4.0)[c]
High school	277	14.5	2.7	406	7.1	2.1	222	18.8	3.6	7.4	(3.2)[c]	–4.3	(4.7)[b]
Some college	175	30.8	3.8	141	17.4	3.0	120	21.0	3.9	13.4	(4.7)[a]	9.8	(6.1)[b]
College graduate	219	34.1	3.9	92	17.4	4.7	37	31.5	4.5	16.7	(6.9)[c]	2.6	(6.3)[b]
Smoking During Pregnancy													
Yes	224	10.0	2.8	168	5.4	2.2	64	3.2	1.8	4.6	(3.7)[b]	6.8	(3.4)[b]
No	596	27.2	2.1	730	9.4	1.9	892	21.7	1.5	17.8	(2.8)[a]	5.6	(2.0)[c]
Maternal Body Mass Index													
<25.0	597	24.8	2.1	407	8.0	1.9	417	19.4	1.9	16.8	(3.0)[a]	5.4	(2.3)[c]
25.0–29.9	117	19.7	4.3	230	8.6	1.9	261	23.1	3.4	11.1	(4.6)[c]	–3.4	(4.9)[b]
≥30	91	15.4	3.8	230	9.0	2.9	184	15.9	2.3	6.4	(5.2)[b]	–0.5	(4.6)[b]
Residence													
Metropolitan	312	24.4	3	535	11.0	2.0	608	19.6	1.6	13.4	(3.5)[a]	4.8	(2.8)[b]
Rural	512	21.3	1.8	371	4.2	1.3	349	22.3	3.3	17.1	(1.8)[a]	–1.1	(3.0)[b]
Region													
Northeast	138	20.0	1.4	131	11.1	2.9	10	9.4	9.5	8.8	(2.2)[a]	10.6	(8.7)[b]
Midwest	231	26.5	3.2	143	12.6	5.6	98	19.2	4.1	13.9	(7.6)[b]	7.4	(3.7)[b]
South	378	14.1	2.8	574	5.9	1.4	383	15.9	3.1	8.2	(1.9)[a]	–1.8	(3.7)[b]
West	77	34.7	2.7	58	12.5	5.0	466	23.0	1.3	22.2	(5.4)[a]	11.7	(2.5)

Table 15-32. Racial and Ethnic Differences in Proportion of Children Exclusively Breast-Fed at 4 Months (NHANES III, 1991–1994) (continued)

	Non-Hispanic White			Non-Hispanic Black			Mexican American			Absolute Difference (%, SE)			
										White vs. Black		White vs. Mexican American	
Poverty Income Ratio (%)	*N*	%	(SE)	*N*	%	(SE)	*N*	%	(SE)	%	(SE)	%	(SE)
<100	116	13.1	3.3	448	5.7	1.6	471	18.4	1.8	7.4	(3.5)[c]	–5.3	(3.1)[b]
100 to <185	166	18.9	3.2	197	10.6	2.8	234	21.9	4.1	8.3	(3.3)[c]	–3	(6.1)[b]
185 to <350	274	25.1	3.2	145	12.9	4.3	132	26.4	4.2	12.2	(5.0)[c]	–1.3	(4.1)[b]
≥350	235	27.4	4.1	57	12.8	3.5	37	17.0	5.0	14.6	(5.0)[a]	10.4	(5.2)[b]
Unknown	33	16.5	7.6	59	7.3	3.7	83	16.1	5.1	9.2	(8.6)[b]	0.4	(9.5)[b]

[a] $p < 0.05$.
[b] $p < 0.01$.
[c] No statistical difference.
N = Number of individuals.
SE = Standard error.

Source: Li and Grummer-Strawn (2002).

Table 15-33. Percentage of Mothers Breast-Feeding Newborn Infants in the Hospital and Infants at 5 or 6 Months of Age in the United States in 1989 and 1995, by Ethnic Background and Selected Demographic Variables

Characteristic	Percentage of Mothers Breast-Feeding					
	In Hospital			At 6 Months		
	1989	1995	Change[a]	1989	1995	Change[a]
All Infants	52.2	59.7	14.4	18.1	21.6	19.3
White	58.5	64.3	9.9	21.0	24.1	14.8
Black	23.0	37.0	60.9	6.4	11.2	75.0
Hispanic	48.4	61.0	26.0	13.9	19.6	41.0
Maternal Age (years)						
<20	30.2	42.8	41.7	5.6	9.1	62.5
20 to 24	45.2	52.6	16.4	11.5	14.6	27.0
25 to 29	58.8	63.1	7.3	21.1	22.9	8.5
30 to 34	65.5	68.1	4.0	29.3	29.0	(1.0)[b]
35+	66.5	70.0	5.3	34.0	33.8	(0.6)[b]
Total Family Income						
<$10,000	31.8	41.8	31.4	8.2	11.4	39.0
$10,000 to $14,999	47.1	51.7	9.8	13.9	15.4	10.8
$15,000 to $24,999	54.7	58.8	7.5	18.9	19.8	4.8
≥25,000	66.3	70.7	6.6	25.5	28.5	11.8
Maternal Education						
Grade School	31.7	43.8	38.2	11.5	17.1	48.7
High School	42.5	49.7	16.9	12.4	15.0	21.0
College	70.7	74.4	5.2	28.8	31.2	8.3
Maternal Employment						
Employed Full Time	50.8	60.7	19.5	8.9	14.3	60.7
Employed Part Time	59.4	63.5	6.9	21.1	23.4	10.9
Not Employed	51.0	58.0	13.7	21.6	25.0	15.7
Birth Weight						
Low (≤2,500 g)	36.2	47.7	31.8	9.8	12.6	28.6
Normal	53.5	60.5	13.1	18.8	22.3	18.6
Parity						
Primiparous	52.6	61.6	17.1	15.1	19.5	29.1
Multiparous	51.7	57.8	11.8	21.1	23.6	11.8
WIC Participation[c]						
Participant	34.2	46.6	36.3	8.4	12.7	51.2
Non-participant	62.9	71.0	12.9	23.8	29.2	22.7
U.S. Census Region						
New England	52.2	61.2	17.2	18.6	22.2	19.4
Middle Atlantic	47.4	53.8	13.5	16.8	19.6	16.7
East North Central	47.6	54.6	14.7	16.7	18.9	13.2
West North Central	55.9	61.9	10.7	18.4	21.4	16.3
South Atlantic	43.8	54.8	25.1	13.7	18.6	35.8
East South Central	37.9	44.1	16.4	11.5	13.0	13.0
West South Central	46.0	54.4	18.3	13.6	17.0	25.0
Mountain	70.2	75.1	7.0	28.3	30.3	7.1
Pacific	70.3	75.1	6.8	26.6	30.9	16.2

[a] The percent change was calculated using the following formula: % breast-fed in 1984 – % breast-fed in 1989 ÷ % breast-fed in 1984.
[b] Figures in parentheses indicate a decrease in the rate of breast-feeding from 1989 to 1995.
[c] WIC indicates Women, Infants, and Children supplemental food program.

Source: Ryan (1997).

Table 15-34. Percentage of Mothers Breast-Feeding Newborn Infants in the Hospital and Infants at 6 and 12 Months of Age in the United States in 2003, by Ethnic Background and Selected Demographic Variables

Characteristic	Percentage of Mothers Breast-Feeding		
	In Hospital	At 6 Months	At 12 Months
All Infants	44	18	10
White	53	20	12
Black	26	10	5
Hispanic	33	15	12
Asian	39	23	12
Maternal Age (years)			
<20	28	9	4
20 to 24	40	13	8
25 to 29	48	20	10
30 to 34	50	23	14
35+	47	23	14
Maternal Education			
Any Grade School	26	13	17
Any High School	35	12	8
No College	35	12	8
College	55	24	14
Maternal Employment			
Employed Full Time	44	11	6
Employed Part Time	49	19	11
Total Employed	45	14	8
Not Employed	43	21	13
Low Birth Weight <5 lbs 9oz	27	10	6
Parity			
Primiparous	48	17	10
Multiparous	43	19	11
WIC Participation[a]			
Participant	32	11	7
Non-participant	55	25	14
U.S. Census Region			
New England	52	22	11
Middle Atlantic	36	17	9
East North Central	44	17	9
West North Central	55	18	9
South Atlantic	42	16	10
East South Central	37	11	7
West South Central	37	15	8
Mountain	53	23	16
Pacific	50	24	15

[a] WIC indicates Women, Infants, and Children supplemental food program.

Source: Abbott Labs (2003).

Table 15-35. Number of Meals per Day

Age (months)	Bottle-Fed Infants (meals/day)[a]	Breast-Fed (meals/day)[a]
1	5.4 (4–7)	5.8 (5–7)
2	4.8 (4–6)	5.3 (5–7)
3	4.7 (3–6)	5.1 (4–8)

[a] Data expressed as mean with range in parentheses.

Source: Hofvander et al. (1982).

Table 15-36. Comparison of Breast-Feeding Patterns Between Age and Groups (Mean ± SD)

Breast-Feeding Episodes per Day	5.8 ± 2.6	6.8 ± 2.4	2.5 ± 2.0
Total Time Breast-Feeding (minute/day)	65.2 ± 44.0	102.2 ± 51.4	31.2 ± 24.6
Length of Breast-Feeding (minute/episode)	10.8 ± 6.1	14.2 ± 6.1	11.6 ± 5.6

SD = Standard deviation.

Source: Buckley (2001).

16. ACTIVITY FACTORS

16.1. INTRODUCTION

Individual or group activities are important determinants of potential exposure. Toxic chemicals introduced into the environment may not cause harm to an individual until an activity is performed that brings the individual into contact with those contaminants. An activity or time spent in a given activity will vary among individuals depending on culture, ethnicity, hobbies, location, sex, age, socioeconomic characteristics, and personal preferences. However, limited information is available regarding ethnic, cultural, and socioeconomic differences in individuals' choice of activities or time spent in a given activity. Children are of special concern because certain activities and behaviors specific to children place them at a higher risk of exposure to certain environmental agents and expose them to higher levels of many chemicals (Chance and Harmsen, 1998). Trends associated with activity patterns include increases in the proportion of the population engaging in sedentary activities and decreases in physical activity in the home and related to work, including walking to work, as there has been a strong trend toward Americans living in the suburbs (Brownson et al., 2005). Recent trends in occupational mobility include the facts that average tenure increases directly with age, and that a large proportion of American workers show substantial job stability (U.S. Census Bureau, 2010). For population mobility, the U.S. Census Bureau reported that the national residential move rate increased to 12.5% in 2009 following a record low of 11.9% in 2008 (U.S. Census Bureau, 2010).

In calculating exposure, a person's average daily dose is determined from a combination of variables including the pollutant concentration, exposure duration, and frequency of exposure (see Chapter 1). These variables can be dependent on human activity patterns and time spent at each activity and/or location.

Time activity data are generally obtained using recall questionnaires and diaries to record the person's activities and microenvironments. Other methods include the use of videotaping and global positioning system technology to provide information on individuals' locations (Elgethun et al., 2003; Phillips et al., 2001).

Obtaining accurate information on time and activities can be challenging. This is especially true for children (Cohen Hubal et al., 2000). Children engage in more contact activities than adults; therefore, a much wider distribution of activities need to be considered when assessing children's exposure (Cohen Hubal et al., 2000). Mouthing behavior, which includes all activities in which objects, including fingers, are touched by the mouth or put into the mouth are provided in Chapter 4. Chapter 7 provides frequency and duration data for dermal (hand) contact.

This chapter summarizes data on how much time individuals spend participating in various activities in various microenvironments and on the frequency of performing various activities. Information is also provided on occupational mobility and population mobility. The data in this chapter cover a wide range of activities and populations, arranged by age group when such data are available. One of the objectives of this handbook is to provide recommended exposure factor values using a consistent set of age groups. In this chapter, several studies are used as sources for activity pattern data. In some cases, the source data could be retrieved and analyzed using the standard age groupings recommended in *Guidance for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). In other cases, the original source data were not available, and the study results are presented here using the same age groups as the original study, whether or not they conform to the standard age groupings.

The recommendations for activity factors are provided in the next section, along with a summary of the confidence ratings for these recommendations. The recommended values are based on key studies identified by U.S. Environmental Protection Agency (U.S. EPA) for this factor. Following the recommendations, key studies on activity patterns are summarized. Relevant data on activity patterns are also presented to provide the reader with added perspective on the current state-of-knowledge pertaining to activity patterns in adults and children. Additional information on microactivity patterns (i.e., hand-to-mouth, object-to-mouth, and dermal [hand] contact with surfaces and objects) is provided in Chapters 4 and 7.

16.2. RECOMMENDATIONS

16.2.1. Activity Patterns

Assessors are commonly interested in quantitative information describing several types of time use data for adults and children including the following: time spent indoors and outdoors; time spent bathing, showering, and swimming; and time spent playing on various types of surfaces. Table 16-1 summarizes the recommended values for these factors. Note that, except for swimming, all activity factors are reported in units of minutes/day.

Time spent swimming is reported in units of minutes/month. These data are based on 2 key studies presented in this chapter: a study of children's activity patterns in California (Wiley et al., 1991) and the National Human Activity Pattern Survey (NHAPS) (U.S. EPA, 1996). Both mean and 95th percentile recommended values are provided. However, because these recommendations are based on short-term survey data, 95th percentile values may be misleading for estimating chronic (i.e., long-term) exposures and should be used with caution. Also, the upper percentile values for some activities are truncated as a result of the maximum response included in the survey (e.g., durations of more than 120 minutes/day were reported as 121 minutes/day), and could not be further refined). Table 16-2 presents the confidence ratings for the recommendations.

The recommendations for total time spent indoors and the total time spent outdoors are based on the U.S. EPA re-analysis of the source data from Wiley et al. (1991) for children <1 year of age and U.S. EPA (1996) for childhood age groups >1 year of age. Although Wiley et al. (1991) is a study of California children and the sample size was very small for infants, it provides data for children's activities for the younger age groups. Data from U.S. EPA (1996) are representative of the U.S. general population. In some cases, however, the time spent indoors or outdoors would be better addressed on a site-specific basis since the times are likely to vary depending on the climate, residential setting (i.e., rural versus urban), personal traits (e.g., health status), and personal habits. For children >1 year of age, the recommended values for time spent indoors at a residence, duration of showering and bathing, time spent swimming, and time spent playing on sand, gravel, grass or dirt are based on a U.S. EPA re-analysis of the source data from U.S. EPA (1996). For adults 18 years and older, the recommended values are taken directly from the source document (U.S. EPA, 1996).

16.2.2. Occupational Mobility

Occupational mobility may be an important factor in determining exposure. For example, the duration of exposure to occupationally-related contaminants, such as the chemicals used in an industrial or laboratory setting, will be directly associated with the period of time an individual spends in the occupation.

The median occupational tenure of the working population (109.1 million people) ages 16 years of age and older in January 1987 was 7.9 years for men and 5.4 years for women (Carey, 1988). Since the occupational tenure varies significantly according to age and sex, the recommended values are given by 5-year age groups separately for males and females in Table 16-3. Section 16.4 provides occupational tenure for males and females combined. Part-time employment, race and the position held are important to consider in determining occupational tenure. These data are also presented in Section 16.4. Table 16-3 also presents recommendations for occupational mobility rate, by age. This rate is the percentage of persons employed in an occupation who had voluntarily entered it from another occupation. The overall percent was 5.3 (Carey, 1990). The ratings indicating confidence in the occupational mobility recommendations are presented in Table 16-4. It should be noted that the recommended values are not for use in evaluating job tenure. These data can be used for determining time spent in an occupation and not for time spent at a specific job site.

16.2.3. Population Mobility

An assessment of population mobility can assist in determining the length of time a household is exposed in a particular location. For example, the duration of exposure to site-specific contamination, such as a polluted stream from which a family fishes or contaminated soil on which children play or vegetables are grown, will be directly related to the period of time residents live near the contaminated site.

There are two key studies from which the population mobility recommendations were derived: the U.S. Census Bureau American Housing Survey, (U.S. Census Bureau, 2008a) and Johnson and Capel (1992). The U.S. Bureau of Census (2008a) provides data on current residence time and Johnson and Capel (1992) provide data on residential occupancy period. Table 16-5 presents the recommendations for population mobility. Table 16-6 presents the confidence ratings for these recommendations.

The 50th and 90th percentiles for current residence time from the U.S. Census Bureau (2008a) are 8 years and 32 years, respectively. The mean and 90th percentile for residential occupancy period from Johnson and Capel (1992) are 12 years and 26 years, respectively.

Table 16-1. Recommended Values for Activity Patterns[a]

Age Group	Mean	95th Percentile	Source
		Time Indoors (total) minutes/day	
Birth to <1 month	1,440	-	U.S. EPA analysis of source data from Wiley et al. (1991) for age groups from birth to <12 months. Average for boys and girls, whole population. See Table 16-14.
1 to <3 months	1,432	-	
3 to <6 months	1,414	-	
6 to <12 months	1,301	-	
1 to <2 years	1,353	-	U.S. EPA re-analysis of source data from U.S. EPA (1996) for age groups from 1 to <21 years, whole population. See Table 16-21.
2 to <3 years	1,316	-	
3 to <6 years	1,278	-	
6 to <11 years	1,244	-	
11 to <16 years	1,260	-	Adults, ≥18 years (U.S. EPA, 1996). Total minutes/24 hours (1,440) minus time outdoors, doers[b] only. See Table 16-22.
16 to <21 years	1,248	-	
18 to <65 years	1,159	-	
≥65 years	1,142	-	
		Time Outdoors (total) minutes/day	
Birth to <1 month	0	-	U.S. EPA analysis of source data from Wiley et al. (1991) for age groups from birth to <12 months. Average for boys and girls, whole population. See Table 16-14.
1 to <3 months	8	-	
3 to <6 months	26	-	
6 to <12 months	139	-	
1 to <2 years	36	-	U.S. EPA re-analysis of source data from U.S. EPA (1996) for age groups from 1 to <21 years, whole population. See Table 16-21.
2 to <3 years	76	-	
3 to <6 years	107	-	
6 to <11 years	132	-	
11 to <16 years	100	-	Adults, ≥18 years (U.S. EPA, 1996). Sum of minutes spent outdoors away from the residence and minutes spent outdoors at the residence. Doers[b] only. See Table 16-22.
16 to <21 years	102	-	
18 to <65 years	281	-	
≥65 years	298	-	
		Time Indoors (at residence) minutes/day	
Birth to <1year	1,108	1,440	Children, Birth to <21 years: U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-15.
1 to <2 years	1,065	1,440	
2 to <3 years	979	1,296	
3 to <6 years	957	1,355	
6 to <11 years	893	1,275	
11 to <16 years	889	1,315	Adults, ≥18 years (U.S. EPA, 1996). Doers[b] only. See Table 16-16.
16 to <21 years	833	1,288	
18 to <65 years	948	1,428	
≥65 years	1,175	1,440	
		Showering minutes/day	
Birth to <1year	15	-	U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-29.
1 to <2 years	20	-	
2 to <3 years	22	44	
3 to <6 years	17	34	
6 to <11 years	18	41	
11 to <16 years	18	40	
16 to <21 years	20	45	

Table 16-1. Recommended Values for Activity Patterns (continued)			
Age Group	Mean	95th Percentile	Source
		Bathing minutes/day	
Birth to <1 year	19	30	U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-29.
1 to <2 years	23	32	
2 to <3 years	23	45	
3 to <6 years	24	60	
6 to <11 years	24	46	
11 to <16 years	25	43	
16 to <21 years	33	60	
		Bathing/Showering minutes/day	
18 to <65 years	17	-	U.S. EPA (1996). Doers[b] only. See Table 16-30.
≥65 years	17	-	
		Swimming minutes/month	
Birth to <1 year	96	-	Children, Birth to <21 years: U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-40. Adults, ≥18 years (U.S. EPA, 1996). Doers[b] only. See Table 16-42.
1 to <2 years	105	-	
2 to <3 years	116	181	
3 to <6 years	137	181	
6 to <11 years	151	181	
11 to <16 years	139	181	
16 to <21 years	145	181	
18 to <65 years	45[c]	181	
≥65 years	40[c]	181	
		Playing on Sand/Gravel minutes/day	
Birth to <1 year	18	-	Children, <21 years: U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-43. Adults, ≥18 years (U.S. EPA, 1996). Doers[b] only. See Table 16-44.
1 to <2 years	43	121	
2 to <3 years	53	121	
3 to <6 years	60	121	
6 to <11 years	67	121	
11 to <16 years	67	121	
16 to <21 years	83	-	
18 to <65 years	0[c]	121	
≥65 years	0[c]	-	
		Playing on Grass minutes/day	
Birth to <1 year	52	-	Children, <21 years: U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-43. Adults, ≥18 years (U.S. EPA, 1996). Doers[b] only. See Table 16-44.
1 to <2 years	68	121	
2 to <3 years	62	121	
3 to <6 years	79	121	
6 to <11 years	73	121	
11 to <16 years	75	121	
16 to <21 years	60	-	
18 to <65 years	60[c]	121	
≥65 years	121[c]	-	

Table 16-1. Recommended Values for Activity Patterns (continued)

Age Group	Mean	95th Percentile	Source
	Playing on Dirt minutes/day		
Birth to <1 year	33	-	Children, <21 years: U.S. EPA re-analysis of source data from U.S. EPA (1996). Doers[b] only. See Table 16-43. Adults, ≥18 years (U.S. EPA, 1996). Doers[b] only. See Table 16-44.
1 to <2 years	56	121	
2 to <3 years	47	121	
3 to <6 years	63	121	
6 to <11 years	63	121	
11 to <16 years	49	120	
16 to <21 years	30	-	
18 to <65 years	0[c]	120	
≥65 years	0[c]	-	

- Percentiles were not calculated for sample sizes less than 10 or in cases where the mean was calculated by summing the means from multiple locations or activities.

[a] These activities are averaged over seasons.

[b] Doers are those respondents who engaged or participated in the activity.

[c] Median value, mean not available in U.S. EPA (1996).

Note: All activities are reported in units of minutes/day, except swimming, which is reported in units of minutes/month. There are 1,440 minutes in a day. Time indoors and outdoors may not add up to 1,440 minutes due to activities that could not be classified as either indoors or outdoors.

Table 16-2. Confidence in Recommendations for Activity Patterns

General Assessment Factors	Rationale	Rating
Soundness		High
Adequacy of Approach	The survey methodologies and data analyses were adequate. For the reanalysis of U.S. EPA (1996) study data, responses were weighted; however, adult data were not reanalyzed. The California children's activity pattern survey design (Wiley et al., 1991) and NHAPS (U.S. EPA, 1996) consisted of large overall sample sizes that varied with age. Data were collected via questionnaires and interviews.	
Minimal (or Defined) Bias	Measurement or recording error may have occurred since the diaries were based on 24 hour recall. The sample sizes for some age groups were small for some activity factors. The upper ends of the distributions were truncated for some factors. The data were based on short-term data.	
Applicability and Utility		Medium
Exposure Factor of Interest	The key studies focused on activities of children and adults.	
Representativeness	U.S. EPA (1996) was a nationally representative survey of the U.S. population and the reanalysis was weighted; the Wiley et al. (1991) survey was conducted in California and it was not representative of the U.S. population.	
Currency	The Wiley et al. (1991) study was conducted between April 1989 and February 1990; the U.S. EPA (1996) study was conducted between October 1992 and September 1994.	
Data Collection Period	Data were collected for a 24-hour period.	
Clarity and Completeness		Medium
Accessibility	The original studies are widely available to the public; U.S. EPA analysis of the original raw data from U.S. EPA (1996) is available upon request.	
Reproducibility	The methodologies were clearly presented; enough information was included to reproduce the results.	
Quality Assurance	Quality assurance methods were not well described in study reports.	
Variability and Uncertainty		Medium
Variability in Population	Variability was characterized across various age categories of children and adults.	
Uncertainty	The studies were based on short term recall data, and the upper ends of the distributions were truncated.	
Evaluation and Review		Medium
Peer Review	The original studies received a high level of peer review. The re-analysis of the U.S. EPA (1996) data to conform to the standardized age categories was not peer-reviewed.	
Number and Agreement of Studies	There were 2 key studies.	
Overall Rating		**Medium** for the mean; **low** for upper percentile

Table 16-3. Recommended Values for Occupational Mobility

Age Group	Median Tenure (years) Men	Median Tenure (years) Women	Source
All ages, ≥16 years	7.9	5.4	(Carey, 1988). See Table 16-103
16 to 24 years	2.0	1.9	
25 to 29 years	4.6	4.1	
30 to 34 years	7.6	6.0	
35 to 39 years	10.4	7.0	
40 to 44 years	13.8	8.0	
45 to 49 years	17.5	10.0	
50 to 54 years	20.0	10.8	
55 to 59 years	21.9	12.4	
60 to 64 years	23.9	14.5	
65 to 69 years	26.9	15.6	
≥70 years	30.5	18.8	

Age Group	Occupational Mobility Rate[a] (percent)	Source
16 to 24 years	12.7	(Carey, 1990). See Table 16-107
25 to 34 years	6.6	
35 to 44 years	4.0	
45 to 54 years	1.9	
55 to 64 years	1.0	
≥64 years	0.3	
Total, ≥16 years	5.3	

[a] Occupational mobility rate = percentage of persons employed in an occupation who had voluntarily entered it from another occupation.

Table 16-4. Confidence in Recommendations for Occupational Mobility

General Assessment Factors	Rationale	Rating
Soundness		Medium
Adequacy of Approach	Both studies are based on the U.S. Census Bureau's Current Population Survey which uses valid methodologies and approaches and is representative of the U.S. population with sample sizes of approximately 50,000 a month. Both studies are secondary analyses based on supplemental data to the January, 1987, Current Population Survey (a U.S. Census publication).	
Minimal (or Defined) Bias	Much of the original study data is not available. Only median values are reported. There is minimal concern about sampling and non-sampling error and non-response bias as in all surveys based on statistical samples.	
Applicability and Utility		Medium
Exposure Factor of Interest	Occupational tenure was the focus of both key studies.	
Representativeness	The data are statistically representative of the U.S. population.	
Currency	The data were collected over 20 years ago in 1986 and 1987. It is questionable whether the results would be the same if current data were analyzed based on changes in the economy that have occurred since the study was conducted.	
Data Collection Period	Data were collected in 1986–1987.	
Clarity and Completeness		Medium
Accessibility	The studies are widely available to the public. The Current Population Survey January, 1987: Occupational Mobility and Job Tenure data are available from the U.S. Census Bureau.	
Reproducibility	Results can be reproduced and methodology can be followed and evaluated.	
Quality Assurance	Quality assurance methods were not well described.	
Variability and Uncertainty		High
Variability in Population	The study provided averages according to sex, race, and education; age averages and percentiles were provided.	
Uncertainty	The studies are based on recall data.	
Evaluation and Review		Medium
Peer Review	The studies received a high level of peer review.	
Number and Agreement of Studies	There are 2 key studies based on the same data source.	
Overall Rating		**Medium**

Table 16-5. Recommended Values for Population Mobility

	Mean	95th Percentile	Source
Residential Occupancy Period	12 years	33 years	(Johnson and Capel, 1992). See Table 16-108.
Current Residence Time	13 years	46 years	(U.S. Census Bureau, 2008a). See Table 16-111.

Table 16-6. Confidence in Recommendations for Population Mobility

General Assessment Factors	Rationale	Rating
Soundness		Medium
Adequacy of Approach	Both key studies are based on U.S. Census Bureau studies which used valid data collection methodologies and approaches and are representative of the U.S. population.	
Minimal (or Defined) Bias	Data do not account for each member of the household; values are more realistic estimates for the individual's total residence time than the average time a household has been living at its current residence. The moving process was modeled in Johnson and Capel (1992) .For the mean and percentile calculations of U.S. Census Bureau (2008a) data, an even distribution was assumed within different ranges which may bias the statistics.	
Applicability and Utility		Medium
Exposure Factor of Interest	The Census data provided length of time at current residence. The other study used modeling to estimate total time.	
Representativeness	The sample surveyed was statistically representative of the U.S. population.	
Currency	The data were collected in 2007 and 1985–1987, and reported in 2008 and 1992, respectively.	
Data Collection Period	Data were collected throughout the calendar year.	
Clarity and Completeness		High
Accessibility	The studies are widely available to the public.	
Reproducibility	Results can be reproduced or methodology can be followed and evaluated.	
Quality Assurance	Quality assurance is discussed in the documentation on the U.S. Census Bureau studies.	
Variability and Uncertainty		Medium
Variability in Population	The study provided data by age and sex. Variability across several geographic regions was noted. Type of ownership was also addressed.	
Uncertainty	The U.S. Census Bureau data was truncated at 65 years.	
Evaluation and Review		High
Peer Review	The studies received high levels of peer review and appear in publications.	
Number and Agreement of Studies	The 2 studies produced similar results.	
Overall Rating		**Medium**

16.3. ACTIVITY PATTERNS

16.3.1. Key Activity Pattern Studies

16.3.1.1. *Wiley et al. (1991)—Study of Children's Activity Patterns*

The California Study of Children's Activity Patterns survey (Wiley et al., 1991) provided estimates of the time children spent in various activities and locations (microenvironments) on a typical day. The sample population consisted of 1,200 children, under 12 years of age, selected from English-speaking households using Random Digit Dial (RDD) methods. This represented a survey response rate of 77.9%. One child was selected from each household. If the selected child was less than 9 years old, the adult in the household who spent the most time with the child responded. However, if the selected child was between 9 and 11 years old, that child responded. The population was also stratified to provide representative estimates for major regions of the state. The survey questionnaire included a time diary which provided information on the children's activity and location patterns based on a 24-hour recall period. In addition, the survey questionnaire included questions about potential exposure to sources of indoor air pollution (e.g., presence of smokers) on the diary day, and the socio-demographic characteristics of children and adult respondents. The questionnaires and the time diaries were administered via a computer-assisted telephone interviewing (CATI) technology (Wiley et al., 1991). The telephone interviews were conducted during April 1989 to February 1990 over 4 seasons: spring (April to June 1989), summer (July to September 1989), fall (October to December 1989), and winter (January to February 1990).

The data obtained from the survey interviews resulted in 10 major activity categories, 113 detailed activity codes, 6 major categories of locations, and 63 detailed location codes. The time respondents under 12 years of age spent in the 10 activity categories (plus a "don't know" or non-coded activity category) are presented in Table 16-7. For each of the 10 activity categories, this table presents the mean duration for all survey participants, the percentage of respondents who reported participating in the activity (i.e., percent doers), and the mean, median, and maximum duration for only those survey respondents who engaged in the activity (i.e., doers). It also includes the detailed activity with the highest mean duration of time for each activity category. The activity category with the highest time expenditure was personal needs and care, with a mean of 794 minutes/day (13.2 hours/day). Night sleep was the detailed activity that had the highest mean duration in that activity category. The activity category "don't know" had a mean duration of about 2 minutes/day and only 4% of the respondents reported missing activity time.

Table 16-8 presents the mean time spent in the 10 activity categories by age and sex. Because the original source data were available, U.S. EPA re-analyzed the data according to the standardized age categories used in this handbook. Differences between activity patterns in boys and girls tended to be small. Table 16-9 presents the mean time spent in the 10 activity categories grouped by season and geographic region in the state of California. There were seasonal differences for 5 activity categories: personal needs and care, education, entertainment/social, recreation, and communication/passive leisure. Time expenditure differences in various regions of the state were minimal for childcare, work-related, goods/services, personal needs and care, education, entertainment/social, and recreation.

Table 16-10 presents the distribution of time across 6 location categories. The mean duration for all survey participants, the percent of respondents engaging in the activity (i.e., percent doers); the mean, median, and maximum duration for doers only; and the detailed locations with the highest average time expenditure are shown. For all survey respondents, the largest mean amount of time spent was at home (1,078 minutes/day); 99% of respondents spent time at home (mean of 1,086 minutes/day for these individuals only). Table 16-11 and Table 16-12 show the average time spent in the 6 locations grouped by age and sex, and season and region, respectively. Again, because the original source data were available, the age categories used by Wiley et al. (1991) have been replaced in Table 16-11 by the standardized age categories used in this handbook. There were relatively large differences among the age groups in time expenditure for educational settings (see Table 16-11). There were small differences in time expenditure at the 6 locations by region, but time spent in school decreased in the summer months compared with other seasons (see Table 16-12).

Table 16-13 shows the average time children spent in proximity to gasoline fumes and gas oven fumes. In general, the sampled children spent more time closer to gasoline fumes than to gas oven fumes. The age categories in Table 16-13 have been modified to conform to the standardized categories used in this handbook.

The U.S. EPA estimated the total time indoors and outdoors using the data from the Wiley et al. (1991) study. Activities performed indoors were assumed to include household work, child care, personal needs and care, education, and communication/passive leisure. The average times spent in these indoor activities and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., work-related, goods/services, organizational activities, entertainment/social, don't know/not coded) were summed. Table 16-14 summarizes the results of this analysis using the standard age groups.

A limitation of this study is that the sampling population was restricted to only English-speaking households; therefore, the data obtained do not represent the diverse population group present in California. Another limitation is that time use values obtained from this survey were based on short-term recall (24-hour) data; therefore, the data set obtained may be biased. Other limitations are as follows: the survey was conducted in California and is not representative of the national population, and the significance of the observed differences in the data obtained (i.e., sex, age, seasons, and regions) were not tested statistically. An advantage of this study is that time expenditure in various activities and locations were presented for children grouped by age, sex, and season. Also, potential exposures of respondents to pollutants were explored in the survey. Another advantage is the use of the CATI program in obtaining time diaries, which allows automatic coding of activities and locations onto a computer tape, and allows activities forgotten by respondents to be inserted into their appropriate position during interviewing.

16.3.1.2. *U.S. EPA (1996) —Descriptive Statistics Tables From a Detailed Analysis of the National Human Activity Pattern Survey (NHAPS) Data*

U.S. EPA (1996) analyzed data collected by the National Human Activity Pattern Survey. This survey was conducted by U.S. EPA and is the largest and most current human activity pattern survey available (U.S. EPA, 1996). Data for 9,386 respondents in the 48 contiguous United States were collected via minute-by-minute 24-hour diaries. NHAPS was conducted from October 1992 through September 1994 by the University of Maryland's Survey Research Center using CATI technology to collect 24-hour retrospective diaries and answers to a number of personal and exposure related questions from each respondent. Detailed data were collected for a maximum of 82 different possible locations, and a maximum of 91 different activities. Participants were selected using a RDD method. The response rate was 63% overall. If the chosen respondent was a child less than 10 years of age, an adult in the household gave a proxy interview. Each participant was asked to recount their entire daily routine from midnight to midnight immediately previous to the day that they were interviewed. The survey collected information on duration and frequency of selected activities and of the time spent in selected microenvironments. In addition, demographic information was collected for each respondent to allow for statistical summaries to be generated according to specific groups of the U.S. population (i.e., by sex, age, race, employment status, census region, season, etc.). Saturdays and Sundays were over sampled to ensure an adequate weekend sample.

For children, the source data from U.S. EPA for selected locations, both indoors and outdoors, and activities have been reviewed and re-analyzed by U.S. EPA to conform to the age categories recommended in *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). This analysis was weighted according to geographic, socioeconomic, time/season, and other demographic factors to ensure that results were representative of the U.S. population. The weighted sample matched the 1990 U.S. census population for each sex, age group, census region, and the day-of-week and seasonal responses were equally distributed.

Table 16-15 through Table 16-64 provide data from the NHAPS study. Because no data were available on subjects' age in months, age groups less than 1 year old were consolidated into a single group. These tables provide statistics for 24-hour cumulative time spent (mean, minimum, percentiles, and maximum) in selected locations or engaging in selected activities. The original analysis generated statistics for the subset of the survey population that reported being in the location or doing the activity in question (i.e., doers only). For the reanalysis, statistics were calculated for the entire survey population (i.e., whole population) and for doers only. When the sample size was 10 persons or fewer, percentile values were not calculated.

Re-analyzed data are presented for the time children, aged birth to less than 21 years, spent in selected locations both indoors and outdoors and doing various selected activities. Each children only table is followed by a table for the whole population which presents data for specific populations (i.e., by sex, age, race, ethnicity, employment, education, Census region, day of the week, season, asthma

status, and bronchitis/emphysema status) and includes the time adults, aged 18 years and older, spent in various locations and doing various activities. Table 16-15 and Table 16-16 present data for time spent in rooms of the house (e.g., kitchen, bathroom, bedroom, and garage), and all rooms combined, for children and by demographic characteristics (including adulthood) respectively. Table 16-17 and Table 16-18 present data for time spent in other indoor locations (e.g., restaurants, indoors at school, and grocery/convenience stores). Table 16-19 and Table 16-20 present data for the time survey participants spent outdoors on school grounds/playgrounds, parks or golf courses, or pool rivers, or lakes.

Table 16-21 provides data on time spent in indoor and outdoor environments for children birth to <21 years of age. The U.S. EPA estimated the time spent indoors by adding the average times spent indoors at the respondents' home (kitchen, living room, bathroom, etc.), at other houses, and inside other locations such as school, restaurants, etc. Time outdoors was estimated by adding the average time spent outdoors at the respondents' pool and yard, others' pool and yard, and outside other locations such as sidewalk, street, neighborhood, parking lot, service station/gas station, school grounds, park/golf course, pool, river, lake, farm, etc. Table 16-22 provides data on time spent in outdoor and indoor environments for adults aged 18 years and older. The average time spent outdoors was estimated by summing the average time spent outdoors away from the residence and the average time spent outdoors at the residence. Note that these averages are for doers only and thus over-estimate the total time spent in the environments for the population.

Table 16-23 and Table 16-24 present data for the time spent in various types of vehicles and mass transit (i.e., car, truck/van, bus, trains, airplanes), and in all vehicles combined. Table 16-25 and Table 16-26 present data for the time children and adults spent in various major activity categories (e.g., sleeping, napping, eating, attending school, outdoor recreation, active sports, exercise, and walking). Table 16-27 presents data for activities associated with time spent working.

Table 16-28 through Table 16-36 provide data related to showering and bathing. Data on handwashing activities are in Table 16-37 and Table 16-38. Table 16-39 and Table 16-40 provide data for children on monthly swimming (in a freshwater pool) frequency and swimming duration, respectively. Table 16-41 and Table 16-42 provide data by demographic characteristics (including adulthood) on monthly swimming (in a freshwater pool) frequency and swimming duration, respectively. Table 16-43 provides data on the time children spent playing on dirt, sand/gravel, or grass, and Table 16-44 displays these data by demographic characteristics (including adulthood).

Table 16-45 and Table 16-46 provide data on the number of minutes spent near excessive dust. Table 16-47 and Table 16-48 provide information on frequency of sweeping or vacuuming. Table 16-49 through Table 16-51 provide information on time spent in the presence of smokers and time spent smoking. Table 16-52 through Table 16-64 provide information on activities that may be related to specific sources of pollution (e.g., time spent near open flames, time spent near heavy traffic, frequency of use of dishwashers and washing machines). For this data set, the authors' original age categories for children were used because the methodology used to generate these data could not be reproduced.

The advantages of the NHAPS data set are that it is representative of the U.S. population. The reanalysis done by U.S. EPA to get estimates for childhood age groups that correspond to the *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005) was weighted and thus the results presented are balanced geographically, seasonally, and for day/time. Also, the NHAPS is inclusive of all ages, sexes, and races. A disadvantage of the study is that for the standard age categories, the number of respondents is small for the "doers" of many activities. In addition, the durations exceeding 60, 120, and 181 minutes were not collected for some activities. Therefore, the actual time spent at the high end of the distribution for these activities could not be accurately estimated. In addition, some of the activities were not necessarily mutually exclusive (e.g., time spent in active sports likely overlaps with exercise time).

16.3.2. Relevant Activity Pattern Studies

16.3.2.1. *Hill (1985)—Patterns of Time Use*

Hill (1985) investigated the total amount of time American adults spend in 1 year performing various activities and the variation in time use across 3 different dimensions: demographic characteristics, geographical location, and seasonal characteristics. In this study, time estimates were based on data collected from time diaries in 4 waves (1/season) of a survey conducted in the fall of 1975 through the fall of 1976 for the 1975–1976 Time Allocation Study. The sampling periods included 2 weekdays, 1 Saturday and 1 Sunday. The information gathered was in response to the survey question "What were

you doing?" The survey also provided information on secondary activities (i.e., respondents performing more than 1 activity at the same time). Hill (1985) analyzed time estimates from 971 individuals for 10 broad categories of activities based on data collected from 87 activities. These estimates included seasonal variation in time use patterns and comparisons of time use patterns for different days of the week.

Analysis of the 1975–1976 survey data revealed very small regional differences in time use among the broad activity patterns (Hill, 1985). The weighted mean hours/week spent performing the 10 major activity categories presented by region are shown in Table 16-65. Table 16-66 presents the time spent per day, by the day of the week for the 10 major activity categories. Adult time use was dominated in descending order by personal care (including sleep), market work, passive leisure, and housework. Collectively, these activities represent about 80% of available time (Hill, 1985).

According to Hill (1985), sleep (included in personal care) was the single most dominant activity averaging about 56.3 hours/week. Television watching (included in passive leisure) averaged about 21.8 hours/week, and housework activities averaged about 14.7 hours/week. Weekdays were predominantly market-work oriented. Weekends (Saturday and Sunday) were predominantly devoted to household tasks ("sleeping in," socializing, and active leisure) (Hill, 1985). Table 16-67 presents the mean time spent performing these 10 groups of activities during each wave of interview (fall, winter, spring, and summer). Adjustments were made to the data to assure equal distributions of weekdays, Saturdays, and Sundays (Hill, 1985). The data indicate that the time periods adults spent performing market work, child care, shopping, organizational activities, and active leisure were fairly constant throughout the year (Hill, 1985). The mean hours spent per week in performing the 10 major activity patterns are presented by sex in Table 16-68. These data indicate that time use patterns determined by data collected for the mid-1970's survey show sex differences. Men spent more time on activities related to labor market work and education, and women spent more time on household work activities.

A limitation associated with this study is that the time use data were obtained from an old survey conducted in the mid-1970s. Because of fairly rapid changes in American society, applying these data to current exposure assessments may result in some biases. Another limitation is that time use data were not presented for children. An advantage of this study is that time diaries were kept and data were not based on recall. The former approach may result in a more accurate data set. Another advantage of this study is that the survey is seasonally balanced since it was conducted throughout the year and the data are from a large survey sample.

16.3.2.2. *Timmer et al. (1985)—How Children Use Time*

Timmer et al. (1985) conducted a study using the data obtained on children's time use from a 1981–1982 panel study. Data were obtained for 389 children between 3 and 17 years of age. Data were collected using a time diary and a standardized interview. The time diary involved children reporting their activities beginning at 12:00 a.m. the previous night, the duration and location of each activity, the presence of another individual, and whether they were performing other activities at the same time. The standardized interview was administered to the children to gather information about their psychological, intellectual (using reading comprehension tests), and emotional well-being; their hopes and goals; their family environment; and their attitudes and beliefs.

For preschool children, parents provided information about the child's previous day's activities. Children in first through third grades completed the time diary with their parents' assistance and, in addition, completed reading tests. Children in 4th grade and above provided their own diary information and participated in the interview. Parents were asked to assess their children's socioemotional and intellectual development, and a survey form was sent to a teacher of each school-age child to evaluate their socioemotional and intellectual development. The activity descriptor codes used in this study were developed by Juster et al. (1983).

The mean time spent performing major activities on weekdays and weekends by age, sex, and type of day is presented in Table 16-69. On weekdays, children spend about 40% of their time sleeping, 20% in school, and 10% eating, and performing personal care activities (Timmer et al., 1985). The data in Table 16-69 indicate that girls spent more time than boys performing household work and personal care activities and less time playing sports. Also, the children spent most of their free time watching television.

Table 16-70 presents the mean time children spent during weekdays and weekends performing major activities by 5 different age groups. The significant effects of each variable (i.e., age and sex) are also shown. Older children spent more time performing household and market work, studying,

and watching television and less time eating, sleeping, and playing. The authors estimated that, on average, boys spent 19.4 hours a week and girls spent 17.8 hours/week watching television.

U.S. EPA estimated the total time indoors and outdoors using the Timmer et al. (1985) data. Activities performed indoors were assumed to include household work, personal care, eating, sleeping, attending school, studying, attending church, watching television, and engaging in household conversations. The average times spent in these indoor activities and half the time spent in each activity which could have occurred indoors or outdoors (e.g., market work, sports, hobbies, art activities, playing, reading, and other passive leisure) were summed. Table 16-71 summarizes the results of this analysis by age group and day of the week.

A limitation associated with this study is that it was conducted in 1981. It is likely that activity patterns of children have changed from 1981 to the present. Thus, the application of these data to current exposure assessments may bias their results. Another limitation is that the data do not provide overall annual estimates of children's time use since data were collected only during the time of the year when children attended school and not during school vacations. An advantage of this survey is that diary recordings of activity patterns were kept and the data obtained were not based entirely on recall. Another advantage is that parents assisted younger children with keeping their diaries and with interviews, minimizing any bias that may have been created by having younger children record their own data.

16.3.2.3. *Robinson and Thomas (1991)—Time Spent in Activities, Locations, and Microenvironments: A California-National Comparison*

Robinson and Thomas (1991) reviewed and compared data from the 1987–1988 California Air Resources Board (CARB) time-activity study for California residents and from a similar 1985 national study, *Americans' Use of Time*, conducted at the University of Maryland. Both studies used the diary approach to collect data. Time-use patterns were collected for individuals aged 12 years and older. Telephone interviews based on the RDD procedure were conducted for 1,762 and 2,762 respondents for the CARB study and the national study, respectively. Robinson and Thomas (1991) defined a set of 16 microenvironments based on the activity and location codes employed in the 2 studies. The mean durations of time spent in the 16 microenvironments by age, are presented in Table 16-72. In both studies, children and adults spent the majority of their time sleeping, and engaging in leisure and work/study-related activities.

Table 16-73 shows the mean time spent in the 10 major activities by sex and for all respondents between the ages of 18-64 years. Table 16-74 presents the mean time spent at 3 major locations for the CARB and national study grouped by total sample and sex, ages 18-64 years. The mean duration of time spent in locations for total sample population, 12 years and older, across 3 types of locations is presented in Table 16-75 for both studies.

The limitations associated with the Robinson and Thomas (1991) study are that the CARB survey was performed in California only and may not be representative of the U.S. population as a whole, and the studies were conducted in the 1980s and activity patterns may have changed over time. Another limitation is that the data are based on short-term studies. Finally, the available data could not be re-analyzed to conform to the standardized age categories used in this handbook.

16.3.2.4. *Funk et al. (1998)—Quantifying the Distribution of Inhalation Exposure in Human Populations: Distribution of Time Spent by Adults, Adolescents, and Children at Home, at Work, and at School*

Funk et al. (1998) used the data from the CARB study to determine distributions of exposure time by tracking the time spent participating in daily activities for male and female children, adolescents, and adults. CARB performed 2 studies from 1987 to 1990; the first was focused on adults (18 years and older) and adolescents (12 to 17 years old), and the second focused on children (6 to 11 years old). The targeted groups were non-institutionalized English speaking Californians with telephones in their residences. Individuals were contacted by telephone and asked to account for every minute within the previous 24 hours, including the amount of time spent on an activity and the location of the activity. The surveys were conducted on different days of the week as well as different seasons of the year.

Using the location descriptors provided in the CARB study, Funk et al. (1998) categorized the activities into 2 groups, "at home" (any activity at principal residence) and "away." Each activity was assigned to 1 of 3 inhalation rate levels (low, moderate, or high) based on the level of exertion expected from the activity. Ambiguous activities were assigned to moderate inhalation rate levels. Among the adolescents and children studied, means

were determined for the aggregate age groups. Sample sizes are shown in Table 16-76.

Funk et al. (1998) used several statistical methods, such as Chi-square, Kolmogorov-Smirnov, and Anderson-Darling, to determine whether the time spent in an activity group had a known distribution. Most of the activities performed by all individuals were assigned a low or moderate inhalation rate (see Table 16-77).

The aggregate time periods spent at home in each activity are shown in Table 16-78. Aggregate time spent at home performing different activities was compared between sexes. There were no significant differences between adolescent males and females in any of the activity groups (see Table 16-79). There were significant differences between males and females among adults in all activity groups except for the low activity group (see Table 16-58). In children, ages 6 to 11 years, differences between sex and age were observed at the low inhalation rate levels. There were significant differences ($p < 0.05$) between 2 age groups (6 to 8 years, and 9 to 11 years) and sex at the moderate inhalation rate level (see Table 16-80).

A limitation of this study was that large proportions of the respondents in the study did not participate in high-inhalation rate-level activities. The Funk et al. (1998) study was based on data from 1 geographic location, collected more than a decade ago. Thus, it may not be representative of current activities among the general population of the United States.

16.3.2.5. *Cohen Hubal et al. (2000)—Children's Exposure Assessment: A Review of Factors Influencing Children's Exposure and the Date Available to Characterize and Assess That Exposure*

Cohen Hubal et al. (2000) reviewed available data from the Consolidated Human Activity Database [CHAD, U.S. EPA (2009)], including activity pattern data, to characterize and assess environmental exposures to children. Data from the 2 key studies in this chapter (U.S. EPA, 1996; Wiley et al., 1991) are included in CHAD. CHAD was developed by the U.S. EPA's National Exposure Research Laboratory to provide access to existing human activity pattern data for use in exposure and risk assessment efforts. It is available online at http://www.epa.gov/chadnet1/. Data from twelve activity pattern studies conducted at the city, state, and national levels are included in CHAD. CHAD contains both the original raw data from each study and data modified based on predefined format requirements. Modifications made to data included: recoding of variables to fit into them a common activity/location code system, and standardization of time diaries to an exact 24-hour length. Detailed information on the coding system and the studies included in CHAD is available in the CHAD User Manual, available at http://oaspub.epa.gov/chad/CHAD_Datafiles$.startup#Manual, and in McCurdy et al. (2000).

A total of 144 activity codes and 115 location codes were used in CHAD (Mccurdy et al., 2000). Although some participants in a study conducted multiple activities, many activities were only conducted within a few studies. The same is true for activity locations. The selection of exposure estimates for a particular activity or particular location should be based on study parameters that closely relate to the exposure scenario being assessed. The maximum amount of time, on average, within a majority of the studies was sleeping or taking a nap, while the maximum amount of time spent at a particular location was at home or at work, depending on the study.

Many of the limitations of CHAD data arise from the incorporation of multiple studies into the time diary functions specified in CHAD. Activities and locations were coded similarly to the NHAPS study; studies with differing coding systems were modified to fit the NHAPS codes. In some cases start times and end times from a study had to be adjusted to fit a 24-hour period. Respondents were not randomly distributed in CHAD. For example, some cities or states were over sampled because entire studies were carried out in those places. Other studies excluded large groups of people such as smokers, or non-English speakers, or people without telephones. Many surveys were age restricted, or they preferentially sampled certain target groups. As a result, users are cautioned against using random individuals in CHAD to represent the U.S. population as a whole (Stallings et al., 2002).

CHAD contains 3,009 person-days of macroactivity data for 2,640 children less than 12 years of age (Cohen Hubal et al., 2000) (see Table 16-81). The number of hours these children spent in various microenvironments are shown in Table 16-82 and the time they spent in various activities indoors at home is shown in Table 16-83.

Cohen Hubal et al. (2000) noted that CHAD contains approximately "140 activity codes and 110 location codes, but the data generally are not available for all activity locations for any single respondent. In fact, not all of the codes were used for most of the studies. Even though many codes are used in macroactivity studies, many of the activity

codes do not adequately capture the richness of what children actually do. They are much too broadly defined and ignore many child-oriented behaviors. Thus, there is a need for more and better-focused research into children's activities."

U.S. EPA updated the analysis performed by Cohen Hubal et al. (2000) using CHAD data downloaded in 2000, sorted according to the age groups recommended in *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). Table 16-84 and Table 16-85 show the results. In this analysis, individual study participants within CHAD whose behavior patterns were measured over multiple days were treated as multiple 1-day activity patterns. This is a potential source of error or bias in the results because a single individual may contribute multiple data sets to the aggregate population being studied.

Advantages of the CHAD database are that it includes data from 12 activity pattern studies and is a fairly comprehensive tool for cohort development and for simulating individuals within exposure assessments. However, because the database is comprised of separate studies, issues such as quality assurance and consistency between the studies are difficult to assess. In addition, current human activity pattern surveys do not collect data on microactivities that are important to understanding exposures, especially for children, nor do they discriminate sufficiently among activities important to developing energy expenditure estimates.

16.3.2.6. *Wong et al. (2000)—Adult Proxy Responses to a Survey of Children's Dermal Soil Contact Activities*

Wong et al. (2000) conducted telephone surveys to gather information on children's activity patterns as related to dermal contact with soil during outdoor play on bare dirt or mixed grass and dirt surfaces. This study, the second Soil Contact Survey (SCS-II), was a follow-up to the initial Soil Contact Survey (SCS-I), conducted in 1996, that primarily focused on assessing adult behavior related to dermal contact with soil and dust (Garlock et al., 1999). As part of SCS-I, information was gathered on the behavior of children under the age of 18 years, however, the questions were limited to clothing choices and the length of time between soil contact and hand washing. Questions were posed for SCS-II to further define children's outdoor activities and hand washing and bathing frequency. For both soil contact surveys households were randomly phoned in order to obtain nationally representative results. The adult respondents were questioned as surrogates for 1 randomly chosen child under the age of 18 residing within the household.

In the SCS-II, of 680 total adult respondents with a child in their household, 500 (73.5%) reported that their child played outdoors on bare dirt or mixed grass and dirt surfaces (identified as "players"). Those children that reportedly did not play outdoors ("non-players") were typically very young (≤1 year) or relatively older (≥14 years). Of the 500 children that played outdoors, 497 played outdoors in warm weather months (April through October) and 390 were reported to play outdoors during cold weather months (November through March). These results are presented in Table 16-86. The frequency (days/week), duration (hours/day), and total hours/week spent playing outdoors was determined for those children identified as "players" (see Table 16-87). The responses indicated that children spent a relatively high percentage of time outdoors during the warmer months, and a lesser amount of time outdoors in cold weather. The median play frequency reported was 7 days/week in warm weather and 3 days/week in cold weather. Median play duration was 3 hours/day in warm weather and 1 hour/day during cold weather months.

Adult respondents were then questioned as to how many times per day their child washed his/her hands and how many times the child bathed or showered per week, during both warm and cold weather months. This information provided an estimate of the time between skin contact with soil and removal of soil by washing (i.e., exposure time). Hand washing and bathing frequencies for child players are reported in Table 16-88. Based on these results, hand washing occurred a median of 4 times per day during both warm and cold weather months. The median frequency for baths and showers was estimated to be 7 times per week for both warm and cold weather.

Based on reported household incomes, the respondents sampled in SCS-II tended to have higher incomes than that of the general population. This may be explained by the fact that phone surveys cannot sample households without telephones. Additional uncertainty or error in the study results may have occurred as a result of the use of surrogate respondents. Adult respondents were questioned regarding child activities that may have occurred in prior seasons, introducing the chance of recall error. In some instances, a respondent did not know the answer to a question or refused to answer. Table 16-89 compares mean play duration data from SCS-II to similar activities identified in NHAPS (U.S. EPA, 1996). Table 16-90 compares the number

of times per day a child washed his or her hands, based on data from SCS-II and NHAPS. As indicated in Table 16-89 and Table 16-90, where comparison is possible, NHAPS and SCS-II results showed similarities in observed behaviors.

An advantage of this study includes the fact that a random household survey was conducted to obtain nationally representative results. A limitation of the study is that questions were limited to clothing choices and the length of time between soil contact and hand washing. In addition, the participants were questioned about events from prior seasons, which may have introduced recall error.

16.3.2.7. *Graham and McCurdy (2004)—Developing Meaningful Cohorts for Human Exposure Models*

Graham and McCurdy (2004) used a statistical model (general linear model and analysis of variance [GLM/ANOVA]) to assess the significance of various factors in explaining variation in time spent outdoors, indoors and in motor vehicles. These factors, which are commonly used in developing cohorts for exposure modeling, included age, sex, weather, ethnicity, day type, and precipitation. Activity pattern data from CHAD, containing 30 or more records per day, were used in the analysis (Graham and Mccurdy, 2004). Data from the 2 key studies in this chapter (U.S. EPA, 1996; Wiley et al., 1991) are included in CHAD.

Table 16-91 presents data on time spent outdoors for people who spent >0 time outdoors (i.e., doers). Graham and McCurdy (2004) found that all the factors evaluated were significant ($p < 0.001$) in explaining differences in time spent outdoors (Graham and Mccurdy, 2004). An evaluation of sex differences in time spent outdoors by age cohorts was also conducted. Table 16-92 presents descriptive statistics and the results of the 2-sample Kolmogorov-Smirnov (K-S) test for this evaluation. As shown in Table 16-92, there were statistically significant sex differences in time spent outdoors starting with the 6 to 10 year old age category and continuing through all age groups, up to and including >64 years of age. In addition, Graham and McCurdy (2004) evaluated the effect of physical activity and concluded that this was the most important factor in explaining time spent outdoors. For time spent indoors (see Table 16-93), there were statistically significant effects for all the factors evaluated, with sex, weather, and day type being the most important variables. Regarding time spent in motor vehicles (see Table 16-94), precipitation was the only factor found to have no significant effects (Graham and Mccurdy, 2004).

Based on the results of these analyses, Graham and McCurdy (2004) noted that "besides age and sex, other important attributes for defining cohorts are the physical activity level of individuals, weather factors such as daily maximum temperature in combination with months of the year, and combined weekday/weekend with employment status." The authors also noted that even though the factors evaluated were found to be statistically significant in explaining differences in time spent outdoors, indoors, and in motor vehicles, "parameters such as lifestyle and life stages that are absent from CHAD might have reduced the amount of unexplained variance." The authors recommended that, in defining cohorts for exposure modeling, age and sex should be used as ''first-order'' attributes, followed by physical activity level, daily maximum temperature, and day type (weekend/weekday or day-of-the-week/working status) (Graham and Mccurdy, 2004).

The CHAD database is a fairly comprehensive tool for cohort development and for simulating individuals within exposure assessments. However, the database is comprised of 12 separate studies, and because of this, issues such as quality assurance and consistency between the studies are difficult to assess. In addition, current human activity pattern surveys do not collect data on microactivities that are important to understanding exposures, especially for children, nor do they discriminate sufficiently among activities important to developing energy expenditure estimates. Other limitations of the CHAD database are described earlier in this chapter by Cohen Hubal et al. (2000) in Section 16.3.2.5.

16.3.2.8. *Juster et al. (2004)—Changing Times of American Youth: 1983–2003*

Juster et al. (2004) evaluated changes in time use patterns of children by comparing data collected in a 1981–1982 pilot study of children ages 6 to 17 to data from the 2002–2003 Child Development Supplement (CDS) to the Panel Study of Income Dynamics (PSID). The 1981–1982 pilot study is the same study described in Timmer et al. (1985). The 2002–2003 CDS gathered 24-hour time diary data on 2,908 children ages 6 to 17; as was done in the 1997 CDS, information was collected on 1 randomly selected weekday and 1 randomly selected weekend day (Juster et al., 2004).

Table 16-95 and Table 16-96 present the mean time children spent (in minutes/day) performing major activities on weekdays and weekend days,

respectively, for the years 1981–1982 and 2002−2003. Table 16-97 shows the weekly time spent in these activities for the years 1981−1982 and 2002–2003. Juster et al. (2004) noted that the time spent in school and studying increased while time spent in active sports and outdoors activities decreased during the period studied.

An advantage of this survey is that diary recordings of activity patterns were kept and the data obtained were not based entirely on recall. Another advantage is that because parents assisted younger children with keeping their diaries and with interviews, minimizing any bias that may have been created by having younger children record their own data. A limitation associated with this study is that the data from the Timmer et al. (1985) study were collected in 1981 and it is likely that the activity patterns of children have changed from 1981 to the present. Another limitation is that the data from the CDS study do not provide overall annual estimates of children's time use since data were collected only during the time of the year when children attended school and not during school vacations.

16.3.2.9. *Vandewater et al. (2004)—Linking Obesity and Activity Level With Children's Television and Video Game Use*

Vandewater et al. (2004) evaluated children's media use and participation in active and sedentary activities using 24-hour time-use diaries collected in 1997, as part of the Child Development Supplement to the Panel Study of Income Dynamics. The PSID is an ongoing, longitudinal study of U.S. individuals and their families conducted by the Survey Research Center of the University of Michigan. In 1997, PSID families with children younger than 12 years of age completed the CDS and reported all activities performed by the children on 1 randomly selected weekday and 1 randomly selected weekend day. Since minorities, low-income families, and less educated individuals were oversampled in the PSID, sample weights were applied to the data (Vandewater et al., 2004). More information on the CDS can be found on-line at http://psidonline.isr.umich.edu/CDS/.

Using time use diary data from 2,831 children participating in the CDS, Vandewater et al. (2004) estimated the time in minutes over the 2-day study period (i.e., sum of time spent on 1 weekday and 1 weekend day) that children spent watching television, playing games on video games consoles or computers, reading, and using computers for other purposes besides playing games. In addition, the time spent participating in highly active (i.e., playing sports), moderately active (i.e., fishing, boating, camping, taking music lessons, and singing), and sedentary (i.e., using the phone, doing puzzles, playing board games, and relaxing) activities was determined. Table 16-98 presents the means and standard deviations for the time spent in the selected activities by age and sex.

A limitation of this study is that the survey was not designed for exposure assessment purposes. Therefore, the time use data set may be biased. However, the survey provides a database of current information on various human activities. This information can be used to assess various exposure pathways and scenarios associated with these activities.

16.3.2.10. *U.S. Department of Labor (2007)—American Time Use Survey, 2006 Results*

The American Time Use Study has been conducted annually since 2003 by the U.S. Department of Labor's (DOL) Bureau of Labor Statistics (U.S. Department of Labor, 2007). The purpose of the study is to collect "data on what activities people do during the day and how much time they spend doing them." In 2006, the survey focused on "the time Americans worked, did household activities, cared for household children, participated in educational activities, and engaged in leisure and sports activities." Approximately 13,000 individuals, 15 years of age and older, were interviewed during 2006. Participants were randomly selected and interviewed using the CATI method and were asked to recall their activities on the day before the interview. The survey response rate was 55.1% (U.S. Department of Labor, 2007). Data were collected for all days of the week, including weekends (i.e., 10% of the individuals were interviewed about their activities on 1 of the 5 weekdays, and 25% of the individuals were interviewed about their activities on 1 of the 2 weekend days). Demographic information, including age, sex, race/ethnicity, marital status, and educational level were also collected, and sample weights were applied to records to "reduce bias in the estimates due to differences in sampling and response rates across populations and days of the week." Data were collected for 17 major activities, which were subsequently combined into 12 categories for publication of the results. Table 16-99 provides information on the average amount of time spent in the 12 major time use categories by sex, age, race/ethnicity, marital status, and educational level (U.S. Department of Labor, 2007). Estimates of time

use in sub-categories of the 12 major categories are presented in Table 16-100. The majority of time was spent engaging in personal care activities (9.41 hours/day) which included sleeping (8.63 hours/day), followed by leisure and sports activities (5.09 hours/day), and work activities (3.75 hours/day). Note that because these data are averaged over both weekdays and weekends for the entire year, the amount of time spent daily on work-related activities does not reflect that of a typical work day.

Table 16-101 provides estimates of time use for all children ages 15 to 19 years by sex. It also provides a more detailed breakdown of the Leisure and Sports category for all children, ages 15 to 19 years old.

The limitation of this study is that it did not account for all activities during the day and therefore estimates about total time indoors and outdoors could not be calculated. The advantages are the large sample size, the representativeness of the sample, and the currency of the data.

16.3.2.11. *Nader et al. (2008)—Moderate-to-Vigorous Physical Activity From Ages 9 to 15 Years*

Nader et al. (2008) conducted a longitudinal study of 1,032 children from ages 9 to 15 years. The purpose of the study was to determine the amount of time children 9 to 15 years of age engaged in moderate-to-vigorous physical activities (MVPA) and compare results with the recommendations issued by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture (USDA, 2005) of a minimum of 60 minutes/day. Participants were recruited from university-based community hospitals located in Arkansas, California, Kansas, Massachusetts, Pennsylvania, Virginia, Washington, North Carolina, and Wisconsin. Children's activity levels were recorded for 4 to 7 days using an accelerometer, set so that it recorded minute-by-minute movement counts. The study participants included 517 boys and 515 girls.

The study found that at age nine years, children engaged in 3 hours of MVPA/day. By age 15 years, the amount of time engaged in MVPA was dropped to 49 minutes/day on weekdays and 35 minutes/day on weekends. Boys spent 18 more minutes/day of MVPA than girls on weekdays and 13 more minutes/day on weekends. Estimates of the mean time spent in MVPA by various age groups are presented in Table 16-102.

Advantages of this study include the fact that both weekdays and weekends were included in the study and the use of an accelerometer to measure physical activity. A limitation of the study is the fact that the sample of children was not nationally representative of the U.S. population. In addition, the study did not provide information about the amount of time spent at specific activities.

16.4. OCCUPATIONAL MOBILITY

16.4.1. Key Occupational Mobility Studies

16.4.1.1. *Carey (1988)—Occupational Tenure in 1987: Many Workers Have Remained in Their Fields*

Carey (1988) presented median occupational and employer tenure for different age groups, sex, earnings, ethnicity, and educational attainment. Occupational tenure was defined as "the cumulative number of years a person worked in his or her current occupation, regardless of number of employers, interruptions in employment, or time spent in other occupations" (Carey, 1988). The information presented was obtained from supplemental data to the January 1987 Current Population Study, a U.S. Census Bureau publication. Carey (1988) did not present information on the survey design.

The median occupational tenure by age and sex, race, and employment status are presented in Table 16-103, Table 16-104, and Table 16-105, respectively. The median occupational tenure of the working population (109.1 million people) 16 years of age and older in January of 1987 was 6.6 years (see Table 16-103). Table 16-103 also shows that median occupational tenure increased from 1.9 years for workers 16 to 24 years old to 21.9 years for workers 70 years and older. The median occupational tenure for men 16 years and older was higher (7.9 years) than for women of the same age group (5.4 years). Table 16-104 indicates that Whites had longer occupational tenure (6.7 years) than Blacks (5.8 years), and Hispanics (4.5 years). Full-time workers had more occupational tenure than part-time workers 7.2 years and 3.1 years, respectively (see Table 16-105).

Table 16-106 presents the median occupational tenure among major occupational groups. The median tenure ranged from 4.1 years for service workers to 10.4 years for people employed in farming, forestry, and fishing.

The strength of an individual's attachment to a specific occupation has been attributed to the individual's investment in education (Carey, 1988). Carey (1988) reported the median occupational tenure for the surveyed working population by age and educational level. Workers with 5 or more years of college had the highest median occupational tenure

of 10.1 years. Workers that were 65 years and older with 5 or more years of college had the highest occupational tenure level of 33.8 years. The median occupational tenure was 10.6 years for self-employed workers and 6.2 years for wage and salary workers (Carey, 1988).

A limitation associated with this study is that the survey design employed in the data collection was not presented, though it can be found on the U.S. Census Bureau's website. Therefore, the validity and accuracy of the data set cannot be determined. Another limitation is that only median values were reported in the study. An advantage of this study is that occupational tenure (years spent in a specific occupation) was obtained for various age groups by sex, ethnicity, employment status, and educational level. Another advantage of this study is that the data were based on a survey population which appears to represent the general U.S. population.

16.4.1.2. *Carey (1990)—Occupational Tenure, Employer Tenure, and Occupational Mobility*

Carey (1990) conducted another study that was similar in scope to the study of Carey (1988). The January 1987 Current Population Study was used. This study provided data on occupational mobility and employer tenure in addition to occupational tenure. Occupational tenure was defined in Carey (1988) as the "the cumulative number of years a person worked in his or her current occupation, regardless of number of employees, interruptions in employment, or time spent in other locations." Employer tenure was defined as "the length of time a worker has been with the same employer," while occupational mobility was defined as "the number of workers who change from 1 occupation to another" (Carey, 1990). Occupational mobility was measured by asking individuals who were employed in both January 1986 and January 1987 if they were doing the same kind of work in each of these months (Carey, 1990). Carey (1990) further analyzed the occupational mobility data and obtained information on entry and exit rates for occupations. These rates were defined as "the percentage of persons employed in an occupation who had voluntarily entered it from another occupation" and an exit rate was defined as "the percentage of persons employed in an occupation who had voluntarily left for a new occupation" (Carey, 1990).

Table 16-107 shows the voluntary occupational mobility rates in January 1987 for workers 16 years and older. For all workers, the overall voluntary occupational mobility rate during that year was 5.3%. These data also show that younger workers left occupations at a higher rate than older workers. Carey (1990) reported that 10 million of the 100.1 million individuals employed in January 1986 and in January 1987 had changed occupations during that period, resulting in an overall mobility rate of 9.9%. Executive, administrative, and managerial occupations had the highest entry rate of 5.3%, followed by administrative support (including clerical) at 4.9%. Sales had the highest exit rate of 5.3% and service had the 2nd highest exit rate of 4.8% (Carey, 1990). In January 1987, the median employer tenure for all workers was 4.2 years. The median employee tenure was 12.4 years for those workers that were 65 years of age and older (Carey, 1990).

Because the study was conducted by Carey (1990) in a manner similar to that of the previous study (Carey, 1988), the same advantages and disadvantages associated with Carey (1988) also apply to this data set.

16.5. POPULATION MOBILITY

16.5.1. Key Population Mobility Studies

16.5.1.1. *Johnson and Capel (1992)—A Monte Carlo Approach to Simulating Residential Occupancy Periods and Its Application to the General U.S. Population*

Johnson and Capel (1992) developed a methodology to estimate the distribution of the residential occupancy period (ROP) in the national population. ROP denotes the time (years) between a person moving into a residence and the time the person moves out or dies. The methodology used a Monte Carlo approach to simulate a distribution of ROP for 500,000 persons using data on population, mobility, and mortality.

The methodology consisted of 6 steps. The 1st step defined the population of interest and categorized them by location, sex, age, sex, and race. Next the demographic groups were selected and the fraction of the specified population that fell into each group was developed using U.S. Census Bureau data. A mobility table was developed based on census data, which provided the probability that a person with specified demographics did not move during the previous year. The fifth step used data on vital statistics published by the National Center for Health Statistics and developed a mortality table which provided the probability that individuals with specific demographic characteristics would die during the upcoming year. As a final step, a computer based algorithm was used to apply a Monte Carlo approach to a series of persons selected at random from the population being analyzed.

Table 16-108 presents the results for residential occupancy periods for the total population, by sex. The estimated mean ROP for the total population was 11.7 years. The distribution was skewed (Johnson and Capel, 1992): the 25th, 50th, and 75th percentiles were 3, 9, and 16 years, respectively. The 90th, 95th, and 99th percentiles were 26, 33, and 47 years, respectively. The mean ROP was 11.1 years for males and 12.3 years for females, and the median value was 8 years for males and 9 years for females.

Descriptive statistics for groups defined by current ages were also calculated. These data, presented by sex, are shown in Table 16-109. The mean ROP increases from age 3 to age 12 years and there is a noticeable decrease at age 24 years. However, there is a steady increase from age 24 through age 81 years.

There are a few biases within this methodology that have been noted by the authors. The probability of not moving is estimated as a function only of sex and age. The Monte Carlo process assumes that this probability is independent of (1) the calendar year to which it is applied, and (2) the past history of the person being simulated. These assumptions, according to Johnson and Capel (1992), are not entirely correct. They believe that extreme values are a function of sample size and will, for the most part, increase as the number of simulated persons increases.

16.5.1.2. *U.S. Census Bureau (2008a)—American Housing Survey for the United States in 2007*

This survey is a national sample of 55,000 interviews in which data were collected from present owners, renters, Black householders, and Hispanic householders. The data reflect the number of years a unit has been occupied and represent all occupied housing units that the residents' rented or owned at the time of the survey.

The results of the survey pertaining to residence time of owner/renter occupied units in the United States are presented in Table 16-110. Using the data in Table 16-110, the percentages of householders living in houses for specified time ranges were determined and are presented in Table 16-111. Based on the U.S. Census Bureau data in Table 16-111, the 50th percentile and the 90th percentile values were calculated for the number of years lived in the householder's current house. These values were calculated by apportioning the total sample size (110,692 households) to the indicated percentile associated with the applicable range of years lived in the current home. Assuming an even distribution within the appropriate range, the 50th and 90th percentile values for years living in the current home were determined to be 8.0 and 32.0 years, respectively. Based on the above data, 8 and 32 years are assumed to best represent a central tendency estimate of length of residence and upper percentile estimate of residence time, respectively.

A limitation associated with the above analysis is the assumption that there is an even distribution within the different ranges. As a result, the 50th and 90th percentile values may be biased.

16.5.2. Relevant Population Mobility Studies

16.5.2.1. *Israeli and Nelson (1992)—Distribution and Expected Time of Residence for U.S. Households*

In risk assessments, the average current residence time (time since moving into current residence) has often been used as a substitute for the average total residence time (time between moving into and out of a residence) (Israeli and Nelson, 1992). Israeli and Nelson (1992) have estimated distributions of expected time of residence for U.S. households. Distributions and averages for both current and total residence times were calculated for several housing categories using the 1985 and 1987 U.S. Census Bureau housing survey data. The total residence time distribution was estimated from current residence time data by modeling the moving process (Israeli and Nelson, 1992). Israeli and Nelson (1992) estimated the average total residence time for a household to be approximately 4.6 years or 1/6 of the expected life span (see Table 16-112). The maximal total residence time that a given fraction of households will live in the same residence is presented in Table 16-113. For example, only 5% of the individuals in the "All Households" category will live in the same residence for 23 years and 95% will move in less than 23 years.

The authors note that the data presented are for the expected time a household will stay in the same residence. The data do not predict the expected residence time for each member of the household, which is generally expected to be smaller (Israeli and Nelson, 1992). These values are more realistic estimates for the individual total residence time, than the average time a household has been living at its current residence. The expected total residence time for a household is consistently less than the average current residence time. This is the result of greater weighting of short residence time when calculating the average total residence time than when calculating the average current residence time (Israeli and Nelson, 1992). When averaging total residence

over a time interval, frequent movers may appear several times, but when averaging current residence times, each household appears only once (Israeli and Nelson, 1992). According to Israeli and Nelson (1992), the residence time distribution developed by the model is skewed and the median values are considerably less than the means, which are less than the average current residence times.

Advantages of this study are the large sample size and its representativeness to the U.S. population, since it was based on U.S. Census Bureau housing survey data. Several limitations of the study have been noted by Israeli and Nelson (1992) above. An additional limitation is the age of the study and the fact that the U.S. Census Bureau housing survey is based on recall data.

16.5.2.2. *National Association of Realtors (NAR) (1993)—The Home Buying and Selling Process*

The NAR survey was conducted by mailing a questionnaire to 15,000 home buyers throughout the United States who purchased homes during the second half of 1993. The survey was conducted in December 1993 and 1,763 usable responses were received, equaling a response rate of 12% (NAR, 1993). Of the respondents, 41% were first time buyers. Home buyer names and addresses were obtained from Dataman Information Services (DIS). DIS compiles information on residential real estate transactions from more than 600 counties throughout the United States using courthouse deed records. Most of the 250 Metropolitan Statistical Areas are also covered in the DIS data compilation.

The home buyers were questioned on the length of time they owned their previous home. The typical homebuyer (40%) was found to have lived in their previous home between 4 and 7 years (see Table 16-114). The survey results indicate that the average tenure of home buyers is 7.1 years based on an overall residence history of the respondents (NAR, 1993). In addition, the median length of residence in respondents' previous homes was found to be 6 years (see Table 16-115).

The distances the respondents moved to their new homes were typically short distances. Data presented in Table 16-116 indicate that the mean distances range from 230 miles for new home buyers and 270 miles for repeat buyers to 110 miles for first time buyers and 190 for existing home buyers. Seventeen percent (17%) of respondents purchased homes over 100 miles from their previous homes and 49% purchased homes less than 10 miles away.

Advantages of this study are the large sample size and its representativeness to the U.S. population, since it was based on 15,000 home buyers throughout the United States. A limitation of the study is the fact that the data are over 17 years old.

16.5.2.3. *U.S. Census Bureau (2008b)—Current Population Survey 2007, Annual Social and Economic Supplement*

The Current Population Survey is conducted monthly by the U.S. Census Bureau. The sample is selected to be statistically representative of the civilian non-institutionalized U.S. population. The data presented in Table 16-117 and Table 16-118 are yearly averages for the year 2006–2007. Approximately 50,000 people are surveyed each month.

Table 16-117 presents data on general mobility by demographic factors (i.e., sex, age, education, marital status, nativity, tenure, and poverty status). "Movers" are respondents who did not report living at the same residence 1 year earlier than the date of interview. Of the total number of respondents, 13% had moved residences. Of those, 65% moved within the same county. Table 16-118 presents data on these intercounty moves and shows that of these intercounty moves, over 60% moved less than 200 miles.

Advantages of this study are the large sample size, the currency of the data set, and its representativeness to the U.S. population. Limitations are that the study is based on recall data and that due to the Current Population Survey design, data for states are not as reliable as nationwide estimates.

16.6. REFERENCES FOR CHAPTER 16

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Table 16-7. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Ten Major Activity Categories, for All Respondents and Doers

Activity Category	Mean Duration (All)	% Doers[a]	Mean Duration (Doers)[a]	Median Duration (Doers)[a]	Maximum Duration (Doers)[a]	Detailed Activity with Highest Average Minutes
Work-related[b]	10	25	39	30	405	Eating at Work/School/Daycare
Household[c]	53	86	61	40	602	Travel to Household
Childcare[d]	<1	<1	83	30	290	Other Child Care
Good/Service[e]	21	26	81	60	450	Errands
Personal Needs and Care[f]	794	100	794	770	1,440	Night Sleep
Education[g]	110	35	316	335	790	School Classes
Organizational Activities[h]	4	4	111	105	435	Attend Meetings
Entertain/Social[i]	15	17	87	60	490	Visiting with Others
Recreation[j]	239	92	260	240	835	Games
Communication/Passive Leisure [k]	192	93	205	180	898	TV Use
Don't know/Not coded	2	4	41	15	600	-
All Activities	1,440	-	-	-	-	-

[a] Doers indicate the respondents who reported participating in each activity category.

[b] Includes: travel to and during work/school; children's paid work; eating at work/school/daycare; and accompanying or watching adult at work.

[c] Includes: food preparation; meal cleanup; cleaning; clothes care; car and home repair/painting; building a fire; plant and pet care; and traveling to household.

[d] Includes: baby and child care; helping/teaching children; talking and reading; playing while caring for children; medical care; travel related to child care; and other care.

[e] Includes: shopping; medical appointments; obtaining personal care services (e.g., haircuts), government and financial services, and repairs; travel related to goods and services; and errands.

[f] Includes: bathing, showering, and going to bathroom; medical care; help and care; meals; night sleep and daytime naps, dressing and grooming; and travel for personal care.

[g] Includes: student and other classes; daycare; homework; library; and travel for education.

[h] Includes: attending meetings and associated travel.

[i] Includes: sports events; eating and amusements; movies and theater; visiting museums, zoos, art galleries, etc.; visiting others; parties and other social events; and travel to social activities.

[j] Includes: active sports; leisure; hobbies; crafts; art; music/drama/dance; games; playing; and travel to leisure activities.

[k] Includes: radio and television use; reading; conversation; paperwork; other passive leisure; and travel to passive leisure activities.

Source: Wiley et al. (1991).

Table 16-8. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Ten Major Activity Categories, by Age and Sex

Activity Category[a]	Boys									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[b]	Birth to 11 Years
Work-related	0	0	0	1	8	9	10	12	13	11
Household	12	30	49	28	35	44	44	61	63	58
Childcare	0	0	0	0	0	0	0	0	3	2
Goods/Services	0	16	14	28	27	14	28	22	24	26
Personal Needs and Care	910	1,143	937	919	903	889	802	726	707	802
Education	180[c]	0	75	70	33	69	67	120	120	100
Organizational Activities	0	0	0	0	7	0	5	11	16	6
Entertainment/Social	0	0	0	0	8	6	15	15	43	18
Recreation	0	0	26	104	314	304	294	265	227	228
Communication/Passive Leisure	338	250	339	292	106	103	175	208	226	226
Sample Sizes (Unweighted)	3	7	15	31	54	62	151	239	62	624

Activity Category[a]	Girls									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[b]	Birth to 11 Years
Work-related	0	0	5	1	3	22	9	10	19	11
Household	28	29	23	25	45	65	49	67	78	58
Childcare	0	0	0	0	0	0	0	2	9	2
Goods/Services	0	18	14	24	24	34	31	26	15	26
Personal Needs and Care	1,123	1,115	971	922	894	858	820	747	703	802
Education	0	0	110	94	25	40	81	134	151	100
Organizational Activities	0	0	0	0	0	2	3	8	13	6
Entertainment/Social	0	0	0	1	13	6	16	17	52	18
Recreation	0	0	10	147	256	305	270	224	175	228
Communication/Passive Leisure	290	278	308	226	179	107	161	203	225	189
Sample Sizes (Unweighted)	4	10	11	23	43	50	151	225	59	576

[a] See Table 16-3 for a description of what is included in each activity category.

[b] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

[c] The data for this age group and category are 2 values of 0 and 1 of 540.

Note: Column totals may not sum to 1,440 due to rounding.

Source: U.S. EPA analysis of source data used by Wiley et al. (1991).

Table 16-9. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Ten Major Activity Categories, Grouped by Seasons and Regions

Activity Category[a]	Season					Region of California			
	Winter (Jan–Mar)	Spring (Apr–June)	Summer (July–Sept)	Fall (Oct–Dec)	All Seasons	Southern Coast	Bay Area	Rest of State	All Regions
Work-related	10	10	6	13	10	10	10	8	10
Household	47	58	53	52	53	45	62	55	53
Childcare	<1	1	<1	<1	<1	<1	<1	1	<1
Goods/Services	19	17	26	23	21	20	21	23	21
Personal Needs and Care	799	774	815	789	794	799	785	794	794
Education	124	137	49	131	110	109	115	109	110
Organizational Activities	3	5	5	3	4	2	6	6	4
Entertainment/Social	14	12	12	22	15	17	10	16	15
Recreation	221	243	282	211	239	230	241	249	239
Communication/ Passive Leisure	203	180	189	195	192	206	190	175	192
Don't know/Not coded	<1	2	3	<1	2	1	1	3	2
All Activities[b]	1,442	1,439	1,441	1,441	1,441	1,440	1,442	1,439	1,441
Sample Sizes (Unweighted)	318	204	407	271	1,200	224	263	713	1,200

[a] See Table 16-3 for a description of what is included in each activity category.
[b] The column totals may not be equal to 1,440 due to rounding.

Source: Wiley et al. (1991).

Table 16-10. Time (minutes/day) Children Under 12 Years of Age Spent in 6 Major Location Categories, for All Respondents and Doers

Location Category	Mean Duration (All)	% Doers[a]	Mean Duration (Doers)[a]	Median Duration (Doers)[a]	Maximum Duration (Doers)[a]	Detailed Location with Highest Average Time
Home	1,078	99	1,086	1,110	1,440	Home – Bedroom
School/Childcare	109	33	330	325	1,260	School or Daycare Facility
Friend's/Other's House	80	32	251	144	1,440	Friend's/Other's House – Bedroom
Stores, Restaurants, Shopping Places	24	35	69	50	475	Shopping Mall
In-transit	69	83	83	60	1,111	Traveling in Car
Other Locations	79	57	139	105	1,440	Park, Playground
Don't Know/Not Coded	<1	1	37	30	90	-
All Locations	1,440	-	-	-	-	-

[a] Doers indicate the respondents who reported participating in each activity category.

Source: Wiley et al. (1991).

Table 16-11. Mean Time (minutes/day) Children Under 12 Years of Age Spent in 6 Location Categories, Grouped by Age and Sex

Location Category	Boys									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Home	938	1,295	1,164	1,189	1,177	1,161	1,102	1,016	1,010	1,079
School/Childcare	0	1	26	53	73	86	79	110	99	89
Friend's/Other's House	418	40	127	63	54	69	89	110	111	95
Stores, Restaurants, Shopping Places	0	14	21	36	29	22	24	23	20	24
In-transit	77	51	69	63	56	61	67	64	72	65
Other Locations	7	40	33	36	52	41	78	116	127	88
Don't Know/Not Coded	0	0	0	0	0	0	0	0	0	0
Sample Sizes (Unweighted)	3	7	15	31	54	62	151	239	62	624
Location Category	Girls									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Home	1,285	1,341	1,151	1,192	1,162	1,065	1,118	1,012	862	1,058
School/Childcare	0	0	109	99	56	61	78	116	128	95
Friend's/Other's House	0	12	44	32	109	103	66	119	193	103
Stores, Restaurants, Shopping Places	0	13	20	15	21	40	32	25	24	27
In-transit	73	56	42	58	55	86	78	70	95	74
Other Locations	83	19	73	43	38	86	67	97	137	84
Don't Know/Not Coded	0	0	0	0	0	0	1	0	0	0
Sample Sizes (Unweighted)	4	10	11	23	43	50	151	225	59	576

[a] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

Note: Column totals may not sum to 1,440 due to rounding.

Source: U.S. EPA analysis of source data used by Wiley et al. (1991).

Table 16-12. Mean Time (minutes/day) Children Under 12 Years of Age Spent in 6 Location Categories, Grouped by Season and Region

Location Category	Season					Region of California			
	Winter (Jan–Mar)	Spring (Apr–June)	Summer (July–Sept)	Fall (Oct–Dec)	All Seasons	Southern Coast	Bay Area	Rest of State	All Regions
Home	1,091	1,042	1,097	1,081	1,078	1,078	1,078	1,078	1,078
School/Childcare	119	141	52	124	109	113	103	108	109
Friend's/Other's House	69	75	108	69	80	73	86	86	80
Stores, Restaurants, Shopping Places	22	21	30	24	24	26	23	23	24
In transit	75	75	60	65	69	71	73	63	69
Other Locations	63	85	93	76	79	79	76	81	79
Don't Know/Not Coded	<1	<1	<1	<1	<1	<1	<1	<1	<1
All Locations[a]	1,439	1,439	1,440	1,439	1,439	1,439	1,440	1,440	1,439
Sample Sizes (Unweighted *N*'s)	318	204	407	271	1,200	224	263	713	1,200

[a] The column totals may not sum to 1,440 due to rounding.

Source: Wiley et al. (1991).

Table 16-13. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Proximity to 2 Potential Sources of Exposure, Grouped by All Respondents, Age, and Sex

Potential Exposures	Boys									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Gasoline Fume	3	9	0	2	1	4	2	2	7	3
Gas Oven Fume	0	0	2	2	1	3	0	1	0	1
Sample Size (Unweighted *N*)	3	7	15	31	54	62	151	239	62	624
Potential Exposure	Girls									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Gasoline Fume	0	3	0	3	1	2	1	2	1	2
Gas Oven Fume	0	0	0	0	0	3	2	1	0	1
Sample Size (Unweighted *N*')	4	10	11	23	43	50	151	225	59	576

[a] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

Source: U.S. EPA analysis of source data used by Wiley et al. (1991).

Table 16-14. Mean Time (minutes/day) Children Under 12 Years of Age Spent Indoors and Outdoors, Grouped by Age and Sex

	Boys			Girls		
Age Group	*N*	Indoor[a]	Outdoor[b]	*N*	Indoor[a]	Outdoor[b]
Birth to <1 Month	3	1,440	0	4	1,440	0
1 to <3 Months	7	1,432	8	10	1,431	9
3 to <6 Months	15	1,407	33	11	1,421	19
6 to <12 Months	31	1,322	118	23	1,280	160
1 to <2 Years	54	1,101	339	43	1,164	276
2 to <3 Years	62	1,121	319	50	1,102	338
3 to <6 Years	151	1,117	323	151	1,140	300
6 to <11 Years	239	1,145	295	225	1,183	255
11 Years[c]	62	1,166	274	59	1,215	225
All Ages	624	1,181	258	576	1,181	258

[a] Time indoors was estimating by adding the average times spent performing indoor activities (household work, child care, personal needs and care, education, and communication/passive leisure) and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., work-related, goods/services, organizational activities, entertainment/social, don't know/not coded).

[b] Time outdoors was estimated by adding the average time spent in recreation activities and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., work-related, goods/services, organizational activities, entertainment/social, don't know/not coded).

[c] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

N = Sample size.

Note: Indoor and outdoor minutes/day may not sum to 1,440 minutes/day due to rounding.

Source: U.S. EPA analysis of source data used by Wiley et al. (1991).

Table 16-15. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined Whole Population and Doers Only, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Kitchen—Whole Population															
Birth to <1	63	36	0	0	0	0	0	0	10	70	109	125	134	158	195
1 to <2	118	56	0	0	0	0	0	0	40	90	132	195	232	242	392
2 to <3	118	48	0	0	0	0	0	0	30	75	120	146	173	188	215
3 to <6	357	47	0	0	0	0	0	0	30	75	105	150	180	222	362
6 to <11	497	42	0	0	0	0	0	0	30	60	105	135	150	196	690
11 to <16	466	37	0	0	0	0	0	0	24	55	90	130	180	249	450
16 to <21	481	34	0	0	0	0	0	0	15	50	90	130	170	195	545
Kitchen—Doers Only															
Birth to <1	33	69	10	10	10	13	15	30	70	90	124	133	157	176	195
1 to <4	76	87	10	10	13	19	30	45	70	110	173	214	240	281	392
2 to <3	80	70	10	10	11	15	15	30	60	105	136	155	184	195	215
3 to <6	252	67	2	5	10	15	15	30	60	90	133	165	210	232	362
6 to <11	342	61	1	2	5	10	15	30	50	79	120	145	172	229	690
11 to <16	323	54	1	2	4	5	10	20	40	65	114	150	218	281	450
16 to <21	305	54	1	2	3	5	10	20	35	65	120	159	194	209	545
Living Room/Family Room/Den—Whole Population															
Birth to <1	63	279	0	0	0	0	0	90	210	420	666	724	788	938	1,180
1 to <2	118	172	0	0	0	0	0	25	120	279	410	533	616	652	810
2 to <3	118	173	0	0	0	0	0	56	138	239	346	499	599	680	1,125
3 to <6	357	164	0	0	0	0	0	45	122	240	376	476	680	742	900
6 to <11	497	137	0	0	0	0	0	30	95	210	322	420	547	612	695
11 to <16	466	170	0	0	0	0	0	36	120	240	395	570	687	774	1,305
16 to <21	481	157	0	0	0	0	0	0	120	240	370	501	690	819	1,080
Living Room/Family Room/Den—Doers Only															
Birth to <1	54	326	25	28	31	57	90	136	268	450	686	744	789	973	1,180
1 to <2	93	219	10	15	19	25	60	90	180	310	444	540	642	667	810
2 to <3	105	195	1	5	10	22	34	90	150	255	377	527	603	691	1,125
3 to <6	290	202	5	8	19	30	50	90	153	270	415	498	705	778	900
6 to <11	403	169	5	10	10	20	30	60	130	240	349	449	579	655	695
11 to <16	380	209	2	10	16	30	45	85	165	275	436	594	705	776	1,305
16 to <21	352	214	5	10	15	24	40	85	165	285	440	547	720	909	1,080
Dining Room—Whole Population															
Birth to <1	63	9	0	0	0	0	0	0	0	0	30	70	86	96	105
1 to <2	118	19	0	0	0	0	0	0	0	17	60	90	176	260	315
2 to <3	118	19	0	0	0	0	0	0	0	30	80	105	118	146	150
3 to <6	357	17	0	0	0	0	0	0	0	10	60	96	133	150	300
6 to <11	497	13	0	0	0	0	0	0	0	5	57	70	120	135	225
11 to <16	466	11	0	0	0	0	0	0	0	0	33	65	119	164	390
16 to <21	481	7	0	0	0	0	0	0	0	0	30	45	90	112	330
Dining Room—Doers Only															
Birth to <1	9	60	15	-	-	-	-	-	-	-	-	-	-	-	105
1 to <2	32	72	10	12	13	16	30	34	53	66	110	237	287	301	315
2 to <3	34	65	15	15	15	18	29	30	60	90	105	134	150	150	150
3 to <6	93	65	10	10	10	15	16	30	55	85	120	150	209	286	300
6 to <11	126	53	5	5	5	6	15	30	45	60	98	135	150	196	225
11 to <16	90	59	5	5	5	10	15	30	38	69	122	166	202	283	390
16 to <21	67	50	5	5	7	15	15	20	35	60	90	124	135	201	330

Table 16-15. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined Whole Population and Doers Only, Children <21 Years (continued)

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Bathroom—Whole Population															
Birth to <1	63	16	0	0	0	0	0	0	0	30	40	59	81	87	90
1 to <2	118	26	0	0	0	0	0	0	15	30	45	60	80	239	600
2 to <3	118	29	0	0	0	0	0	1	20	30	60	62	138	290	345
3 to <6	357	22	0	0	0	0	0	0	15	30	49	65	90	120	270
6 to <11	497	22	0	0	0	0	0	0	15	30	45	60	81	118	535
11 to <16	466	20	0	0	0	0	0	0	15	30	45	60	86	97	220
16 to <21	481	26	0	0	0	0	0	10	20	32	59	65	105	123	547
Bathroom—Doers Only															
Birth to <1	31	32	5	7	8	10	15	18	30	40	60	78	87	89	90
1 to <2	77	39	6	6	8	10	15	15	30	30	57	60	176	349	600
2 to <3	88	38	2	3	5	12	15	15	30	45	60	70	208	319	345
3 to <6	240	33	1	1	2	5	11	15	30	38	60	75	112	123	270
6 to <11	356	31	1	2	3	5	9	15	25	35	50	60	90	180	535
11 to <16	335	29	1	2	2	5	6	12	20	35	50	64	90	100	220
16 to <21	392	31	1	2	5	5	10	15	25	40	60	72	111	135	547
Bedroom—Whole Population															
Birth to <1	63	749	0	0	104	468	566	653	750	863	972	1,092	1,119	1,179	1,275
1 to <2	118	771	0	56	340	443	559	645	808	884	975	1,029	1,190	1,325	1,440
2 to <3	118	701	0	5	91	419	517	618	718	835	894	931	979	990	1,040
3 to <6	357	696	0	92	210	432	540	630	695	790	875	945	1,033	1,135	1,440
6 to <11	497	653	0	0	0	304	480	585	660	735	840	906	1,005	1,096	1,440
11 to <16	466	626	0	0	20	134	403	543	645	745	860	950	1,027	1,118	1,277
16 to <21	481	588	0	0	0	60	335	475	595	720	855	960	1,082	1,146	1,375
Bedroom—Doers Only															
Birth to <1	61	774	435	453	470	495	590	660	750	865	975	1,095	1,119	1,182	1,275
1 to <2	116	785	330	362	384	450	570	656	810	885	975	1,030	1,191	1,328	1,440
2 to <3	116	713	30	215	266	484	520	620	720	836	896	931	981	990	1,040
3 to <6	353	704	165	210	268	464	540	630	695	790	875	945	1,034	1,137	1,440
6 to <11	486	667	120	183	261	439	513	599	660	735	843	912	1,005	1,100	1,440
11 to <16	457	638	15	55	115	179	430	550	646	750	860	951	1,029	1,122	1,277
16 to <21	463	611	15	34	100	273	395	480	600	725	859	974	1,090	1,147	1,375
Garage—Whole Population															
Birth to <1	63	1	0	0	0	0	0	0	0	0	0	0	0	34	89
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 to <6	357	1	0	0	0	0	0	0	0	0	0	0	0	7	165
6 to <11	497	0	0	0	0	0	0	0	0	0	0	0	0	0	120
11 to <16	466	2	0	0	0	0	0	0	0	0	0	0	19	51	240
16 to <21	481	0	0	0	0	0	0	0	0	0	0	0	0	0	60
Garage—Doers Only															
Birth to <1	1	-	89	-	-	-	-	-	-	-	-	-	-	-	89
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 to <6	4	-	15	-	-	-	-	-	-	-	-	-	-	-	165
6 to <11	3	-	30	-	-	-	-	-	-	-	-	-	-	-	120
11 to <16	12	79	10	11	11	13	16	20	40	139	183	210	228	234	240
16 to <21	4	-	10	-	-	-	-	-	-	-	-	-	-	-	60

Table 16-15. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined Whole Population and Doers Only, Children <21 Years (continued)

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
All Rooms Combined—Whole Population															
Birth to <1	63	1,091	0	391	631	742	786	943	1,105	1,258	1,440	1,440	1,440	1,440	1,440
1 to <2	118	1,047	0	63	377	651	705	915	1,050	1,239	1,440	1,440	1,440	1,440	1,440
2 to <3	118	971	0	66	342	640	727	852	995	1,120	1,232	1,295	1,354	1,369	1,440
3 to <6	357	951	0	284	402	621	716	810	930	1,110	1,245	1,354	1,440	1,440	1,440
6 to <11	497	873	0	0	0	420	631	758	880	1,005	1,175	1,275	1,374	1,440	1,440
11 to <16	466	876	0	0	117	370	575	751	871	1,043	1,215	1,314	1,440	1,440	1,440
16 to <21	481	819	0	0	165	375	510	645	810	995	1,170	1,287	1,419	1,440	1,440
All Rooms Combined—Doers Only															
Birth to <1	62	1,108	630	633	658	751	821	956	1,108	1,259	1,440	1,440	1,440	1,440	1,440
1 to <2	116	1,065	370	399	495	674	715	923	1,050	1,243	1,440	1,440	1,440	1,440	1,440
2 to <3	117	979	30	288	551	650	746	857	1,005	1,120	1,232	1,296	1,355	1,369	1,440
3 to <6	355	957	150	352	451	634	720	810	930	1,110	1,245	1,355	1,440	1,440	1,440
6 to <11	486	893	190	335	389	541	655	765	885	1,009	1,177	1,275	1,385	1,440	1,440
11 to <16	459	889	40	141	300	441	590	758	875	1,046	1,218	1,315	1,440	1,440	1,440
16 to <21	473	833	85	206	321	433	525	660	815	1,000	1,170	1,288	1,420	1,440	1,440

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only

Kitchen

Category	Population Group	*N*	Mean	SD	SE	Min	Max	Percentiles							
								5	25	50	75	90	95	98	99
All		7,063	92.6	94.2	1.1	1	1,320	10	30	60	120	205	270	365	460
Sex	Male	2,988	75.0	80.8	1.5	1	840	10	30	55	90	155	215	300	392
Sex	Female	4,072	105.6	101.0	1.6	1	1,320	10	35	75	145	230	295	395	475
Sex	Refused	3	40.0	31.2	18.0	15	75	15	15	30	75	75	75	75	75
Age (years)	-	144	102.7	110.8	9.2	5	840	15	30	70	130	215	260	485	540
Age (years)	1 to 4	335	73.7	54.4	3.0	5	392	15	30	60	100	140	180	225	240
Age (years)	5 to 11	477	60.5	53.0	2.4	1	690	10	30	50	75	120	150	180	235
Age (years)	12 to 17	396	55.0	58.1	2.9	1	450	5	15	36	65	125	155	240	340
Age (years)	18 to 64	4,531	90.3	90.9	1.4	1	1,320	10	30	60	120	200	260	345	420
Age (years)	>64	1,180	131.4	119.6	3.5	3	825	15	49	100	172	275	360	490	620
Race	White	5,827	95.1	95.2	1.2	1	840	10	30	65	120	210	273	380	465
Race	Black	641	79.4	92.0	3.6	2	1,320	10	30	60	100	175	230	275	380
Race	Asian	113	89.4	95.5	9.0	5	690	10	30	75	115	150	220	265	650
Race	Some Others	119	69.1	60.8	5.6	2	315	7	30	55	90	150	195	210	315
Race	Hispanic	266	84.2	77.3	4.7	1	585	10	30	60	110	190	240	305	360
Race	Refused	97	90.3	113.6	11.5	5	880	7	30	60	90	190	275	480	880
Hispanic	No	6,458	93.4	94.8	1.2	1	1,320	10	30	60	120	210	270	370	460
Hispanic	Yes	497	83.9	82.9	3.7	1	675	10	30	60	110	180	240	315	415
Hispanic	DK	32	82.3	71.9	12.7	5	300	10	35	60	113	185	240	300	300
Hispanic	Refused	76	88.4	118.6	13.6	5	880	7	30	60	90	190	240	480	880
Employment	-	1,200	62.3	55.4	1.6	1	690	10	30	50	85	125	153	213	260
Employment	Full Time	2,965	77.7	77.5	1.4	1	840	10	30	60	100	165	225	300	376
Employment	Part Time	608	97.7	94.0	3.8	1	755	10	30	70	134	213	270	405	445
Employment	Not Employed	2,239	126.9	115.8	2.4	1	1,320	12	45	95	175	270	342	470	545
Employment	Refused	51	106.4	168.5	23.6	2	880	5	30	48	130	210	250	840	880
Education	-	1,346	63.9	62.3	1.7	1	880	10	30	50	85	130	165	235	285
Education	< High School	678	108.1	102.9	4.0	1	775	10	34	80	150	230	295	405	545
Education	High School Graduate	2,043	107.2	102.3	2.3	1	840	10	35	75	150	235	300	415	500
Education	< College	1,348	94.4	101.2	2.8	1	1,320	10	30	60	120	210	280	380	450
Education	College Graduate	933	91.9	92.1	3.0	2	840	10	30	60	120	200	261	330	410
Education	Post Graduate	715	88.2	87.7	3.3	1	770	10	30	60	113	190	260	380	405
Census Region	Northeast	1,645	99.6	99.7	2.5	1	840	10	30	70	130	210	300	390	465
Census Region	Midwest	1,601	96.1	93.6	2.3	1	833	10	30	65	125	213	270	355	450
Census Region	South	2,383	86.3	87.1	1.8	1	880	10	30	60	115	190	245	330	420
Census Region	West	1,434	91.4	99.1	2.6	1	1,320	10	30	60	119	195	255	380	480
Day Of Week	Weekday	4,849	90.1	92.2	1.3	1	1,320	10	30	60	119	195	255	360	450
Day Of Week	Weekend	2,214	98.3	98.2	2.1	1	840	10	30	66	135	220	280	390	480
Season	Winter	1,938	96.6	100.3	2.3	1	1,320	10	30	65	120	210	285	390	485
Season	Spring	1,780	89.0	90.2	2.1	1	840	10	30	60	120	195	255	350	420
Season	Summer	1,890	89.3	91.0	2.1	1	880	10	30	60	120	195	255	362	430
Season	Fall	1,455	96.2	94.5	2.5	1	770	10	30	65	125	210	275	375	470
Asthma	No	6,510	92.4	93.6	1.2	1	1,320	10	30	60	120	205	270	365	450
Asthma	Yes	503	94.0	96.0	4.3	1	785	10	30	60	120	210	270	345	450
Asthma	DK	50	104.4	143.7	20.3	7	880	10	30	60	120	195	240	713	880
Angina	No	6,798	91.6	93.0	1.1	1	1,320	10	30	60	120	200	265	360	450
Angina	Yes	207	122.5	111.4	7.7	4	657	10	45	100	155	255	360	415	620
Angina	DK	58	105.9	138.4	18.2	2	880	10	30	60	135	240	240	545	880
Bronchitis/Emphysema	No	6,671	91.8	92.6	1.1	1	1,320	10	30	60	120	200	265	360	445
Bronchitis/Emphysema	Yes	338	104.8	113.4	6.2	1	825	10	30	71	135	225	300	480	657
Bronchitis/Emphysema	DK	54	117.9	142.4	19.4	2	880	10	30	76	160	240	275	545	880

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

		Bathroom													
								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		6,661	35.0	48.8	0.6	1	870	5	15	25	40	60	90	137	255
Sex	Male	3,006	32.7	50.4	0.9	1	870	5	15	21	35	60	75	150	300
Sex	Female	3,653	36.9	47.4	0.8	1	665	5	15	30	45	70	90	135	240
Sex	Refused	2	27.5	3.5	2.5	25	30	25	25	28	30	30	30	30	30
Age (years)	-	122	43.9	67.0	6.1	2	530	5	15	30	45	85	120	300	360
Age (years)	1 to 4	328	35.9	46.5	2.6	1	600	10	15	30	40	60	75	125	270
Age (years)	5 to 11	490	31.0	38.6	1.7	1	535	5	15	27	35	53	60	100	200
Age (years)	12 to 17	445	29.1	32.9	1.6	1	547	5	15	20	35	60	65	90	100
Age (years)	18 to 64	4,486	34.5	46.1	0.7	1	665	5	15	25	40	60	90	135	250
Age (years)	>64	790	42.2	69.4	2.5	1	870	5	15	30	45	75	120	240	360
Race	White	5,338	34.3	48.6	0.7	1	870	5	15	25	40	60	85	135	255
Race	Black	711	36.9	39.6	1.5	1	460	5	15	30	45	70	98	135	186
Race	Asian	117	33.6	41.4	3.8	5	375	5	15	25	40	60	90	110	210
Race	Some Others	134	47.3	69.6	6.0	1	535	5	15	30	45	95	120	315	422
Race	Hispanic	283	38.6	61.5	3.7	1	546	5	15	24	45	60	80	270	425
Race	Refused	78	34.6	49.2	5.6	3	360	5	10	20	35	60	135	165	360
Hispanic	No	6,067	34.5	45.9	0.6	1	705	5	15	25	40	60	90	135	240
Hispanic	Yes	498	39.2	68.6	3.1	1	870	5	15	25	45	60	90	270	425
Hispanic	DK	33	44.4	72.3	12.6	5	422	10	15	30	45	60	120	422	422
Hispanic	Refused	63	44.1	95.2	12.0	3	665	5	10	20	35	60	150	360	665
Employment	-	1,240	32.0	39.7	1.1	1	600	5	15	30	35	60	70	100	180
Employment	Full Time	3,130	33.4	44.8	0.8	1	595	5	15	25	40	60	80	123	240
Employment	Part Time	583	35.5	43.9	1.8	1	430	5	15	29	45	60	90	140	270
Employment	Not Employed	1,661	40.2	61.6	1.5	1	870	5	15	30	45	75	110	210	340
Employment	Refused	47	34.7	54.8	8.0	3	360	5	15	25	30	55	75	360	360
Education	-	1,386	32.2	42.8	1.1	1	665	5	15	25	35	60	70	110	200
Education	< High School	522	40.9	64.5	2.8	1	870	5	15	30	45	70	100	240	350
Education	High School Graduate	1,857	35.8	50.2	1.2	1	600	5	15	25	40	63	90	135	270
Education	< College	1,305	36.1	44.1	1.2	1	540	5	15	25	45	70	95	150	225
Education	College Graduate	913	35.0	54.1	1.8	1	705	5	15	20	40	60	90	150	340
Education	Post Graduate	678	32.1	42.8	1.6	1	460	5	15	22	40	60	75	110	300
Census Region	Northeast	1,497	34.3	51.2	1.3	1	600	5	15	25	40	60	80	140	335
Census Region	Midwest	1,465	35.8	54.5	1.4	1	870	5	15	25	40	60	90	145	315
Census Region	South	2,340	35.1	42.0	0.9	1	510	5	15	30	40	60	90	135	214
Census Region	West	1,359	34.9	50.4	1.4	1	705	5	15	25	40	60	90	140	250
Day Of Week	Weekday	4,613	33.9	46.7	0.7	1	870	5	15	25	40	60	85	135	240
Day Of Week	Weekend	2,048	37.5	53.2	1.2	1	600	5	15	30	45	65	90	150	300
Season	Winter	1,853	37.0	50.7	1.2	1	665	5	15	30	42	65	90	150	270
Season	Spring	1,747	36.6	50.5	1.2	1	870	5	15	30	45	60	90	135	240
Season	Summer	1,772	32.8	44.5	1.1	1	570	5	15	25	38	60	80	135	210
Season	Fall	1,289	33.0	49.1	1.4	1	540	5	11	20	35	60	90	140	303
Asthma	No	6,132	34.9	48.8	0.6	1	870	5	15	25	40	60	90	135	255
Asthma	Yes	493	35.2	38.2	1.7	1	410	5	15	30	45	65	90	140	220
Asthma	DK	36	49.5	121.1	20.2	3	665	5	10	18	30	60	360	665	665
Angina	No	6,473	34.6	46.8	0.6	1	870	5	15	25	40	60	90	135	240
Angina	Yes	145	51.9	88.3	7.3	3	600	7	20	30	45	75	185	546	570
Angina	DK	43	44.9	111.2	17.0	3	665	5	10	15	30	50	110	665	665
Bronchitis/Emphysema	No	6,327	34.8	48.1	0.6	1	870	5	15	25	40	60	90	135	255
Bronchitis/Emphysema	Yes	296	36.8	47.5	2.8	1	600	5	15	30	44	60	90	180	250
Bronchitis/Emphysema	DK	38	54.6	122.7	19.9	3	665	5	10	17.5	30	110	360	665	665

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

								Bedroom								
								Percentiles								
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		9,151	563.1	184.6	1.9	3	1,440	300	460	540	660	780	880	1,005	1,141
Sex	Male	4,157	549.6	183.0	2.8	3	1,440	285	450	540	640	780	860	980	1,095
Sex	Female	4,990	574.3	185.3	2.6	5	1,440	312	470	555	660	790	900	1,030	1,185
Sex	Refused	4	648.8	122.8	61.4	540	785	540	545	635	753	785	785	785	785
Age (years)	-	184	525.1	193.5	14.3	15	1,440	195	420	513	600	720	860	950	1,295
Age (years)	1 to 4	488	742.0	167.1	7.6	30	1,440	489	635	740	840	930	990	1,095	1,200
Age (years)	5 to 11	689	669.1	162.9	6.2	35	1,440	435	600	665	740	840	915	1,065	1,140
Age (years)	12 to 17	577	636.2	210.9	8.8	15	1,375	165	542	645	750	875	970	1,040	1,210
Age (years)	18 to 64	5,891	532.7	173.0	2.3	3	1,440	295	440	520	610	723	820	975	1,110
Age (years)	>64	1,322	550.8	172.0	4.7	15	1,440	315	475	540	610	735	840	1,000	1,140
Race	White	7,403	553.4	175.9	2.0	3	1,440	300	455	540	640	760	850	975	1,105
Race	Black	923	612.3	219.9	7.2	15	1,440	300	480	597	725	895	990	1,160	1,323
Race	Asian	153	612.3	187.4	15.2	25	1,285	345	510	600	705	830	950	1,005	1,245
Race	Some Others	174	590.7	200.2	15.2	15	1,405	300	464	580	700	830	960	1,050	1,152
Race	Hispanic	378	602.6	214.4	11.0	25	1,440	265	480	588	720	865	958	1,095	1,213
Race	Refused	120	555.8	198.6	18.1	30	1,405	285	440	534	630	763	875	1,290	1,295
Hispanic	No	8,326	560.9	182.6	2.0	3	1,440	300	460	540	650	780	870	1,000	1,140
Hispanic	Yes	684	597.4	206.3	7.9	15	1,440	300	480	585	713	840	958	1,095	1,200
Hispanic	DK	43	542.3	169.9	25.9	135	1,002	300	420	555	660	756	830	1,002	1,002
Hispanic	Refused	98	523.4	180.2	18.2	30	1,295	255	415	515	600	735	795	930	1,295
Employment	-	1,736	679.5	185.5	4.5	15	1,440	390	590	675	785	892	960	1,065	1,170
Employment	Full Time	3,992	513.5	157.6	2.5	3	1,440	283	435	510	585	680	765	890	1,000
Employment	Part Time	777	551.6	169.4	6.1	15	1,335	330	455	540	630	750	835	1,005	1,100
Employment	Not Employed	2,578	566.4	191.2	3.8	5	1,440	300	478	540	650	780	905	1,095	1,223
Employment	Refused	68	514.0	209.6	25.4	30	1,440	210	420	498	585	725	795	1,200	1,440
Education	-	1,925	668.3	188.8	4.3	15	1,440	360	575	663	780	885	960	1,060	1,170
Education	< High School	807	554.8	180.6	6.4	5	1,440	300	450	540	630	775	860	1,015	1,160
Education	High School Graduate	2,549	534.1	176.2	3.5	3	1,440	285	447	520	607	720	835	975	1,151
Education	< College	1,740	539.1	176.1	4.2	5	1,440	282	450	530	615	735	825	1,005	1,135
Education	College Graduate	1,223	526.0	164.9	4.7	15	1,404	300	445	515	600	713	785	965	1,070
Education	Post Graduate	907	525.2	160.6	5.3	3	1,355	315	445	510	600	690	780	950	1,095
Census Region	Northeast	2,037	561.5	185.3	4.1	5	1,440	300	457	540	655	781	885	1,020	1,139
Census Region	Midwest	2,045	552.4	179.2	4.0	3	1,440	280	450	540	643	765	860	965	1,035
Census Region	South	3,156	570.0	186.4	3.3	10	1,440	300	465	552	660	790	900	1,055	1,155
Census Region	West	1,913	564.9	186.4	4.3	5	1,440	305	460	540	660	793	875	995	1,152
Day Of Week	Weekday	6,169	552.6	174.5	2.2	3	1,440	325	450	539	635	760	855	975	1,130
Day Of Week	Weekend	2,982	584.9	202.4	3.7	3	1,440	223	480	570	690	825	920	1,055	1,170
Season	Winter	2,475	576.0	183.8	3.7	5	1,440	305	475	555	660	805	900	1,035	1,148
Season	Spring	2,365	559.0	176.7	3.6	15	1,440	315	455	540	655	770	855	960	1,095
Season	Summer	2,461	566.1	195.2	3.9	3	1,440	285	455	545	660	810	900	1,030	1,190
Season	Fall	1,850	547.2	179.9	4.2	3	1,440	270	450	538	630	750	850	960	1,100
Asthma	No	8,420	560.8	182.8	2.0	3	1,440	300	460	540	655	780	870	1,000	1,140
Asthma	Yes	671	593.8	201.5	7.8	30	1,440	300	475	580	690	835	946	1,060	1,327
Asthma	DK	60	543.1	218.4	28.2	30	1,295	223	423	540	605	760	983	1,275	1,295
Angina	No	8,836	564.2	183.9	2.0	3	1,440	300	460	540	660	785	880	1,005	1,140
Angina	Yes	244	535.5	203.9	13.1	20	1,440	215	450	523	613	770	840	1,135	1,230
Angina	DK	71	522.1	193.9	23.0	30	1,295	180	420	540	600	690	820	990	1,295
Bronchitis/Emphysema	No	8,660	563.1	184.2	2.0	3	1,440	300	460	540	660	780	880	1,005	1,141
Bronchitis/Emphysema	Yes	423	570.1	192.0	9.3	15	1,440	294	450	555	660	795	900	1,055	1,110
Bronchitis/Emphysema	DK	68	524.8	186.7	22.6	30	1,295	240	420	540	600	700	820	930	1,295

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

Garage																
								Percentiles								
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		193	117.8	144.5	10.4	1	790	5	20	60	150	296	480	665	690
Sex	Male	120	144.1	162.6	14.8	2	790	10	30	94	183	315	518	675	690
Sex	Female	73	74.6	94.3	11.0	1	530	5	15	30	120	180	240	450	530
Age (years)	-	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Age (years)	1 to 4	4	83.5	47.5	23.7	15	120	15	52	100	115	120	120	120	120
Age (years)	5 to 11	6	63.3	63.4	25.9	10	165	10	25	30	120	165	165	165	165
Age (years)	12 to 17	12	80.8	78.4	22.6	10	240	10	20	51	148	185	240	240	240
Age (years)	18 to 64	130	134.5	165.1	14.5	1	790	5	20	68	180	360	526	675	690
Age (years)	>64	40	88.6	84.1	13.3	5	300	8	25	60	143	228	270	300	300
Race	White	165	109.5	127.5	9.9	1	690	5	20	60	135	240	315	526	675
Race	Black	12	205.0	219.5	63.4	5	570	5	38	90	405	530	570	570	570
Race	Asian	1	5.0	-	-	5	5	5	5	5	5	5	5	5	5
Race	Some Others	6	186.3	308.4	125.9	10	790	10	18	30	240	790	790	790	790
Race	Hispanic	8	120.0	164.9	58.3	15	510	15	23	60	135	510	510	510	510
Race	Refused	1	120.0	-	-	120	120	120	120	120	120	120	120	120	120
Hispanic	No	174	116.6	138.5	10.5	1	690	5	20	60	155	296	460	570	675
Hispanic	Yes	17	128.6	207.3	50.3	5	790	5	20	60	110	510	790	790	790
Hispanic	Refused	2	127.5	10.6	7.5	120	135	120	120	128	135	135	135	135	135
Employment	-	21	79.7	67.5	14.7	10	240	15	25	51	120	165	185	240	240
Employment	Full Time	85	145.3	175.2	19.0	1	790	5	20	65	180	405	530	675	790
Employment	Part Time	17	50.1	52.0	12.6	5	194	5	15	30	60	135	194	194	194
Employment	Not Employed	70	112.3	127.4	15.2	5	690	5	30	75	135	255	450	480	690
Education	-	22	76.5	67.6	14.4	10	240	10	20	51	120	165	185	240	240
Education	< High School	14	188.9	195.0	52.1	5	675	5	30	120	235	510	675	675	675
Education	High School Graduate	63	127.3	159.3	20.1	2	690	5	25	60	165	300	530	665	690
Education	< College	48	121.6	147.8	21.3	5	790	10	30	60	140	296	450	790	790
Education	College Graduate	25	118.2	145.8	29.2	5	480	5	20	60	120	405	460	480	480
Education	Post Graduate	21	75.9	88.1	19.2	1	300	2	10	30	120	195	260	300	300
Census Region	Northeast	23	137.2	159.5	33.2	5	510	15	30	60	195	460	510	510	510
Census Region	Midwest	42	131.4	166.4	25.7	10	690	20	40	88	120	260	665	690	690
Census Region	South	60	103.7	128.6	16.6	2	570	5	13	53	128	283	428	480	570
Census Region	West	68	115.3	139.7	16.9	1	790	5	20	73	153	300	315	530	790
Day Of Week	Weekday	116	128.7	159.0	14.8	1	790	5	25	60	165	315	510	665	690
Day Of Week	Weekend	77	101.4	118.4	13.5	2	675	10	20	60	120	240	300	526	675
Season	Winter	51	115.6	161.8	22.7	2	690	5	15	50	150	240	526	665	690
Season	Spring	59	136.8	163.3	21.3	5	790	10	30	90	165	315	570	675	790
Season	Summer	51	101.1	121.3	17.0	1	530	5	20	60	120	260	450	460	530
Season	Fall	32	112.9	110.2	19.5	5	480	10	25	85	158	240	315	480	480
Asthma	No	184	118.6	146.3	10.8	1	790	5	25	60	150	300	480	665	690
Asthma	Yes	9	101.1	102.6	34.2	5	270	5	15	60	180	270	270	270	270
Angina	No	187	118.2	146.2	10.7	1	790	5	20	60	150	300	480	665	690
Angina	Yes	6	104.2	78.6	32.1	10	220	10	25	110	150	220	220	220	220
Bronchitis/Emphysema	No	185	114.1	142.9	10.5	1	790	5	20	60	135	260	480	665	690
Bronchitis/Emphysema	Yes	8	201.9	163.6	57.9	15	450	15	60	178	338	450	450	450	450

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

Basement

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		274	142.2	162.9	9.8	1	931	10	30	90	180	330	535	705	765
Sex	Male	132	160.4	180.7	15.7	1	931	10	40	90	203	490	565	720	765
Sex	Female	141	125.7	143.3	12.1	2	810	10	30	75	175	265	420	705	720
Sex	Refused	1	60.0	-	-	60	60	60	60	60	60	60	60	60	60
Age (years)	-	3	171.7	122.7	70.8	30	245	30	30	240	245	245	245	245	245
Age (years)	1 to 4	8	94.8	55.7	19.7	28	180	28	48	90	138	180	180	180	180
Age (years)	5 to 11	25	135.4	145.9	29.2	15	705	15	60	105	140	270	420	705	705
Age (years)	12 to 17	26	97.5	113.1	22.2	1	515	10	30	60	150	240	275	515	515
Age (years)	18 to 64	170	151.3	172.7	13.2	1	810	5	30	90	210	410	555	720	765
Age (years)	>64	42	143.8	173.5	26.8	5	931	10	40	90	170	330	455	931	931
Race	White	248	133.8	154.1	9.8	1	810	10	30	90	168	315	510	705	720
Race	Black	15	183.8	165.5	42.7	12	515	12	40	150	270	450	515	515	515
Race	Asian	2	135.0	106.1	75.0	60	210	60	60	135	210	210	210	210	210
Race	Some Others	3	468.7	455.7	263.1	20	931	20	20	455	931	931	931	931	931
Race	Hispanic	1	30.0	-	-	30	30	30	30	30	30	30	30	30	30
Race	Refused	5	263.2	173.1	77.4	60	540	60	231	240	245	540	540	540	540
Hispanic	No	263	139.0	161.7	10.0	1	931	10	30	90	180	330	510	705	765
Hispanic	Yes	6	185.0	197.3	80.6	15	555	15	30	150	210	555	555	555	555
Hispanic	DK	1	185.0	-	-	185	185	185	185	185	185	185	185	185	185
Hispanic	Refused	4	271.3	198.8	99.4	60	540	60	150	243	393	540	540	540	540
Employment	-	57	115.6	124.2	16.5	1	705	12	40	90	150	240	420	515	705
Employment	Full Time	107	149.1	178.6	17.3	1	810	5	30	75	210	450	540	720	765
Employment	Part Time	22	115.0	114.8	24.5	10	535	25	60	78	150	185	290	535	535
Employment	Not Employed	85	158.0	176.3	19.1	5	931	10	35	120	210	330	600	720	931
Employment	Refused	3	151.7	110.3	63.7	30	245	30	30	180	245	245	245	245	245
Education	-	65	129.5	133.4	16.6	1	705	15	45	90	160	270	420	535	705
Education	< High School	15	169.9	203.5	52.5	5	605	5	30	90	255	565	605	605	605
Education	High School Graduate	78	159.4	188.7	21.4	5	810	5	40	90	195	420	720	765	810
Education	< College	48	160.6	184.2	26.6	2	931	10	25	120	203	400	600	931	931
Education	College Graduate	39	146.7	150.8	24.1	10	555	10	30	70	210	450	510	555	555
Education	Post Graduate	29	73.1	66.3	12.3	1	245	10	30	60	100	210	210	245	245
Census Region	Northeast	90	115.6	118.7	12.5	5	555	10	40	73	150	250	400	540	555
Census Region	Midwest	123	129.0	146.9	13.2	2	765	10	30	90	180	270	510	605	630
Census Region	South	35	188.0	205.8	34.8	10	931	28	45	110	255	450	720	931	931
Census Region	West	26	234.4	247.7	48.6	1	810	1	30	165	325	705	720	810	810
Day Of Week	Weekday	178	135.3	159.4	11.9	1	810	10	30	83	180	315	535	720	765
Day Of Week	Weekend	96	154.8	169.3	17.3	5	931	10	50	98	190	450	540	600	931
Season	Winter	80	144.5	147.0	16.4	5	630	14	30	90	221	315	480	610	630
Season	Spring	65	174.2	196.8	24.4	1	931	5	60	105	210	490	555	810	931
Season	Summer	79	142.4	180.7	20.3	1	765	5	30	85	150	455	605	720	765
Season	Fall	50	96.4	83.1	11.7	5	332	10	30	60	145	240	255	301	332
Asthma	No	253	143.1	164.2	10.3	1	931	10	35	90	180	330	540	705	765
Asthma	Yes	20	124.7	151.0	33.8	1	510	6	16	73	178	383	510	510	510
Asthma	DK	1	245.0	-	-	245	245	245	245	245	245	245	245	245	245
Angina	No	269	141.4	163.7	10.0	1	931	10	30	90	180	330	535	705	765
Angina	Yes	3	201.7	122.1	70.5	65	300	65	65	240	300	300	300	300	300
Angina	DK	2	152.5	130.8	92.5	60	245	60	60	153	245	245	245	245	245
Bronchitis/Emphysema	No	265	139.0	161.0	9.9	1	931	10	30	90	180	330	515	705	765
Bronchitis/Emphysema	Yes	8	233.8	214.2	75.7	20	605	20	68	180	375	605	605	605	605
Bronchitis/Emphysema	DK	1	245.0	-	-	245	245	245	245	245	245	245	245	245	245

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

Utility/Laundry Room

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		458	73.2	71.9	3.4	1	510	5	25	60	100	150	200	300	360
Sex	Male	70	78.4	95.7	11.4	1	510	5	20	60	90	168	345	360	510
Sex	Female	388	72.3	66.8	3.4	2	510	5	28	60	105	150	190	240	330
Age (years)	-	6	65.8	34.4	14.0	25	120	25	40	60	90	120	120	120	120
Age (years)	1 to 4	3	75.0	116.9	67.5	5	210	5	5	10	210	210	210	210	210
Age (years)	5 to 11	3	105.7	168.4	97.2	2	300	2	2	15	300	300	300	300	300
Age (years)	12 to 17	8	55.5	77.1	27.3	1	240	1	17	33	53	240	240	240	240
Age (years)	18 to 64	362	73.6	73.9	3.9	2	510	5	20	60	105	150	195	325	405
Age (years)	>64	76	72.6	58.1	6.7	2	345	10	30	60	90	150	180	245	345
Race	White	400	69.2	65.8	3.3	2	510	5	25	60	90	150	180	258	353
Race	Black	35	100.5	103.2	17.5	1	510	5	20	60	135	240	300	510	510
Race	Asian	4	82.5	37.7	18.9	30	120	30	60	90	105	120	120	120	120
Race	Some Others	6	86.7	27.9	11.4	60	120	60	65	78	120	120	120	120	120
Race	Hispanic	10	95.9	78.8	24.9	4	225	4	20	105	120	218	225	225	225
Race	Refused	3	170.0	264.2	152.5	15	475	15	15	20	475	475	475	475	475
Hispanic	No	435	72.1	69.9	3.4	1	510	5	25	60	90	150	190	300	360
Hispanic	Yes	20	81.7	63.0	14.1	4	225	5	40	60	120	183	218	225	225
Hispanic	DK	1	55.0	-	-	55	55	55	55	55	55	55	55	55	55
Hispanic	Refused	2	247.5	321.7	227.5	20	475	20	20	248	475	475	475	475	475
Employment	-	12	76.8	107.8	31.1	1	300	1	4	23	135	240	300	300	300
Employment	Full Time	206	69.2	78.4	5.5	2	510	5	20	60	90	135	203	360	405
Employment	Part Time	51	72.2	62.5	8.8	2	225	5	15	55	120	150	180	225	225
Employment	Not Employed	187	77.7	63.8	4.7	5	475	10	30	60	115	150	180	245	345
Employment	Refused	2	76.0	104.7	74.0	2	150	2	2	76	150	150	150	150	150
Education	-	17	72.0	90.9	22.0	1	300	1	10	35	90	240	300	300	300
Education	< High School	51	71.8	49.4	6.9	15	245	20	30	60	90	120	180	195	245
Education	High School Graduate	163	71.6	71.6	5.6	2	510	6	30	60	90	140	180	325	405
Education	< College	107	77.2	71.7	6.9	2	475	5	20	60	120	155	200	225	240
Education	College Graduate	60	74.0	77.3	10.0	5	510	10	27	60	98	154	190	203	510
Education	Post Graduate	60	71.3	79.9	10.3	5	360	5	18	60	90	155	263	360	360
Census Region	Northeast	105	80.9	84.6	8.3	2	510	5	25	60	120	180	225	345	360
Census Region	Midwest	116	64.9	63.3	5.9	2	475	5	15	60	90	135	155	215	240
Census Region	South	151	72.7	69.5	5.7	1	510	10	30	60	90	150	210	245	330
Census Region	West	86	75.9	69.9	7.5	4	405	5	30	60	115	150	180	360	405
Day Of Week	Weekday	322	68.6	66.7	3.7	1	510	5	23	60	90	140	180	240	345
Day Of Week	Weekend	136	84.1	82.1	7.0	5	510	10	30	60	120	180	240	360	405
Season	Winter	145	75.2	81.0	6.7	1	510	5	17	60	90	165	215	360	475
Season	Spring	89	81.9	83.0	8.8	5	510	10	30	60	100	180	240	405	510
Season	Summer	132	69.3	60.8	5.3	2	360	5	25	60	120	135	155	240	325
Season	Fall	92	67.3	58.6	6.1	3	345	10	22	60	90	125	180	245	345
Asthma	No	432	73.8	73.2	3.5	1	510	5	25	60	105	150	200	325	360
Asthma	Yes	26	64.2	44.8	8.8	10	200	10	25	60	90	120	130	200	200
Angina	No	440	72.1	70.2	3.3	1	510	5	25	60	100	150	185	270	360
Angina	Yes	16	103.1	109.9	27.5	5	360	5	30	60	138	345	360	360	360
Angina	DK	2	72.5	17.7	12.5	60	85	60	60	73	85	85	85	85	85
Bronchitis/emphysema	No	428	73.3	73.5	3.6	1	510	5	24	60	105	150	200	325	360
Bronchitis/emphysema	Yes	30	72.4	43.5	7.9	10	200	15	45	60	90	125	150	200	200

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

Indoors in a Residence (all rooms)																
								Percentiles								
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		9,343	1,001.4	275.1	2.8	8	1,440	575	795	985	1,235	1,395	1,440	1,440	1,440
Sex	Male	4,269	945.9	273.5	4.2	8	1,440	540	750	900	1,160	1,350	1,430	1,440	1,440
Sex	Female	5,070	1,048.1	267.9	3.8	30	1,440	620	840	1,050	1,280	1,420	1,440	1,440	1,440
Sex	Refused	4	1,060.0	135.6	67.8	900	1,200	900	950	1,070	1,170	1,200	1,200	1,200	1,200
Age (years)	-	187	1,001.1	279.9	20.5	265	1,440	565	799	955	1,230	1,440	1,440	1,440	1,440
Age (years)	1 to 4	498	1,211.6	218.7	9.8	270	1,440	795	1,065	1,260	1,410	1,440	1,440	1,440	1,440
Age (years)	5 to 11	700	1,005.1	222.3	8.4	190	1,440	686	845	975	1,165	1,334	1,412.5	1,440	1,440
Age (years)	12 to 17	588	969.5	241.8	10.0	95	1,440	585	812	950	1,155	1,310	1,405	1,440	1,440
Age (years)	18 to 64	6,022	947.9	273.0	3.5	8	1,440	540	750	900	1,165	1,350	1,428	1,440	1,440
Age (years)	>64	1,348	1,174.6	229.3	6.2	60	1,440	760	1,030	1,210	1,375	1,440	1,440	1,440	1,440
Race	White	7,556	999.4	275.7	3.2	8	1,440	570	795	980	1,235	1,395	1,440	1,440	1,440
Race	Black	941	1,016.0	272.5	8.9	190	1,440	600	815	1,000	1,245	1,410	1,440	1,440	1,440
Race	Asian	157	983.5	254.7	20.3	30	1,440	600	810	930	1,180	1,355	1,420	1,440	1,440
Race	Some Others	181	996.1	268.3	19.9	10	1,440	604	805	975	1,198	1,380	1,440	1,440	1,440
Race	Hispanic	382	1,009.4	281.8	14.4	55	1,440	555	810	1,005	1,250	1,410	1,440	1,440	1,440
Race	Refused	126	1,019.7	276.6	24.6	270	1,440	575	840	975	1,255	1,440	1,440	1,440	1,440
Hispanic	No	8,498	1,000.4	275.4	3.0	8	1,440	575	795	980	1,235	1,395	1,440	1,440	1,440
Hispanic	Yes	696	1,009.8	270.8	10.3	55	1,440	585	810	1,000	1,230	1,405	1,440	1,440	1,440
Hispanic	DK	46	1,097.9	286.7	42.3	401	1,440	645	835	1,173	1,355	1,440	1,440	1,440	1,440
Hispanic	Refused	103	984.1	269.5	26.6	270	1,440	565	810	950	1,200	1,375	1,440	1,440	1,440
Employment	-	1,768	1,053.3	248.5	5.9	95	1,440	675	870	1,030	1,255	1,413	1,440	1,440	1,440
Employment	Full Time	4,068	881.0	259.2	4.1	8	1,440	515	715	835	1,046	1,290	1,385	1,440	1,440
Employment	Part Time	797	982.4	243.1	8.6	255	1,440	600	820	970	1,170	1,320	1,380	1,440	1,440
Employment	Not Employed	2,639	1,158.0	233.8	4.6	60	1,440	735	1,015	1,190	1,350	1,440	1,440	1,440	1,440
Employment	Refused	71	995.1	268.1	31.8	445	1,440	575	810	940	1,255	1,440	1,440	1,440	1,440
Education	-	1,963	1,044.5	251.9	5.7	95	1,440	660	855	1,020	1,254	1,410	1,440	1,440	1,440
Education	< High School	829	1,093.4	278.6	9.7	150	1,440	630	870	1,130	1,345	1,440	1,440	1,440	1,440
Education	High School Graduate	2,602	1,008.1	279.3	5.5	30	1,440	565	803	995	1,245	1,400	1,440	1,440	1,440
Education	< College	1,788	974.3	272.6	6.4	10	1,,440	570	775	930	1,205	1,371	1,436	1,440	1,440
Education	College Graduate	1,240	939.5	275.0	7.8	30	1,440	528	745	885	1,165	1,335	1,428	1,440	1,440
Education	Post Graduate	921	943.7	274.3	9.0	8	1,440	540	750	900	1,155	1,350	1,410	1,440	1,440
Census Region	Northeast	2,068	1,003.4	278.4	6.1	30	1,440	570	795	980	1,245	1,405	1,440	1,440	1,440
Census Region	Midwest	2,087	1,001.7	280.6	6.1	8	1,440	565	790	989	1,250	1,390	1,440	1,440	1,440
Census Region	South	3,230	999.0	270.2	4.8	10	1,440	585	800	970	1,228	1,400	1,440	1,440	1,440
Census Region	West	1,958	1,002.8	274.0	6.2	30	1,440	575	800	1,000	1,230	1,390	1,440	1,440	1,440
Day Of Week	Weekday	6,286	965.7	272.6	3.4	30	1,440	567	770	911	1,190	1,380	1,440	1,440	1,440
Day Of Week	Weekend	3,057	1,074.8	265.7	4.8	8	1,440	615	895	1,105	1,290	1,420	1,440	1,440	1,440
Season	Winter	2,513	1,034.9	278.2	5.6	30	1,440	590	825	1,015	1,285	1,432	1,440	1,440	1,440
Season	Spring	2,424	977.9	267.2	5.4	10	1,440	580	780	955	1,185	1,370	1,435	1,440	1,440
Season	Summer	2,522	980.5	274.0	5.5	8	1,440	555	785	960	1,201	1,365	1,440	1,440	1,440
Season	Fall	1,884	1,014.8	277.5	6.4	30	1,440	589	805	997	1,260	1,405	1,440	1,440	1,440
Asthma	No	8,591	999.1	274.4	3.0	8	1,440	576	795	980	1,230	1,393	1,440	1,440	1,440
Asthma	Yes	689	1,027.4	284.4	10.8	190	1,440	555	825	1,025	1,260	1,430	1,440	1,440	1,440
Asthma	DK	63	1,025.7	264.3	33.3	445	1,440	630	840	960	1,315	1,410	1,440	1,440	1,440
Angina	No	9,019	997.8	274.1	2.9	8	1,440	575	795	975	1,230	1,391	1,440	1,440	1,440
Angina	Yes	249	1,125.5	281.4	17.8	180	1,440	660	925	1,185	1,380	1,440	1,440	1,440	1,440
Angina	DK	75	1,024.1	285.1	32.9	150	1,440	560	840	975	1,305	1,425	1,440	1,440	1,440
Bronchitis/Emphysema	No	8,840	997.7	274.8	2.9	8	1,440	575	795	975	1,230	1,395	1,440	1,440	1,440
Bronchitis/Emphysema	Yes	432	1,070.5	273.8	13.2	205	1,440	585	868	1,110	1,293	1,440	1,440	1,440	1,440
Bronchitis/Emphysema	DK	71	1,045.5	273.0	32.4	445	1,440	565	845	975	1,320	1,440	1,440	1,440	1,440

Table 16-16. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only (continued)

-	= Indicates missing data.
DK	= The respondent replied “don’t know”.
Refused	= Refused data.
N	= Doer sample size.
Mean	= Mean 24-hour cumulative number of minutes for doers.
SD	= Standard deviation.
SE	= Standard error.
Min	= Minimum number of minutes.
Max	= Maximum number of minutes. Percentiles are the percentage of doers below or equal to a given number of minutes.
Source:	U.S. EPA (1996).

Table 16-17. Time Spent (minutes/day) at Selected Indoor Locations Whole Population and Doers Only, Children <21 years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Restaurants—Whole Population															
Birth to <1	63	13	0	0	0	0	0	0	0	0	45	69	105	194	330
1 to <2	118	7	0	0	0	0	0	0	0	0	30	62	88	102	120
2 to <3	118	9	0	0	0	0	0	0	0	0	45	62	92	111	120
3 to <6	357	7	0	0	0	0	0	0	0	0	21	52	90	120	130
6 to <11	497	6	0	0	0	0	0	0	0	0	15	45	85	110	180
11 to <16	466	10	0	0	0	0	0	0	0	0	35	60	90	137	315
16 to <21	481	35	0	0	0	0	0	0	0	20	105	240	380	466	645
Restaurants—Doers Only															
Birth to <1	10	85	10	-	-	-	-	-	-	-	-	-	-	-	330
1 to <2	15	58	5	6	8	12	21	33	55	83	99	110	116	118	120
2 to <3	17	63	20	21	22	24	28	45	60	80	102	116	118	119	120
3 to <6	43	57	4	7	9	10	16	30	45	90	120	120	122	126	130
6 to <11	57	54	5	5	6	10	15	30	45	60	107	124	140	158	180
11 to <16	78	59	2	3	7	10	18	30	45	65	102	141	223	283	315
16 to <21	135	126	1	4	5	10	17	30	60	170	334	437	537	546	645
School—Whole Population															
Birth to <1	63	4	0	0	0	0	0	0	0	0	0	0	46	100	165
1 to <2	118	13	0	0	0	0	0	0	0	0	0	22	156	453	665
2 to <3	118	23	0	0	0	0	0	0	0	0	0	193	414	503	545
3 to <6	357	75	0	0	0	0	0	0	0	0	416	540	569	589	630
6 to <11	497	187	0	0	0	0	0	0	0	397	444	480	552	601	665
11 to <16	466	201	0	0	0	0	0	0	0	420	459	495	578	630	855
16 to <21	481	131	0	0	0	0	0	0	0	308	430	495	566	629	855
School—Doers Only															
Birth to <1	2	-	60	-	-	-	-	-	-	-	-	-	-	-	165
1 to <2	8	-	5	-	-	-	-	-	-	-	-	-	-	-	665
2 to <3	11	251	10	10	10	10	10	83	269	388	510	528	538	542	545
3 to <6	71	379	5	23	34	110	160	228	418	540	570	590	615	627	630
6 to <11	235	396	5	64	129	195	305	370	400	435	480	540	612	643	665
11 to <16	229	409	15	38	96	132	290	395	420	450	495	559	631	696	855
16 to <21	171	367	15	22	31	90	185	270	388	440	525	576	726	801	855
Grocery/Convenience Stores, Other Stores, and Malls—Whole Population															
Birth to <1	63	39	0	0	0	0	0	0	0	30	98	178	224	241	250
1 to <2	118	16	0	0	0	0	0	0	0	0	62	87	146	202	255
2 to <3	118	18	0	0	0	0	0	0	0	0	60	86	133	250	360
3 to <6	357	17	0	0	0	0	0	0	0	0	62	111	189	223	420
6 to <11	497	14	0	0	0	0	0	0	0	0	49	101	167	225	320
11 to <16	466	18	0	0	0	0	0	0	0	0	54	122	204	300	413
16 to <21	481	36	0	0	0	0	0	0	0	15	120	230	402	484	960
Grocery/Convenience Stores, Other Stores, and Malls—Doers Only															
Birth to <1	21	88	5	5	5	5	24	30	55	130	190	235	244	247	250
1 to <2	23	81	5	7	9	17	30	55	65	93	152	205	235	245	255
2 to <3	27	80	10	11	13	20	33	45	60	82	120	234	313	337	360
3 to <6	64	96	5	5	5	16	23	50	73	116	204	236	339	382	420
6 to <11	91	76	3	3	5	5	14	20	60	110	170	230	255	262	320
11 to <16	104	82	1	2	5	10	10	20	45	120	199	300	359	383	413
16 to <21	146	120	2	4	5	5	10	22	60	149	330	456	517	562	960

N = Sample size.
Min = Minimum.
Max = Maximum.
\- = Percentiles were not calculated for sample sizes less than 10.
Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only

Restaurant

Category	Population Group	*N*	Mean	SD	SE	Min	Max	Percentiles							
								5	25	50	75	90	95	98	99
All		2,059	94.5	119.9	2.6	1	925	10	30	60	95	185	351	548	660
Sex	Male	986	87.5	114.2	3.6	1	900	10	30	60	90	160	305	550	660
Sex	Female	1,073	101.0	124.7	3.8	1	925	10	40	60	105	230	380	540	670
Age (years)	-	30	126.1	138.2	25.2	15	495	30	45	60	150	398	490	495	495
Age (years)	1 to 4	61	62.7	47.7	6.1	4	330	10	35	55	85	115	120	130	330
Age (years)	5 to 11	84	56.7	38.1	4.2	5	180	10	30	45	85	120	120	140	180
Age (years)	12 to 17	122	69.8	78.4	7.1	2	455	10	30	45	65	165	250	325	360
Age (years)	18 to 64	1,503	101.2	131.2	3.4	1	925	10	30	60	105	211	400	570	675
Age (years)	>64	259	83.6	83.5	5.2	3	750	19	45	60	90	150	215	315	520
Race	White	1,747	91.7	114.7	2.7	1	925	10	30	60	95	175	320	535	640
Race	Black	148	102.8	141.3	11.6	3	805	5	30	60	95	295	430	555	735
Race	Asian	37	81.3	78.9	13.0	15	480	18	30	60	90	135	200	480	480
Race	Some Others	30	145.2	194.8	35.6	5	765	10	45	83	120	433	750	765	765
Race	Hispanic	78	123.0	156.8	17.8	10	700	15	40	60	110	375	585	660	700
Race	Refused	19	123.8	127.6	29.3	20	480	20	30	70	210	330	480	480	480
Hispanic	No	1,911	92.9	117.6	2.7	1	925	10	30	60	95	180	330	542	645
Hispanic	Yes	129	116.7	148.0	13.0	1	765	15	40	60	115	360	435	660	700
Hispanic	DK	5	76.0	134.3	60.1	5	315	5	10	10	40	315	315	315	315
Hispanic	Refused	14	114.5	134.7	36.0	30	480	30	30	60	90	330	480	480	480
Employment	-	263	62.3	57.9	3.6	2	455	10	30	45	80	120	140	273	330
Employment	Full Time	1,063	105.5	142.4	4.4	1	925	10	35	60	105	235	485	630	735
Employment	Part Time	208	122.6	144.8	10.0	1	805	5	33	65	123	320	441	595	660
Employment	Not Employed	515	76.3	61.4	2.7	3	490	15	40	60	90	145	195	260	315
Employment	Refused	10	135.0	133.5	42.2	30	425	30	60	83	135	378	425	425	425
Education	-	299	72.2	79.6	4.6	1	548	10	30	50	85	130	250	360	480
Education	< High School	132	134.8	171.8	15.0	5	925	10	30	60	152	375	535	700	750
Education	High School Graduate	590	99.4	136.3	5.6	3	910	10	35	60	90	203	435	645	680
Education	< College	431	94.9	114.9	5.5	1	770	10	35	60	105	180	340	550	640
Education	College Graduate	359	89.5	104.1	5.5	1	765	10	35	60	100	165	295	490	570
Education	Post Graduate	248	95.0	109.4	6.9	3	765	15	40	60	115	180	260	560	675
Census Region	Northeast	409	94.4	113.6	5.6	2	765	15	35	60	100	210	330	507	585
Census Region	Midwest	504	96.9	120.9	5.4	1	805	10	30	60	105	190	340	560	675
Census Region	South	680	92.7	125.1	4.8	2	910	10	30	60	90	195	365	550	650
Census Region	West	466	94.9	116.9	5.4	1	925	10	30	60	110	175	375	535	640
Day Of Week	Weekday	1,291	97.3	128.8	3.6	1	925	10	30	60	93	210	377	555	700
Day Of Week	Weekend	768	89.8	103.2	3.7	1	770	10	36	60	105	155	280	510	620
Season	Winter	524	97.7	125.7	5.5	3	875	15	35	60	105	178	351	595	685
Season	Spring	559	91.6	109.7	4.6	2	925	10	35	60	95	180	360	505	555
Season	Summer	556	95.1	123.0	5.2	1	910	10	30	60	94	210	360	555	675
Season	Fall	420	93.6	121.7	5.9	1	900	10	30	60	95	185	325	540	653
Asthma	No	1,903	94.1	117.4	2.7	1	910	10	35	60	100	180	330	545	653
Asthma	Yes	150	96.3	143.6	11.7	4	925	10	30	46	90	238	485	590	670
Asthma	DK	6	196.3	220.9	90.2	30	480	30	30	79	480	480	480	480	480
Angina	No	1,998	94.9	120.7	2.7	1	925	10	30	60	100	190	355	550	660
Angina	Yes	50	69.0	53.6	7.6	3	340	15	45	60	90	105	120	286	340
Angina	DK	11	140.3	171.3	51.6	30	480	30	30	70	120	480	480	480	480
Bronchitis/Emphysema	No	1,945	93.7	117.7	2.7	1	910	10	30	60	97	180	335	548	653
Bronchitis/Emphysema	Yes	104	96.1	130.1	12.8	5	925	15	30	60	90	235	360	500	620
Bronchitis/Emphysema	DK	10	232.8	288.2	91.1	10	875	10	30	79	480	678	875	875	875

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at Bar/Nightclub/Bowling Alley

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		352	175.8	132.2	7.0	3	870	30	90	150	223	328	487	570	615
Sex	Male	213	174.3	133.2	9.1	5	870	30	90	140	220	340	479	568	615
Sex	Female	139	178.1	131.2	11.1	3	630	30	95	150	225	300	530	600	605
Age (years)	-	4	158.8	98.0	49.0	75	300	75	98	130	220	300	300	300	300
Age (years)	5 to 11	4	98.8	57.5	28.8	45	170	45	53	90	145	170	170	170	170
Age (years)	12 to 17	8	151.3	77.7	27.5	50	270	50	80	160	205	270	270	270	270
Age (years)	18 to 64	313	180.2	136.7	7.7	3	870	30	90	150	225	370	498	590	615
Age (years)	>64	23	141.2	85.2	17.8	5	328	30	75	135	180	240	325	328	328
Race	White	297	173.6	132.6	7.7	3	870	30	90	140	220	328	487	590	630
Race	Black	25	205.4	126.6	25.3	50	540	60	120	180	240	417	498	540	540
Race	Asian	8	169.9	153.3	54.2	5	479	5	38	175	225	479	479	479	479
Race	Some Others	7	197.3	187.6	70.9	70	615	70	110	135	185	615	615	615	615
Race	Hispanic	10	121.3	52.3	16.5	5	198	5	105	118	160	179	198	198	198
Race	Refused	5	246.6	127.2	56.9	73	410	73	180	270	300	410	410	410	410
Hispanic	No	327	177.1	134.5	7.4	3	870	30	90	150	225	340	489	590	615
Hispanic	Yes	20	144.9	85.1	19.0	5	440	38	110	120	160	222	343	440	440
Hispanic	DK	2	142.5	31.8	22.5	120	165	120	120	143	165	165	165	165	165
Hispanic	Refused	3	261.0	171.9	99.2	73	410	73	73	300	410	410	410	410	410
Employment	-	12	133.8	73.6	21.2	45	270	45	60	135	178	225	270	270	270
Employment	Full Time	223	182.4	138.3	9.3	5	870	30	90	150	228	340	525	600	630
Employment	Part Time	43	201.2	155.5	23.7	5	615	45	90	150	270	455	520	615	615
Employment	Not Employed	70	146.3	97.4	11.6	3	479	30	73	123	180	255	328	462	479
Employment	Refused	4	176.3	115.1	57.6	45	300	45	83	180	270	300	300	300	300
Education	-	13	146.5	84.2	23.3	45	300	45	60	150	185	270	300	300	300
Education	< High School	28	218.0	170.2	32.2	60	870	75	120	175	235	420	568	870	870
Education	High School Graduate	117	177.8	130.1	12.0	3	630	25	90	150	225	360	489	540	570
Education	< College	95	205.3	152.8	15.7	5	650	30	105	180	240	462	590	615	650
Education	College Graduate	55	141.8	92.8	12.5	10	417	20	75	120	205	265	340	410	417
Education	Post Graduate	44	131.4	90.2	13.6	30	400	30	60	110	178	265	290	400	400
Census Region	Northeast	83	179.3	137.0	15.0	5	650	45	89	140	240	328	489	630	650
Census Region	Midwest	88	169.8	126.2	13.5	5	615	30	90	148	212	299	487	568	615
Census Region	South	91	175.7	132.0	13.8	3	870	35	90	148	225	270	462	570	870
Census Region	West	90	178.5	135.5	14.3	5	605	30	85	153	225	407	479	590	605
Day Of Week	Weekday	192	167.5	133.5	9.6	5	650	30	80	120	210	340	520	590	605
Day Of Week	Weekend	160	185.9	130.4	10.3	3	870	45	108	165	228	322	475	568	630
Season	Winter	93	182.7	131.7	13.7	5	650	40	87	150	240	410	455	560	650
Season	Spring	83	186.1	147.6	16.2	5	870	30	90	140	230	380	498	570	870
Season	Summer	99	160.3	130.7	13.1	3	630	30	75	120	189	285	530	605	630
Season	Fall	77	176.4	117.2	13.4	15	615	30	100	165	220	299	410	600	615
Asthma	No	331	176.3	133.7	7.4	3	870	30	90	150	225	340	487	590	615
Asthma	Yes	18	169.4	109.0	25.7	60	530	60	105	135	210	270	530	530	530
Asthma	DK	3	160.0	124.9	72.1	60	300	60	60	120	300	300	300	300	300
Angina	No	345	177.0	132.8	7.1	3	870	30	90	150	225	340	487	590	615
Angina	Yes	5	82.0	47.2	21.1	5	120	5	75	90	120	120	120	120	120
Angina	DK	2	210.0	127.3	90.0	120	300	120	120	210	300	300	300	300	300
Bronchitis/Emphysema	No	333	177.3	133.3	7.3	3	870	30	90	150	225	340	487	590	615
Bronchitis/Emphysema	Yes	17	148.6	108.5	26.3	50	530	50	110	120	175	210	530	530	530
Bronchitis/Emphysema	DK	2	165.0	190.9	135.0	30	300	30	30	165	300	300	300	300	300

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at School

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1,224	343.4	179.1	5.1	1	995	10	210	395	454	540	585	660	723
Sex	Male	581	358.6	167.7	7.0	1	995	30	255	400	450	540	600	690	778
Sex	Female	643	329.6	187.9	7.4	1	855	5	180	390	455	540	582	640	683
Age (years)	-	18	314.1	230.9	54.4	5	713	5	165	248	520	625	713	713	713
Age (years)	1 to 4	43	288.5	217.6	33.2	5	665	10	60	269	500	580	595	665	665
Age (years)	5 to 11	302	396.3	109.2	6.3	5	665	170	365	403	445	535	565	625	640
Age (years)	12 to 17	287	402.6	125.5	7.4	15	855	120	383	420	450	500	565	710	778
Age (years)	18 to 64	550	295.4	207.3	8.8	1	995	5	104	300	460	553	612	683	785
Age (years)	>64	24	187.7	187.0	38.2	2	585	3	45	120	328	480	510	585	585
Race	White	928	348.5	180.5	5.9	1	995	10	213	400	458	545	600	665	723
Race	Black	131	339.8	169.3	14.8	2	855	15	230	390	445	510	580	624	645
Race	Asian	39	332.4	179.9	28.8	5	840	20	190	365	450	560	580	840	840
Race	Some Others	36	363.6	155.6	25.9	10	820	105	273	366	458	502	598	820	820
Race	Hispanic	76	294.0	175.7	20.2	2	565	10	143	363	432	495	525	540	565
Race	Refused	14	279.7	221.3	59.1	5	681	5	60	260	440	625	681	681	681
Hispanic	No	1,082	344.9	179.6	5.5	1	995	10	210	395	455	540	598	665	730
Hispanic	Yes	127	333.0	173.8	15.4	2	820	15	200	390	445	500	565	600	630
Hispanic	DK	5	293.0	244.7	109.4	3	562	3	65	415	420	562	562	562	562
Hispanic	Refused	10	329.5	180.1	56.9	5	625	5	200	350	445	538	625	625	625
Employment	-	616	390.3	130.2	5.2	5	855	115	365	410	450	525	570	640	665
Employment	Full Time	275	331.3	222.0	13.4	1	995	5	115	405	510	575	625	690	755
Employment	Part Time	138	280.9	174.8	14.9	1	800	10	160	285	412	480	537	660	683
Employment	Not Employed	190	258.7	199.5	14.5	1	855	5	60	263	410	528	572	778	840
Employment	Refused	5	166.0	179.1	80.1	5	440	5	5	180	200	440	440	440	440
Education	-	679	388.9	132.8	5.1	5	855	100	360	410	450	525	580	640	710
Education	< High School	24	233.3	179.6	36.7	1	540	2	30	298	374	460	465	540	540
Education	High School Graduate	114	186.6	193.6	18.1	1	785	4	20	108	295	480	580	645	690
Education	< College	173	281.4	209.9	16.0	1	995	5	120	255	425	550	640	820	855
Education	College Graduate	93	300.4	208.7	21.6	1	755	5	115	320	470	540	580	730	755
Education	Post Graduate	141	373.5	193.4	16.3	1	683	15	250	442	510	575	615	655	680
Census Region	Northeast	261	345.7	181.5	11.2	1	995	11	210	385	455	535	620	710	855
Census Region	Midwest	290	334.4	176.7	10.4	1	730	10	180	390	440	530	585	645	683
Census Region	South	427	354.0	178.5	8.6	1	855	10	235	415	462	540	575	640	755
Census Region	West	246	332.8	180.3	11.5	1	820	15	195	378	440	555	595	681	713
Day Of Week	Weekday	1,179	346.8	177.5	5.2	1	995	10	222	395	455	540	585	655	723
Day Of Week	Weekend	45	252.0	198.5	29.6	20	820	40	105	180	360	555	632	820	820
Season	Winter	392	369.3	164.4	8.3	1	855	20	285	405	457	545	600	680	710
Season	Spring	353	355.1	165.5	8.8	1	855	12	250	400	455	535	575	636	713
Season	Summer	207	316.8	196.4	13.6	2	995	10	125	365	445	557	585	640	723
Season	Fall	272	311.0	195.3	11.8	1	855	5	120	365	445	540	595	660	778
Asthma	No	1,095	342.8	179.2	5.4	1	995	10	200	390	455	540	585	660	723
Asthma	Yes	124	350.7	178.8	16.1	1	855	10	250	402	445	535	605	645	800
Asthma	DK	5	287.0	190.7	85.3	5	445	5	180	365	440	445	445	445	445
Angina	No	1,209	344.6	178.9	5.1	1	995	10	210	395	455	540	595	660	723
Angina	Yes	9	205.8	169.5	56.5	15	510	15	90	180	275	510	510	510	510
Angina	DK	6	292.2	178.9	73.0	5	480	5	180	324	440	480	480	480	480
Bronchitis/Emphysema	No	1,175	344.8	178.8	5.2	1	995	10	212	395	455	540	595	660	730
Bronchitis/Emphysema	Yes	42	306.7	188.2	29.0	3	632	10	120	378	444	465	580	632	632
Bronchitis/Emphysema	DK	7	315.4	163.7	61.9	5	440	5	180	378	440	440	440	440	440

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Office or Factory

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1,975	394.0	230.8	5.2	1	1,440	9	180	485	550	630	675	765	818
Sex	Male	1,012	410.8	233.5	7.3	1	1,440	10	225	495	565	645	710	780	855
Sex	Female	963	376.3	226.7	7.3	1	855	5	120	480	540	600	645	710	750
Age (years)	-	49	438.9	232.6	33.2	10	900	20	299	500	555	675	780	900	900
Age (years)	1 to 4	12	31.6	25.6	7.4	5	90	5	13	25	45	60	90	90	90
Age (years)	5 to 11	14	100.9	155.1	41.5	2	580	2	10	33	178	195	580	580	580
Age (years)	12 to 17	19	145.4	181.1	41.6	1	625	1	10	50	240	510	625	625	625
Age (years)	18 to 64	1,749	419.0	218.4	5.2	1	1,440	10	273	500	555	630	680	765	818
Age (years)	>64	132	145.8	194.0	16.9	1	705	3	10	40	205	495	540	640	675
Race	White	1,612	387.6	232.0	5.8	1	1,440	6	150	480	550	628	675	750	800
Race	Black	191	413.9	218.0	15.8	1	1,037	10	268	485	540	635	720	803	900
Race	Asian	42	428.0	216.8	33.4	10	780	30	285	492	553	660	745	780	780
Race	Some Others	28	480.9	200.9	38.0	40	795	75	348	540	583	715	780	795	795
Race	Hispanic	74	394.5	237.8	27.6	1	840	5	230	493	560	645	720	765	840
Race	Refused	28	482.9	246.1	46.5	30	997	30	373	533	608	818	860	997	997
Hispanic	No	1,805	393.5	229.6	5.4	1	1,440	10	180	483	550	630	675	755	810
Hispanic	Yes	138	393.6	238.6	20.3	1	840	5	180	498	560	644	675	765	795
Hispanic	DK	7	262.6	242.1	91.5	1	610	1	12	245	540	610	610	610	610
Hispanic	Refused	25	470.0	258.8	51.8	17	860	30	311	525	615	810	818	860	860
Employment	-	43	121.3	178.0	27.1	1	685	2	10	40	178	307	580	685	685
Employment	Full Time	1,535	455.6	200.3	5.1	1	1,440	15	400	510	570	644	700	775	837
Employment	Part Time	164	293.0	197.0	15.4	1	750	10	95	343	480	525	555	585	615
Employment	Not Employed	213	77.6	123.0	8.4	1	705	3	10	30	90	215	305	570	640
Employment	Refused	20	449.2	184.8	41.3	30	675	60	334	523	550	645	675	675	675
Education	-	80	225.1	248.5	27.8	1	860	3	15	105	470	608	675	780	860
Education	< High School	104	329.5	264.4	25.9	2	930	5	51	389	553	640	705	765	855
Education	High School Graduate	631	396.9	228.1	9.1	1	997	10	210	492	550	615	675	760	800
Education	< College	462	393.1	228.8	10.6	1	1,440	5	210	480	540	615	660	770	820
Education	College Graduate	415	437.2	205.2	10.1	1	900	10	325	510	570	640	690	750	800
Education	Post Graduate	283	396.9	232.2	13.8	2	860	5	175	480	565	640	675	780	818
Census Region	Northeast	465	399.1	226.2	10.5	1	930	10	215	485	550	625	675	765	840
Census Region	Midwest	439	389.3	229.1	10.9	1	997	8	180	480	550	630	670	750	800
Census Region	South	666	408.6	228.2	8.8	1	1,440	10	225	498	555	630	675	760	840
Census Region	West	405	369.1	240.4	11.9	1	900	5	95	470	550	630	675	760	800
Day Of Week	Weekday	1,759	406.8	225.2	5.4	1	997	10	237	495	555	630	675	755	810
Day Of Week	Weekend	216	289.6	249.1	16.9	1	1,440	3	30	283	495	600	670	800	900
Season	Winter	531	390.7	231.7	10.1	1	997	10	180	480	550	625	675	755	835
Season	Spring	470	385.2	240.7	11.1	1	1,440	5	120	480	553	630	695	775	837
Season	Summer	550	393.5	224.5	9.6	1	1,037	9	200	483	540	614	675	753	810
Season	Fall	424	408.4	226.6	11.0	1	840	10	239	500	567	640	675	750	770
Asthma	No	1,845	395.0	230.4	5.4	1	1,440	8	185	490	550	630	675	760	810
Asthma	Yes	114	371.7	231.3	21.7	3	840	10	120	463	540	630	675	800	837
Asthma	DK	16	437.0	272.1	68.0	5	860	5	233	520	588	780	860	860	860
Angina	No	1,931	395.7	229.7	5.2	1	1,440	10	195	490	550	630	675	760	811
Angina	Yes	26	265.5	246.8	48.4	5	650	9	15	175	490	630	645	650	650
Angina	DK	18	392.3	282.6	66.6	5	860	5	30	490	550	780	860	860	860
Bronchitis/Emphysema	No	1,873	395.6	230.0	5.3	1	1,440	8	195	490	550	630	675	760	818
Bronchitis/Emphysema	Yes	86	356.4	236.1	25.5	5	800	10	75	428	540	620	660	720	800
Bronchitis/Emphysema	DK	16	403.9	289.5	72.4	5	860	5	30	490	583	780	860	860	860

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Schools, Churches, Hospitals, and Public Buildings

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		2,932	274.3	205.9	3.8	1	1,440	20	95	221	430	540	615	725	805
Sex	Male	1,234	285.1	206.7	5.9	1	1,440	30	110	255	425	540	620	745	840
Sex	Female	1,698	266.5	205.1	5.0	1	1,440	20	90	200	430	540	610	713	800
Age (years)	-	50	269.0	221.0	31.3	5	1,030	30	100	193	400	590	625	872	1,030
Age (years)	1 to 4	98	233.0	235.8	23.8	1	1,440	5	60	150	390	545	595	900	1,440
Age (years)	5 to 11	391	351.2	149.6	7.6	5	665	70	245	389	440	535	562	625	645
Age (years)	12 to 17	355	366.3	161.2	8.6	1	935	60	260	415	446	502	605	710	805
Age (years)	18 to 64	1,653	267.7	221.2	5.4	1	1,440	15	87	190	450	570	655	760	855
Age (years)	>64	385	151.1	128.6	6.6	5	710	21	60	115	195	340	435	525	615
Race	White	2,310	268.2	204.3	4.3	1	1,440	20	90	210	429	540	612	705	765
Race	Black	332	303.5	207.1	11.4	1	1,440	35	135	285	440	540	630	775	1,000
Race	Asian	61	295.0	199.4	25.5	5	900	30	135	240	425	535	565	840	900
Race	Some Others	57	314.7	203.5	27.0	10	967	30	135	360	455	525	598	820	967
Race	Hispanic	141	283.9	229.8	19.4	2	1,440	11	100	237	430	525	630	840	940
Race	Refused	31	257.8	192.5	34.6	5	681	5	120	240	430	495	625	681	681
Hispanic	No	2,654	271.3	203.6	4.0	1	1,440	20	94	215	425	540	612	712	800
Hispanic	Yes	240	306.4	230.8	14.9	1	1,440	20	110	288	445	568	695	840	940
Hispanic	DK	13	279.4	230.7	64.0	35	760	35	65	235	420	562	760	760	760
Hispanic	Refused	25	286.6	175.4	35.1	5	625	55	145	255	440	495	565	625	625
Employment	-	821	343.5	171.1	6.0	1	1,440	55	190	393	441	520	570	645	713
Employment	Full Time	1,029	300.3	239.8	7.5	1	1,440	15	90	215	510	610	685	775	900
Employment	Part Time	293	251.3	199.3	11.6	1	1,030	20	85	200	387	525	610	800	880
Employment	Not Employed	775	176.4	148.4	5.3	1	855	15	60	121	250	400	475	570	641
Employment	Refused	14	212.9	147.7	39.5	5	440	5	120	190	305	430	440	440	440
Education	-	917	340.3	172.6	5.7	1	1,440	45	190	390	440	525	580	645	713
Education	< High School	166	172.6	138.0	10.7	1	735	27	70	124	235	375	465	525	640
Education	High School Graduate	617	207.3	199.0	8.0	1	1,440	15	60	135	295	510	585	690	785
Education	< College	520	247.5	213.6	9.4	1	1,000	15	85	165	420	553	640	760	855
Education	College Graduate	351	261.6	214.3	11.4	1	1,005	15	85	180	450	560	625	750	800
Education	Post Graduate	361	319.1	236.2	12.4	1	1,440	30	110	290	510	615	683	765	900
Census Region	Northeast	645	272.7	211.6	8.3	1	1,440	25	90	215	420	545	630	735	855
Census Region	Midwest	686	275.4	207.2	7.9	1	1,440	30	88	239	425	540	615	745	850
Census Region	South	1,036	278.4	201.0	6.2	1	1,440	20	110	230	440	535	600	690	778
Census Region	West	565	267.4	207.2	8.7	1	1,440	15	100	200	420	555	620	712	820
Day Of Week	Weekday	2,091	309.8	212.6	4.6	1	1,440	15	115	340	460	565	632	750	855
Day Of Week	Weekend	841	186.0	156.9	5.4	1	1,440	40	85	140	230	385	525	640	735
Season	Winter	847	296.6	201.2	6.9	1	1,440	30	120	285	444	545	615	710	770
Season	Spring	805	276.8	204.6	7.2	1	1,440	30	110	220	420	535	600	725	840
Season	Summer	667	254.1	209.7	8.1	1	1,015	20	80	180	420	550	630	738	890
Season	Fall	613	262.4	207.3	8.4	1	1,005	14	75	210	425	540	615	712	778
Asthma	No	2,689	273.2	207.3	4.0	1	1,440	20	94	217	430	540	615	725	820
Asthma	Yes	229	288.0	191.6	12.7	1	855	25	120	275	435	533	605	645	800
Asthma	DK	14	270.0	171.2	45.8	5	565	5	145	280	430	445	565	565	565
Angina	No	2,836	277.1	206.4	3.9	1	1,440	20	100	230	430	540	615	725	805
Angina	Yes	78	176.4	172.8	19.6	5	890	28	60	120	195	480	575	625	890
Angina	DK	18	258.3	165.6	39.0	3	565	3	145	270	378	480	565	565	565
Bronchitis/Emphysema	No	2,794	277.0	207.3	3.9	1	1,440	20	95	228	430	540	615	726	840
Bronchitis/Emphysema	Yes	121	212.6	166.3	15.1	10	662	30	90	145	375	445	490	605	630
Bronchitis/Emphysema	DK	17	275.8	163.4	39.6	5	565	5	145	305	415	440	565	565	565

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Malls, Grocery Stores, or Other Stores

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		2,697	115.0	141.0	2.7	1	1,080	10	30	60	135	285	482	570	640
Sex	Male	1,020	120.2	157.1	4.9	1	840	5	30	60	130	375	530	609	658
Sex	Female	1,677	111.8	130.1	3.2	1	1,080	10	30	60	135	255	400	550	600
Age (years)	-	50	139.4	137.6	19.5	15	660	20	45	93	180	339	420	565	660
Age (years)	1 to 4	110	90.0	77.9	7.4	5	420	10	40	65	105	210	250	359	360
Age (years)	5 to 11	129	77.7	68.0	6.0	3	320	5	30	60	110	180	225	255	280
Age (years)	12 to 17	140	88.7	101.4	8.6	1	530	5	20	45	124	223	318	384	413
Age (years)	18 to 64	1,871	125.9	156.8	3.6	1	1,080	10	30	60	150	360	525	600	658
Age (years)	>64	397	88.6	88.5	4.4	1	655	10	30	60	120	180	255	400	470
Race	White	2,234	111.6	139.4	3.0	1	1,080	10	30	60	130	265	495	570	640
Race	Black	237	123.0	152.3	9.9	2	800	10	25	60	135	370	480	600	613
Race	Asian	37	158.9	151.7	24.9	2	600	14	50	105	220	410	480	600	600
Race	Some Others	52	150.2	146.7	20.3	5	660	14	65	103	180	280	588	600	660
Race	Hispanic	110	133.1	138.3	13.2	1	720	10	35	90	195	310	450	535	540
Race	Refused	27	124.7	131.1	25.2	10	515	10	30	60	207	300	380	515	515
Hispanic	No	2,476	114.4	141.8	2.9	1	1,080	10	30	60	132	285	495	570	640
Hispanic	Yes	188	126.1	133.2	9.7	1	720	10	30	90	173	270	450	540	610
Hispanic	DK	12	49.4	37.7	10.9	2	122	2	18	48	70	105	122	122	122
Hispanic	Refused	21	122.4	138.5	30.2	10	515	20	33	60	180	290	380	515	515
Employment	-	372	86.9	86.3	4.5	1	660	5	30	60	120	206	255	360	384
Employment	Full Time	1,170	136.8	176.7	5.2	1	1,080	10	30	60	150	480	562	640	690
Employment	Part Time	285	134.1	147.7	8.8	2	540	6	30	65	186	400	480	520	540
Employment	Not Employed	854	91.2	87.2	3.0	1	585	10	30	60	120	195	255	360	420
Employment	Refused	16	98.9	110.0	27.5	10	357	10	32	53	115	290	357	357	357
Education	-	420	88.3	91.9	4.5	1	660	5	29	60	120	210	263	384	420
Education	< High School	206	128.9	155.7	10.8	2	1,080	10	30	75	150	330	500	570	605
Education	High School Graduate	792	126.3	158.9	5.6	1	960	5	30	60	150	365	524	600	660
Education	< College	583	129.8	149.5	6.2	1	800	10	30	70	165	345	510	563	651
Education	College Graduate	411	117.9	144.1	7.1	1	720	10	30	60	135	290	515	600	640
Education	Post Graduate	285	78.2	95.7	5.7	1	630	10	25	50	90	160	250	450	555
Census Region	Northeast	622	110.2	134.9	5.4	1	755	5	30	60	130	280	465	563	600
Census Region	Midwest	601	108.2	133.1	5.4	2	840	10	30	60	130	250	440	560	645
Census Region	South	871	127.9	155.8	5.3	1	1,080	10	30	60	155	320	520	600	660
Census Region	West	603	107.9	130.7	5.3	1	840	10	30	60	120	255	430	550	600
Day Of Week	Weekday	1,721	117.5	148.9	3.6	1	1,080	10	30	60	135	320	510	586	650
Day Of Week	Weekend	976	110.6	125.7	4.0	1	840	5	30	65	135	255	380	560	608
Season	Winter	683	111.7	134.0	5.1	2	840	10	30	60	135	255	420	568	660
Season	Spring	679	115.8	142.2	5.5	1	720	10	30	60	130	300	500	588	645
Season	Summer	759	113.1	147.5	5.4	1	1,080	5	30	60	125	300	510	570	610
Season	Fall	576	120.2	138.9	5.8	1	840	10	30	60	160	295	480	550	640
Asthma	No	2,480	116.2	142.4	2.9	1	1,080	10	30	60	135	288	495	575	640
Asthma	Yes	208	101.1	125.0	8.7	1	600	5	30	60	120	245	420	545	550
Asthma	DK	9	85.1	79.6	26.5	33	290	33	55	58	60	290	290	290	290
Angina	No	2,607	116.0	142.1	2.8	1	1,080	10	30	60	135	290	495	570	640
Angina	Yes	74	90.8	103.9	12.1	2	630	15	37	64	105	150	190	510	630
Angina	DK	16	62.7	68.1	17.0	2	290	2	30	55	60	110	290	290	290
Bronchitis/Emphysema	No	2,553	115.7	141.7	2.8	1	1,080	10	30	60	135	285	481	570	640
Bronchitis/Emphysema	Yes	130	104.8	131.3	11.5	5	613	10	25	60	135	193	505	575	609
Bronchitis/Emphysema	DK	14	71.1	66.9	17.9	20	290	20	35	57	70	110	290	290	290

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at a Gym/Health Club

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		364	129.7	104.3	5.5	5	686	30	60	110	155	240	320	525	600
Sex	Male	176	147.2	115.6	8.7	5	686	30	78	120	175	285	360	533	660
Sex	Female	188	113.2	89.9	6.6	5	660	30	60	93	135	200	279	420	560
Age (years)	-	6	202.5	227.9	93.0	30	560	30	55	75	420	560	560	560	560
Age (years)	1 to 4	5	156.0	29.9	13.4	105	180	105	160	160	175	180	180	180	180
Age (years)	5 to 11	28	105.3	69.5	13.1	5	325	30	58	83	141	165	270	325	325
Age (years)	12 to 17	39	165.4	122.1	19.5	15	660	30	90	138	206	330	440	660	660
Age (years)	18 to 64	254	123.1	98.8	6.2	5	686	30	60	100	150	210	295	475	600
Age (years)	>64	32	141.4	114.2	20.2	10	533	30	60	103	173	292	340	533	533
Race	White	307	134.3	109.4	6.2	5	686	30	65	110	164	255	330	533	600
Race	Black	30	117.7	75.4	13.8	5	320	10	60	115	145	235	285	320	320
Race	Asian	10	75.2	36.5	11.5	30	145	30	54	60	95	133	145	145	145
Race	Some Others	11	112.9	69.1	20.8	25	270	25	65	90	153	179	270	270	270
Race	Hispanic	4	83.8	42.7	21.3	40	140	40	53	78	115	140	140	140	140
Race	Refused	2	57.5	3.5	2.5	55	60	55	55	58	60	60	60	60	60
Hispanic	No	345	132.0	105.9	5.7	5	686	30	65	110	160	240	325	533	600
Hispanic	Yes	17	90.1	58.8	14.3	5	255	5	60	90	115	140	255	255	255
Hispanic	Refused	2	57.5	3.5	2.5	55	60	55	55	58	60	60	60	60	60
Employment	-	72	139.6	103.3	12.2	5	660	30	76	120	165	265	330	440	660
Employment	Full Time	176	131.2	112.5	8.5	5	686	30	60	110	150	240	330	560	660
Employment	Part Time	40	129.3	92.8	14.7	25	420	35	60	95	168	285	325	420	420
Employment	Not Employed	75	117.9	91.3	10.5	5	533	25	60	90	145	230	285	475	533
Employment	Refused	1	40.0	-	-	40	40	40	40	40	40	40	40	40	40
Education	-	81	136.9	99.7	11.1	5	660	30	75	120	164	215	325	440	660
Education	< High School	9	110.6	97.7	32.6	10	300	10	30	80	165	300	300	300	300
Education	High School Graduate	61	128.5	110.0	14.1	5	660	25	75	105	145	210	310	525	660
Education	< College	71	145.6	129.1	15.3	5	600	35	65	110	170	285	533	560	600
Education	College Graduate	81	122.0	99.5	11.1	15	686	30	60	98	135	220	285	420	686
Education	Post Graduate	61	115.6	76.9	9.8	10	415	40	60	90	145	225	265	320	415
Census Region	Northeast	83	140.5	107.2	11.8	20	660	40	70	120	170	240	330	600	660
Census Region	Midwest	62	127.0	88.7	11.3	5	440	25	60	113	170	285	300	340	440
Census Region	South	118	125.7	107.0	9.9	5	660	15	60	105	150	240	330	533	540
Census Region	West	101	127.0	108.5	10.8	5	686	50	60	92	135	225	292	525	560
Day Of Week	Weekday	281	121.3	96.6	5.8	5	686	30	60	98	145	210	295	475	560
Day Of Week	Weekend	83	158.1	123.7	13.6	5	660	30	77	120	180	285	415	600	660
Season	Winter	127	139.8	108.3	9.6	5	686	25	75	120	177	240	330	533	660
Season	Spring	85	141.5	115.2	12.5	10	600	30	65	102	164	285	340	560	600
Season	Summer	81	109.9	87.4	9.7	5	525	30	60	90	130	160	310	440	525
Season	Fall	71	119.9	99.0	11.7	20	660	30	56	98	150	215	295	420	660
Asthma	No	333	132.4	106.8	5.9	5	686	30	62	110	160	255	325	533	600
Asthma	Yes	28	100.1	69.4	13.1	5	330	25	60	86	118	210	230	330	330
Asthma	DK	3	101.7	55.8	32.2	60	165	60	60	80	165	165	165	165	165
Angina	No	357	130.5	105.0	5.6	5	686	30	62	110	155	240	325	525	600
Angina	Yes	4	90.0	47.6	23.8	60	160	60	60	70	120	160	160	160	160
Angina	DK	3	81.7	65.3	37.7	30	155	30	30	60	155	155	155	155	155
Bronchitis/Emphysema	No	352	130.7	104.8	5.6	5	686	30	61	110	158	240	320	525	600
Bronchitis/Emphysema	Yes	10	97.3	92.8	29.4	10	330	10	45	77	120	245	330	330	330
Bronchitis/Emphysema	DK	2	107.5	67.2	47.5	60	155	60	60	108	155	155	155	155	155

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at an Auto Repair Shop/Gas Station

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		153	190.7	234.5	19.0	1	930	5	15	60	360	565	645	695	748
Gender	Male	105	241.5	250.3	24.4	2	930	5	15	115	495	600	675	700	748
Gender	Female	48	79.6	144.5	20.9	1	595	3	10	15	70	295	485	595	595
Age (years)	-	3	161.7	115.6	66.7	90	295	90	90	100	295	295	295	295	295
Age (years)	1 to 4	4	40.0	50.2	25.1	10	115	10	13	18	68	115	115	115	115
Age (years)	5 to 11	5	22.0	21.7	9.7	5	60	5	15	15	15	60	60	60	60
Age (years)	12 to 17	7	153.9	205.1	77.5	3	505	3	5	55	390	505	505	505	505
Age (years)	18 to 64	118	223.8	249.3	23.0	1	930	5	15	75	480	600	675	700	748
Age (years)	> 64	16	58.1	96.9	24.2	2	358	2	15	20	43	225	358	358	358
Race	White	130	195.5	237.5	20.8	1	930	5	15	60	390	588	645	700	748
Race	Black	12	149.7	203.3	58.7	2	565	2	7	75	229	495	565	565	565
Race	Asian	5	173.0	231.2	103.4	5	525	5	15	25	295	525	525	525	525
Race	Some Others	3	15.0	10.0	5.8	5	25	5	5	15	25	25	25	25	25
Race	Hispanic	3	350.0	330.1	190.6	15	675	15	15	360	675	675	675	675	675
Hispanic	No	148	188.9	233.7	19.2	1	930	5	15	60	370	565	630	700	748
Hispanic	Yes	5	243.0	279.7	125.1	15	675	15	15	150	360	675	675	675	675
Employment	-	16	84.2	146.7	36.7	3	505	3	13	18	70	390	505	505	505
Employment	Full Time	84	283.6	263.8	28.8	3	930	5	18	230	540	630	680	748	930
Employment	Part Time	16	104.2	147.4	36.8	5	390	5	13	18	188	359	390	390	390
Employment	Not Employed	35	65.9	94.7	16.0	1	432	2	15	30	90	160	358	432	432
Employment	Refused	2	17.5	17.7	12.5	5	30	5	5	18	30	30	30	30	30
Education	-	18	95.1	153.9	36.2	3	505	3	10	18	79	390	505	505	505
Education	< High School	16	327.2	301.2	75.3	5	930	5	60	278	615	675	930	930	930
Education	High School Graduate	51	233.4	243.1	34.0	2	748	5	20	120	480	565	675	695	748
Education	< College	32	253.5	252.8	44.7	2	700	5	15	157	518	595	680	700	700
Education	College Graduate	19	72.9	126.3	29.0	1	508	1	5	20	90	295	508	508	508
Education	Post Graduate	17	49.0	73.4	17.8	5	235	5	10	15	35	225	235	235	235
Census Region	Northeast	29	247.3	257.1	47.7	2	930	3	30	120	432	600	748	930	930
Census Region	Midwest	48	230.9	251.6	36.3	1	700	5	18	75	510	600	680	700	700
Census Region	South	43	165.7	211.6	32.3	3	675	5	15	50	358	555	595	675	675
Census Region	West	33	115.0	198.9	34.6	5	675	5	10	15	100	505	645	675	675
Day Of Week	Weekday	121	204.6	244.9	22.3	1	930	5	15	60	390	595	675	700	748
Day Of Week	Weekend	32	137.9	184.2	32.6	2	540	3	15	40	200	505	510	540	540
Season	Winter	28	177.1	258.1	48.8	2	930	5	15	30	355	595	700	930	930
Season	Spring	44	189.6	223.3	33.7	2	645	5	15	80	385	565	600	645	645
Season	Summer	52	171.7	223.8	31.0	1	680	3	10	30	348	540	675	675	680
Season	Fall	29	239.4	251.4	46.7	5	748	8	35	95	445	605	695	748	748
Asthma	No	145	191.3	235.3	19.5	1	930	5	15	60	360	565	645	700	748
Asthma	Yes	8	179.9	234.8	83.0	5	600	5	5	38	375	600	600	600	600
Angina	No	149	191.0	235.3	19.3	1	930	5	15	60	360	585	645	700	748
Angina	Yes	4	177.5	235.7	117.9	5	510	5	10	98	345	510	510	510	510
Bronchitis/Emphysema	No	146	189.0	235.0	19.4	1	930	5	15	58	360	585	645	700	748
Bronchitis/Emphysema	Yes	7	225.0	240.0	90.7	5	555	5	5	95	510	555	555	555	555

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at the Laundromat

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		40	99.3	85.2	13.5	2	500	5	55	91	120	153	238	500	500
Gender	Male	9	150.2	146.8	48.9	2	500	2	115	120	150	500	500	500	500
Gender	Female	31	84.5	51.8	9.3	5	265	5	50	80	115	137	155	265	265
Age (years)	5 to 11	3	80.7	17.9	10.3	60	92	60	60	90	92	92	92	92	92
Age (years)	18 to 64	33	101.2	91.7	16.0	2	500	5	50	90	120	155	265	500	500
Age (years)	> 64	4	97.5	63.6	31.8	5	150	5	60	118	135	150	150	150	150
Race	White	31	102.2	93.8	16.9	2	500	5	50	90	120	155	265	500	500
Race	Black	6	75.7	50.3	20.5	5	130	5	34	85	115	130	130	130	130
Race	Hispanic	3	116.7	30.6	17.6	90	150	90	90	110	150	150	150	150	150
Hispanic	No	37	97.9	88.2	14.5	2	500	5	50	90	120	155	265	500	500
Hispanic	Yes	3	116.7	30.6	17.6	90	150	90	90	110	150	150	150	150	150
Employment	-	3	80.7	17.9	10.3	60	92	60	60	90	92	92	92	92	92
Employment	Full Time	20	97.6	104.7	23.4	2	500	4	42	84	115	143	328	500	500
Employment	Part Time	4	127.5	91.9	45.9	75	265	75	78	85	178	265	265	265	265
Employment	Not Employed	13	97.4	60.9	16.9	5	210	5	45	115	137	150	210	210	210
Education	-	3	80.7	17.9	10.3	60	92	60	60	90	92	92	92	92	92
Education	< High School	6	95.0	53.3	21.8	5	150	5	60	113	130	150	150	150	150
Education	High School Graduate	17	101.4	64.4	15.6	5	265	5	59	90	120	210	265	265	265
Education	< College	6	91.5	56.4	23.0	10	155	10	34	115	120	155	155	155	155
Education	College Graduate	7	126.4	168.2	63.6	5	500	5	45	70	110	500	500	500	500
Education	Post Graduate	1	2.0	-	-	2	2	2	2	2	2	2	2	2	2
Census Region	Northeast	6	168.7	166.5	68.0	45	500	45	75	126	140	500	500	500	500
Census Region	Midwest	8	94.0	60.3	21.3	5	210	5	58	94	118	210	210	210	210
Census Region	South	18	85.9	61.8	14.6	2	265	2	50	76	115	155	265	265	265
Census Region	West	8	82.5	52.9	18.7	5	150	5	35	100	118	150	150	150	150
Day Of Week	Weekday	25	103.3	100.7	20.1	2	500	5	50	90	115	155	265	500	500
Day Of Week	Weekend	15	92.5	52.7	13.6	10	210	10	60	92	130	150	210	210	210
Season	Winter	11	86.5	58.0	17.5	2	210	2	45	80	120	140	210	210	210
Season	Spring	12	85.6	71.7	20.7	5	265	5	35	74	120	130	265	265	265
Season	Summer	12	118.7	125.8	36.3	5	500	5	55	101	113	137	500	500	500
Season	Fall	5	113.8	48.4	21.7	34	155	34	115	115	150	155	155	155	155
Asthma	No	37	95.5	83.9	13.8	2	500	5	50	90	120	150	210	500	500
Asthma	Yes	3	146.3	106.5	61.5	59	265	59	59	115	265	265	265	265	265
Angina	No	40	99.3	85.2	13.5	2	500	5	55	91	120	153	238	500	500
Bronchitis/Emphysema	No	35	92.3	84.3	14.3	2	500	5	50	90	115	130	210	500	500
Bronchitis/Emphysema	Yes	5	148.0	83.3	37.2	30	265	30	140	150	155	265	265	265	265

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at Work (Non-Specific)

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		137	393.9	242.6	20.7	5	979	15	180	440	555	662	810	940	960
Gender	Male	96	435.3	244.0	24.9	10	979	20	245	473	598	765	840	960	979
Gender	Female	41	297.2	212.4	33.2	5	780	15	90	280	495	550	590	780	780
Age (years)	-	4	568.8	394.7	197.4	90	940	90	248	623	890	940	940	940	940
Age (years)	1 to 4	2	200.0	70.7	50.0	150	250	150	150	200	250	250	250	250	250
Age (years)	5 to 11	4	33.8	11.1	5.5	20	45	20	25	35	43	45	45	45	45
Age (years)	12 to 17	2	207.5	166.2	117.5	90	325	90	90	208	325	325	325	325	325
Age (years)	18 to 64	121	409.7	230.9	21.0	5	979	15	240	450	560	660	793	850	960
Age (years)	> 64	4	293.8	289.5	144.7	10	610	10	50	278	538	610	610	610	610
Race	White	113	397.9	235.2	22.1	5	979	15	210	450	555	660	780	940	960
Race	Black	13	379.2	286.5	79.5	10	850	10	85	405	510	810	850	850	850
Race	Some Others	1	405.0	-	-	405	405	405	405	405	405	405	405	405	405
Race	Hispanic	9	314.8	266.2	88.7	30	793	30	95	245	440	793	793	793	793
Race	Refused	1	840.0	-	-	840	840	840	840	840	840	840	840	840	840
Hispanic	No	121	388.7	242.1	22.0	5	979	15	180	405	550	660	795	940	960
Hispanic	Yes	12	361.1	242.1	69.9	30	793	30	138	370	510	660	793	793	793
Hispanic	DK	2	585.0	35.4	25.0	560	610	560	560	585	610	610	610	610	610
Hispanic	Refused	2	717.5	173.2	122.5	595	840	595	595	718	840	840	840	840	840
Employment	-	8	118.8	113.9	40.3	20	325	20	35	68	200	325	325	325	325
Employment	Full Time	97	440.7	237.6	24.1	10	979	15	300	480	585	690	815	960	979
Employment	Part Time	21	341.2	188.2	41.1	30	795	115	240	330	435	590	610	795	795
Employment	Not Employed	9	250.6	218.6	72.9	5	630	5	95	150	360	630	630	630	630
Employment	Refused	2	425.0	586.9	415.0	10	840	10	10	425	840	840	840	840	840
Education	-	11	234.1	266.3	80.3	20	840	20	40	150	325	610	840	840	840
Education	< High School	12	460.4	181.7	52.5	115	795	115	330	495	558	615	795	795	795
Education	High School Graduate	50	409.6	273.7	38.7	5	979	15	150	463	619	735	940	970	979
Education	< College	29	368.9	237.6	44.1	10	850	10	160	405	510	660	765	850	850
Education	College Graduate	22	405.7	184.2	39.3	90	815	150	240	375	540	595	645	815	815
Education	Post Graduate	13	443.7	218.1	60.5	10	793	10	360	500	585	630	793	793	793
Census Region	Northeast	22	405.5	193.8	41.3	15	765	90	320	398	540	660	662	765	765
Census Region	Midwest	26	418.6	250.9	49.2	10	940	13	180	473	610	690	780	940	940
Census Region	South	58	379.7	233.2	30.6	5	979	10	150	420	540	619	810	815	979
Census Region	West	31	391.7	289.5	52.0	10	960	20	90	405	630	795	850	960	960
Day Of Week	Weekday	121	401.8	242.5	22.0	5	979	15	210	450	560	660	810	940	960
Day Of Week	Weekend	16	334.3	243.3	60.8	13	795	13	98	340	495	690	795	795	795
Season	Winter	42	390.8	241.5	37.3	10	960	30	175	405	550	660	765	960	960
Season	Spring	34	361.3	237.0	40.6	10	840	30	150	360	525	660	815	840	840
Season	Summer	41	400.9	262.9	41.1	5	979	13	210	450	570	690	810	979	979
Season	Fall	20	441.8	219.4	49.1	10	793	13	285	490	620	661	728	793	793
Asthma	No	124	393.2	237.3	21.3	5	960	20	180	440	553	660	795	850	940
Asthma	Yes	13	400.9	300.2	83.2	10	979	10	240	320	590	793	979	979	979
Angina	No	133	397.7	243.3	21.1	5	979	15	190	440	555	662	810	940	960
Angina	Yes	3	266.7	255.8	147.7	90	560	90	90	150	560	560	560	560	560
Angina	DK	1	280.0	-	-	280	280	280	280	280	280	280	280	280	280
Bronchitis/Emphysema	No	131	397.1	242.0	21.1	5	979	20	180	440	555	662	810	940	960
Bronchitis/Emphysema	Yes	5	333.4	299.4	133.9	10	619	10	13	460	565	619	619	619	619
Bronchitis/Emphysema	DK	1	280.0	-	-	280	280	280	280	280	280	280	280	280	280

Table 16-18. Time Spent (minutes/day) at Selected Indoor Locations, Doers Only (continued)

Indoors at Dry Cleaners

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		34	82.0	151.7	26.0	2	515	5	5	10	90	325	500	515	515
Gender	Male	11	105.5	166.0	50.1	2	515	2	5	10	103	325	515	515	515
Gender	Female	23	70.8	146.8	30.6	5	500	5	5	10	35	300	485	500	500
Age (years)	-	1	485.0	-	-	485	485	485	485	485	485	485	485	485	485
Age (years)	1 to 4	2	20.0	21.2	15.0	5	35	5	5	20	35	35	35	35	35
Age (years)	18 to 64	28	61.0	120.9	22.9	2	515	5	5	10	55	300	325	515	515
Age (years)	> 64	3	185.0	273.4	157.8	10	500	10	10	45	500	500	500	500	500
Race	White	25	70.7	143.7	28.7	2	515	5	5	10	35	300	485	515	515
Race	Black	7	131.4	199.0	75.2	5	500	5	10	20	325	500	500	500	500
Race	Some Others	1	10.0	-	-	10	10	10	10	10	10	10	10	10	10
Race	Hispanic	1	91.0	-	-	91	91	91	91	91	91	91	91	91	91
Hispanic	No	31	83.8	158.5	28.5	2	515	5	5	10	45	325	500	515	515
Hispanic	Yes	3	63.7	46.5	26.8	10	91	10	10	90	91	91	91	91	91
Employment	-	2	20.0	21.2	15.0	5	35	5	5	20	35	35	35	35	35
Employment	Full Time	25	83.1	151.8	30.4	2	515	5	5	10	90	325	485	515	515
Employment	Part Time	1	500.0	-	-	500	500	500	500	500	500	500	500	500	500
Employment	Not Employed	6	28.5	33.9	13.9	5	91	5	10	10	45	91	91	91	91
Education	-	2	20.0	21.2	15.0	5	35	5	5	20	35	35	35	35	35
Education	< High School	4	234.0	209.2	104.6	45	500	45	68	196	400	500	500	500	500
Education	High School Graduate	8	84.1	165.0	58.3	5	485	5	13	18	62	485	485	485	485
Education	< College	6	146.3	220.3	90.0	5	515	5	10	12	325	515	515	515	515
Education	College Graduate	12	13.5	24.2	7.0	2	90	2	5	5	10	10	90	90	90
Education	Post Graduate	2	50.0	63.6	45.0	5	95	5	5	50	95	95	95	95	95
Census Region	Northeast	8	110.0	187.3	66.2	5	485	5	5	10	180	485	485	485	485
Census Region	Midwest	10	19.1	30.1	9.5	5	103	5	5	8	20	62	103	103	103
Census Region	South	8	197.0	212.0	74.9	15	515	15	30	93	400	515	515	515	515
Census Region	West	8	17.8	29.4	10.4	2	90	2	5	10	10	90	90	90	90
Day Of Week	Weekday	23	94.0	172.8	36.0	2	515	5	5	10	90	485	500	515	515
Day Of Week	Weekend	11	57.1	96.0	28.9	5	325	5	5	10	95	103	325	325	325
Season	Winter	12	74.6	158.1	45.6	5	485	5	5	10	13	325	485	485	485
Season	Spring	4	44.5	41.7	20.8	10	103	10	15	33	74	103	103	103	103
Season	Summer	8	20.3	32.0	11.3	2	95	2	5	5	23	95	95	95	95
Season	Fall	10	155.4	205.7	65.1	5	515	5	13	55	300	508	515	515	515
Asthma	No	32	86.7	155.2	27.4	2	515	5	5	12	91	325	500	515	515
Asthma	Yes	2	7.5	3.5	2.5	5	10	5	5	7.5	10	10	10	10	10
Angina	No	33	83.9	153.6	26.7	2	515	5	5	10	90	325	500	515	515
Angina	Yes	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Bronchitis/Emphysema	No	33	84.1	153.5	26.7	2	515	5	5	10	90	325	500	515	515
Bronchitis/Emphysema	Yes	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15

- = Indicates missing data.
DK = The respondent replied “don’t know”.
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-19. Time Spent (minutes/day) in Selected Outdoor Locations Whole Population and Doers Only, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
School Grounds/Playground—Whole Population															
Birth to <1	63	2	0	0	0	0	0	0	0	0	0	0	0	53	140
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	4	0	0	0	0	0	0	0	0	0	0	50	131	175
3 to <6	357	5	0	0	0	0	0	0	0	0	0	0	64	127	625
6 to <11	497	8	0	0	0	0	0	0	0	0	10	60	121	170	315
11 to <16	466	10	0	0	0	0	0	0	0	0	20	80	120	160	570
16 to <21	481	8	0	0	0	0	0	0	0	0	0	50	135	180	510
School Grounds/Playground—Doers Only															
Birth to <1	1	-	140	-	-	-	-	-	-	-	-	-	-	-	140
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	5	-	10	-	-	-	-	-	-	-	-	-	-	-	175
3 to <6	12	138	20	22	24	31	42	59	118	138	150	364	521	573	625
6 to <11	52	80	10	10	10	10	15	30	59	106	169	217	280	298	315
11 to <16	62	72	3	4	5	5	5	21	53	95	149	178	217	360	570
16 to <21	34	116	10	10	10	13	18	46	95	161	201	305	418	464	510
Parks or Golf Courses—Whole Population															
Birth to <1	63	3	0	0	0	0	0	0	0	0	0	0	45	63	85
1 to <2	118	3	0	0	0	0	0	0	0	0	0	0	0	25	360
2 to <3	118	12	0	0	0	0	0	0	0	0	0	24	126	246	755
3 to <6	357	10	0	0	0	0	0	0	0	0	0	71	163	220	585
6 to <11	497	16	0	0	0	0	0	0	0	0	0	72	328	483	665
11 to <16	466	19	0	0	0	0	0	0	0	0	0	114	265	452	1,065
16 to <21	481	22	0	0	0	0	0	0	0	0	0	150	381	546	870
Parks or Golf Courses—Doers Only															
Birth to <1	3	-	30	-	-	-	-	-	-	-	-	-	-	-	85
1 to <2	2	-	30	-	-	-	-	-	-	-	-	-	-	-	360
2 to <3	7	-	21	-	-	-	-	-	-	-	-	-	-	-	755
3 to <6	26	144	25	26	28	31	44	63	113	165	273	388	505	545	585
6 to <11	34	236	25	30	35	43	52	73	123	394	568	644	662	663	665
11 to <16	38	237	15	15	15	15	27	86	164	266	470	851	954	1,010	1,065
16 to <21	47	225	1	7	14	15	24	60	160	308	557	633	677	773	870
Pool, River, or Lake—Whole Population															
Birth to <1	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to <2	118	1	0	0	0	0	0	0	0	0	0	0	0	0	118
2 to <3	118	12	0	0	0	0	0	0	0	0	0	14	228	352	435
3 to <6	357	5	0	0	0	0	0	0	0	0	0	0	85	163	630
6 to <11	497	9	0	0	0	0	0	0	0	0	0	0	220	295	375
11 to <16	466	4	0	0	0	0	0	0	0	0	0	0	60	160	235
16 to <21	481	8	0	0	0	0	0	0	0	0	0	0	145	240	570
Pool, River, or Lake—Doers Only															
Birth to <1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	1	-	118	-	-	-	-	-	-	-	-	-	-	-	118
2 to <3	6	-	95	-	-	-	-	-	-	-	-	-	-	-	435
3 to <6	9	-	45	-	-	-	-	-	-	-	-	-	-	-	630
6 to <11	24	178	25	26	27	32	46	75	155	294	319	359	370	373	375
11 to <16	16	121	58	58	59	59	60	60	85	206	225	228	232	234	235
16 to <21	22	179	20	22	24	31	40	55	125	238	415	548	564	567	570

- = Indicates missing data.
N = Doer sample size.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only

Outdoors on School Grounds/Playground

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		259	98.4	110.1	6.8	1	690	5	30	70	120	208	300	540	570
Sex	Male	0.136	118.0	126.4	10.8	1	690	10	35	85	149	255	370	555	625
Sex	Female	123	76.7	83.9	7.6	1	570	5	20	51	120	180	225	270	440
Age (years)	-	2	275.0	374.8	265.0	10	540	10	10	275	540	540	540	540	540
Age (years)	1 to 4	9	85.0	61.1	20.4	10	175	10	30	65	140	175	175	175	175
Age (years)	5 to 11	64	88.0	95.6	12.0	5	625	10	30	60	120	170	220	315	625
Age (years)	12 to 17	76	78.7	88.2	10.1	3	570	5	25	55	105	165	225	370	570
Age (years)	18 to 64	101	119.8	127.6	12.7	1	690	5	30	85	165	240	360	540	555
Age (years)	>64	7	65.0	47.3	17.9	5	150	5	30	60	95	150	150	150	150
Race	White	208	98.2	106.5	7.4	1	690	9	30	70	125	190	281	510	555
Race	Black	23	128.4	157.5	32.9	5	570	5	25	67	170	300	540	570	570
Race	Asian	6	59.0	66.1	27.0	10	179	10	10	35	85	179	179	179	179
Race	Some Others	7	70.0	59.7	22.6	10	180	10	10	60	105	180	180	180	180
Race	Hispanic	15	83.7	103.0	26.6	1	370	1	10	30	120	228	370	370	370
Hispanic	No	225	102.6	113.7	7.6	3	690	9	30	70	125	210	300	540	570
Hispanic	Yes	32	71.2	79.9	14.1	1	370	1	13	33	110	150	228	370	370
Hispanic	DK	2	57.5	31.8	22.5	35	80	35	35	58	80	80	80	80	80
Employment	-	143	80.2	88.0	7.4	3	625	9	25	55	115	160	215	315	570
Employment	Full Time	48	130.3	127.2	18.4	1	555	10	40	85	180	300	360	555	555
Employment	Part Time	24	129.7	158.9	32.4	3	690	10	35	85	144	228	510	690	690
Employment	Not Employed	42	95.4	94.8	14.6	1	440	5	30	80	120	180	235	440	440
Employment	Refused	2	322.5	307.6	217.5	105	540	105	105	323	540	540	540	540	540
Education	-	162	86.6	94.6	7.4	3	625	10	27	60	120	170	220	370	570
Education	< High School	11	124.8	171.9	51.8	1	540	1	5	45	180	345	540	540	540
Education	High School Graduate	33	113.6	110.7	19.3	3	555	5	30	90	160	240	290	555	555
Education	< College	19	129.8	147.4	33.8	5	510	5	33	70	210	440	510	510	510
Education	College Graduate	19	122.1	149.9	34.4	5	690	5	50	85	125	235	690	690	690
Education	Post Graduate	15	102.9	98.1	25.3	1	360	1	30	75	125	235	360	360	360
Census Region	Northeast	66	106.0	115.2	14.2	5	690	10	30	85	150	190	281	540	690
Census Region	Midwest	53	86.1	109.2	15.0	3	540	5	20	50	115	190	290	510	540
Census Region	South	82	85.5	92.4	10.2	1	570	5	30	60	115	180	255	360	570
Census Region	West	58	119.3	125.6	16.5	1	625	10	30	85	160	235	440	555	625
Day Of Week	Weekday	205	87.0	105.5	7.4	1	625	5	25	55	115	180	240	540	555
Day Of Week	Weekend	54	141.5	117.1	15.9	10	690	25	67	113	180	290	345	440	690
Season	Winter	53	72.2	102.0	14.0	1	555	3	20	35	85	130	315	440	555
Season	Spring	88	108.6	96.5	10.3	5	540	10	45	85	148	215	255	510	540
Season	Summer	65	116.4	137.9	17.1	5	690	10	30	75	135	270	360	625	690
Season	Fall	53	85.5	96.2	13.2	5	540	5	20	55	120	180	235	345	540
Asthma	No	237	100.9	113.2	7.4	1	690	5	30	70	120	215	315	540	570
Asthma	Yes	22	70.9	62.0	13.2	5	179	10	15	45	145	160	165	179	179
Angina	No	254	99.1	110.8	7.0	1	690	5	30	69	120	208	300	540	570
Angina	Yes	5	61.2	53.4	23.9	1	130	1	15	70	90	130	130	130	130
Bronchitis/Emphysema	No	248	100.6	111.6	7.1	1	690	5	30	71	125	210	300	540	570
Bronchitis/Emphysema	Yes	10	52.7	45.4	14.4	9	160	9	22	44	60	125	160	160	160
Bronchitis/Emphysema	DK	1	15.0	0.0	0.0	15	15	15	15	15	15	15	15	15	15

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoor Playing

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		59	97.4	95.4	12.4	5	435	15	45	60	110	210	360	420	435
Gender	Male	26	108.2	94.8	18.6	15	360	15	60	75	135	280	345	360	360
Gender	Female	33	88.8	96.4	16.8	5	435	5	45	60	100	150	420	435	435
Age (years)	-	1	170.0	-	-	170	170	170	170	170	170	170	170	170	170
Age (years)	1 to 4	4	83.3	89.7	44.8	15	210	15	20	54	147	210	210	210	210
Age (years)	5 to 11	9	148.3	144.3	48.1	5	360	5	55	60	280	360	360	360	360
Age (years)	12 to 17	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Age (years)	18 to 64	40	92.1	86.4	13.7	20	435	28	53	65	103	143	307	435	435
Age (years)	> 64	4	52.5	15.0	7.5	30	60	30	45	60	60	60	60	60	60
Race	White	50	93.9	90.2	12.8	5	420	15	45	60	100	202	345	390	420
Race	Black	2	86.5	37.5	26.5	60	113	60	60	87	113	113	113	113	113
Race	Asian	1	100.0	-	-	100	100	100	100	100	100	100	100	100	100
Race	Some Others	1	30.0	-	-	30	30	30	30	30	30	30	30	30	30
Race	Hispanic	5	149.0	164.9	73.7	20	435	20	60	110	120	435	435	435	435
Hispanic	No	51	93.3	89.7	12.6	5	420	15	45	60	100	194	345	360	420
Hispanic	Yes	8	123.1	130.2	46.0	20	435	20	60	90	115	435	435	435	435
Employment	-	15	123.5	124.4	32.1	5	360	5	15	60	210	345	360	360	360
Employment	Full Time	15	67.2	30.9	8.0	20	135	20	45	60	85	113	135	135	135
Employment	Part Time	7	87.7	54.1	20.5	30	194	30	60	60	110	194	194	194	194
Employment	Not Employed	22	103.2	110.1	23.5	25	435	30	45	60	105	150	420	435	435
Education	-	15	123.5	124.4	32.1	5	360	5	15	60	210	345	360	360	360
Education	< High School	5	57.0	6.7	3.0	45	60	45	60	60	60	60	60	60	60
Education	High School Graduate	10	148.5	150.5	47.6	30	435	30	60	95	135	428	435	435	435
Education	< College	18	74.7	45.2	10.6	20	194	20	45	60	95	150	194	194	194
Education	College Graduate	8	75.4	35.5	12.5	30	120	30	45	75	107	120	120	120	120
Education	Post Graduate	3	58.3	24.7	14.2	30	75	30	30	70	75	75	75	75	75
Census Region	Northeast	17	114.1	103.3	25.0	15	360	15	60	70	120	345	360	360	360
Census Region	Midwest	12	78.6	32.4	9.3	30	150	30	60	65	98	113	150	150	150
Census Region	South	15	109.7	109.5	28.3	30	420	30	30	60	135	280	420	420	420
Census Region	West	15	81.2	107.7	27.8	5	435	5	20	60	105	165	435	435	435
Day Of Week	Weekday	42	86.8	79.2	12.2	5	360	15	30	60	100	165	280	360	360
Day Of Week	Weekend	17	123.5	126.0	30.6	25	435	25	45	60	120	420	435	435	435
Season	Winter	10	66.5	46.3	14.6	5	150	5	30	60	105	135	150	150	150
Season	Spring	10	135.3	114.7	36.3	45	435	45	60	108	165	303	435	435	435
Season	Summer	31	92.4	95.0	17.1	5	420	15	45	60	100	210	345	420	420
Season	Fall	8	108.0	115.7	40.9	25	360	25	30	68	142	360	360	360	360
Asthma	No	56	94.8	91.5	12.2	5	435	15	45	60	108	194	360	420	435
Asthma	Yes	3	145.0	173.9	100.4	30	345	30	30	60	345	345	345	345	345
Angina	No	58	97.0	96.1	12.6	5	435	15	45	60	105	210	360	420	435
Angina	Yes	1	120.0	-	-	120	120	120	120	120	120	120	120	120	120
Bronchitis/Emphysema	No	55	90.1	87.1	11.7	5	435	15	45	60	100	170	345	360	435
Bronchitis/Emphysema	Yes	4	198.5	157.5	78.8	60	420	60	90	157	307	420	420	420	420

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors at a Park/Golf Course

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		506	198.6	190.2	8.5	1	1,065	20	60	135	270	465	590	748	870
Sex	Male	291	205.8	183.1	10.7	1	1,015	25	60	150	285	510	590	730	755
Sex	Female	214	187.7	199.4	13.6	5	1,065	15	55	120	250	435	590	870	930
Sex	Refused	1	420.0	-	-	420	420	420	420	420	420	420	420	420	420
Age (years)	-	10	122.4	60.2	19.0	30	225	30	60	120	160	202	225	225	225
Age (years)	1 to 4	21	149.9	176.3	38.5	21	755	25	50	85	150	360	425	755	755
Age (years)	5 to 11	54	207.6	184.5	25.1	25	665	35	70	125	275	555	635	660	665
Age (years)	12 to 17	52	238.5	242.2	33.6	15	1,065	15	60	148	338	590	840	915	1,065
Age (years)	18 to 64	314	197.8	185.9	10.5	1	1,015	20	60	150	270	440	580	748	870
Age (years)	>64	55	189.0	182.9	24.7	10	735	20	30	120	300	510	570	590	735
Race	White	441	205.3	195.3	9.3	1	1,065	20	60	150	275	480	605	795	915
Race	Black	19	114.5	103.7	23.8	15	425	15	30	90	155	240	425	425	425
Race	Asian	8	185.6	233.4	82.5	30	665	30	33	48	315	665	665	665	665
Race	Some Others	16	171.3	154.2	38.6	30	560	30	58	120	235	405	560	560	560
Race	Hispanic	20	169.5	135.8	30.4	30	555	33	77	145	205	373	495	555	555
Race	Refused	2	75.0	63.6	45.0	30	120	30	30	75	120	120	120	120	120
Hispanic	No	469	202.7	193.6	8.9	1	1,065	20	60	135	270	480	605	755	915
Hispanic	Yes	34	154.8	135.0	23.2	15	555	30	60	138	175	310	555	555	555
Hispanic	DK	1	10.0	-	-	10	10	10	10	10	10	10	10	10	10
Hispanic	Refused	2	75.0	63.6	45.0	30	120	30	30	75	120	120	120	120	120
Employment	-	128	208.2	209.6	18.5	15	1,065	25	60	120	275	555	645	840	915
Employment	Full Time	201	195.8	189.0	13.3	8	1,015	25	60	135	270	450	570	748	930
Employment	Part Time	41	213.5	215.6	33.7	20	870	20	60	132	260	540	660	870	870
Employment	Not Employed	132	190.9	166.0	14.5	1	810	15	60	160	270	420	525	730	735
Employment	Refused	4	130.0	106.8	53.4	30	280	30	60	105	200	280	280	280	280
Education	-	140	202.7	204.7	17.3	15	1,065	21	60	120	270	499	640	840	915
Education	< High School	32	180.8	207.8	36.7	30	995	30	30	110	245	385	570	995	995
Education	High School Graduate	108	219.7	197.2	19.0	10	1,015	20	78	163	281	545	625	730	810
Education	<College	93	191.6	171.2	17.8	1	870	15	60	150	275	440	510	748	870
Education	College Graduate	83	203.5	183.1	20.1	5	930	23	60	145	270	450	590	795	930
Education	Post Graduate	50	157.8	166.6	23.6	10	735	20	45	75	255	338	555	703	735
Census Region	Northeast	106	184.9	177.4	17.2	1	1,065	20	60	124	240	450	574	635	660
Census Region	Midwest	124	194.6	188.7	16.9	10	1,015	30	60	135	255	420	590	735	995
Census Region	South	136	218.8	211.5	18.1	10	930	20	60	150	325	525	720	840	915
Census Region	West	140	192.9	179.4	15.2	5	870	18	58	131	273	430	575	755	810
Day Of Week	Weekday	276	196.0	189.3	11.4	5	1,015	20	60	145	253	510	625	748	840
Day Of Week	Weekend	230	201.7	191.8	12.6	1	1,065	20	60	130	280	455	580	810	915
Season	Winter	83	209.1	195.2	21.4	15	1,065	30	60	165	275	440	660	795	1,065
Season	Spring	163	168.5	159.1	12.5	8	930	20	50	120	235	360	510	570	755
Season	Summer	192	219.6	199.9	14.4	5	1,015	20	65	155	290	535	630	840	915
Season	Fall	68	198.7	217.9	26.4	1	995	20	60	118	280	555	735	810	995
Asthma	No	466	192.1	178.8	8.3	1	1,015	20	60	135	270	450	580	700	755
Asthma	Yes	38	284.5	288.7	46.8	30	1,065	35	90	170	390	870	995	1,065	1,065
Asthma	DK	2	75.0	63.6	45.0	30	120	30	30	75	120	120	120	120	120
Angina	No	494	197.9	189.8	8.5	1	1,065	20	60	135	270	459	590	755	915
Angina	Yes	9	247.8	235.3	78.4	35	730	35	60	120	330	730	730	730	730
Angina	DK	3	170.0	170.6	98.5	30	360	30	30	120	360	360	360	360	360
Bronchitis/Emphysema	No	490	197.0	184.6	8.3	1	1,065	20	60	145	270	455	585	735	840
Bronchitis/Emphysema	Yes	14	273.1	339.1	90.6	20	995	20	75	100	280	930	995	995	995
Bronchitis/Emphysema	DK	2	75.0	63.6	45.0	30	120	30	30	75	120	120	120	120	120

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors at a Pool/River/Lake

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		283	209.6	185.7	11.0	5	1,440	25	60	150	296	480	570	670	690
Sex	Male	152	229.8	202.7	16.4	10	1,440	30	83	174	305	510	600	690	900
Sex	Female	131	186.0	161.3	14.1	5	645	20	60	135	280	440	550	630	630
Age (years)	-	6	175.0	157.0	64.1	60	480	60	85	115	195	480	480	480	480
Age (years)	1 to 4	14	250.6	177.5	47.4	90	630	90	130	168	370	560	630	630	630
Age (years)	5 to 11	29	175.4	117.9	21.9	25	390	30	60	145	293	365	375	390	390
Age (years)	12 to 17	22	128.3	94.4	20.1	40	420	58	60	83	210	225	235	420	420
Age (years)	18 to 64	187	224.5	203.8	14.9	5	1,440	20	60	150	320	511	615	690	900
Age (years)	>64	25	194.2	161.8	32.4	20	525	30	60	115	277	480	510	525	525
Race	White	246	201.6	182.3	11.6	5	1,440	25	60	145	285	440	560	670	690
Race	Black	12	380.6	231.9	66.9	20	690	20	178	450	563	615	690	690	690
Race	Asian	4	265.0	247.1	123.5	30	505	30	53	263	478	505	505	505	505
Race	Some Others	5	237.0	129.9	58.1	70	435	70	220	225	235	435	435	435	435
Race	Hispanic	12	161.0	131.7	38.0	20	390	20	53	113	265	375	390	390	390
Race	Refused	4	243.8	208.6	104.3	90	550	90	115	168	373	550	550	550	550
Hispanic	No	259	208.9	187.8	11.7	5	1,440	25	60	150	295	480	585	670	690
Hispanic	Yes	20	210.9	160.1	35.8	20	540	29	88	155	338	451	526	540	540
Hispanic	Refused	4	243.8	208.6	104.3	90	550	90	115	168	373	550	550	550	550
Employment	-	66	176.9	131.3	16.2	25	630	40	70	143	235	370	420	560	630
Employment	Full Time	119	210.7	176.1	16.1	10	900	20	65	150	298	510	600	645	670
Employment	Part Time	26	217.0	199.9	39.2	20	670	30	60	120	320	570	580	670	670
Employment	Not Employed	69	238.9	236.2	28.4	5	1,440	20	65	145	370	510	630	690	1,440
Employment	Refused	3	141.7	52.5	30.3	90	195	90	90	140	195	195	195	195	195
Education	-	73	172.9	130.0	15.2	20	630	30	70	140	225	370	420	560	630
Education	< High School	18	267.6	159.4	37.6	40	600	40	145	248	375	525	600	600	600
Education	High School Graduate	69	213.2	224.1	27.0	10	1,440	20	60	145	285	511	670	690	1,440
Education	< College	62	233.3	192.4	24.4	5	690	30	65	150	360	550	580	615	690
Education	College Graduate	37	230.9	187.3	30.8	14	645	20	70	173	400	505	630	645	645
Education	Post Graduate	24	172.7	197.0	40.2	20	900	25	45	113	240	370	480	900	900
Census Region	Northeast	61	220.7	172.4	22.1	30	900	30	60	180	325	390	510	670	900
Census Region	Midwest	41	219.2	257.2	40.2	10	1,440	20	60	120	280	480	600	1,440	1,440
Census Region	South	111	182.2	161.3	15.3	5	670	20	60	118	280	420	525	630	645
Census Region	West	70	237.6	181.8	21.7	25	690	40	90	180	300	548	615	690	690
Day Of Week	Weekday	165	188.8	179.9	14.0	10	1,440	30	60	125	255	420	511	615	670
Day Of Week	Weekend	118	238.6	190.4	17.5	5	900	20	75	188	350	555	630	690	690
Season	Winter	30	173.2	181.7	33.2	20	630	20	40	103	270	493	585	630	630
Season	Spring	77	206.5	163.6	18.6	15	690	30	80	180	288	480	555	670	690
Season	Summer	151	219.7	196.8	16.0	5	1,440	26	65	155	300	445	580	630	900
Season	Fall	25	201.4	189.7	37.9	20	670	45	70	105	310	510	510	670	670
Asthma	No	262	209.0	188.2	11.6	5	1,440	25	60	150	295	480	580	670	690
Asthma	Yes	17	238.8	162.0	39.3	15	570	15	105	225	350	525	570	570	570
Asthma	DK	4	121.3	59.2	29.6	60	195	60	75	115	168	195	195	195	195
Angina	No	272	205.9	185.2	11.2	5	1,440	25	60	145	291	480	570	645	690
Angina	Yes	8	359.4	178.8	63.2	60	690	60	288	340	435	690	690	690	690
Angina	DK	3	141.7	52.5	30.3	90	195	90	90	140	195	195	195	195	195
Bronchitis/Emphysema	No	266	211.0	189.1	11.6	5	1,440	25	60	150	296	480	580	670	690
Bronchitis/Emphysema	Yes	14	197.1	131.5	35.2	15	440	15	90	173	300	370	440	440	440
Bronchitis/Emphysema	DK	3	141.7	52.5	30.3	90	195	90	90	140	195	195	195	195	195

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors on a Sidewalk, Street, or in the Neighborhood

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		896	85.8	133.8	4.5	1	1,440	2	15	40	90	223	405	565	615
Sex	Male	409	108.8	168.1	8.3	1	1,440	3	20	45	120	330	525	615	710
Sex	Female	487	66.5	91.9	4.2	1	580	1	15	35	75	152	255	435	465
Age (years)	-	15	72.5	69.4	17.9	1	290	1	40	55	90	120	290	290	290
Age (years)	1 to 4	30	54.8	52.7	9.6	1	235	2	10	43	78	125	158	235	235
Age (years)	5 to 11	75	110.8	116.8	13.5	1	540	5	20	65	178	240	410	465	540
Age (years)	12 to 17	74	52.6	74.8	8.7	1	435	2	15	30	60	125	200	338	435
Age (years)	18 to 64	580	94.3	153.9	6.4	1	1,440	2	15	40	83	278	480	600	690
Age (years)	>64	122	59.4	61.5	5.6	1	380	2	20	40	75	120	190	235	270
Race	White	727	85.7	136.5	5.1	1	1,440	2	15	41	90	215	405	570	675
Race	Black	87	89.2	132.7	14.2	1	565	2	10	35	120	324	426	540	565
Race	Asian	11	88.7	114.0	34.4	2	405	2	30	45	120	149	405	405	405
Race	Some Others	18	80.6	106.0	25.0	10	420	10	20	40	75	240	420	420	420
Race	Hispanic	42	71.4	110.8	17.1	1	525	1	20	40	75	135	290	525	525
Race	Refused	11	122.9	117.7	35.5	2	310	2	40	60	290	300	310	310	310
Hispanic	No	807	87.5	136.1	4.8	1	1,440	2	15	45	90	225	410	565	600
Hispanic	Yes	79	67.8	110.3	12.4	1	615	1	15	30	62	140	300	525	615
Hispanic	DK	1	2.0	-	-	2	2	2	2	2	2	2	2	2	2
Hispanic	Refused	9	100.8	115.9	38.6	2	310	2	40	60	90	310	310	310	310
Employment	-	176	79.2	96.3	7.3	1	540	2	15	45	110	200	260	435	465
Employment	Full Time	384	102.2	169.5	8.7	1	1,440	3	15	41	75	330	525	600	710
Employment	Part Time	74	74.4	113.9	13.2	1	795	1	15	43	86	180	255	390	795
Employment	Not Employed	255	70.0	94.0	5.9	1	615	1	15	40	85	152	270	380	485
Employment	Refused	7	45.1	36.6	13.8	2	90	2	4	40	90	90	90	90	90
Education	-	198	74.9	92.3	6.6	1	540	2	15	41	90	185	240	435	465
Education	< High School	56	131.2	247.3	33.0	1	1,440	1	15	40	118	465	710	735	1,440
Education	High School Graduate	223	100.2	146.9	9.8	1	795	5	20	45	95	275	480	600	680
Education	< College	172	77.2	128.8	9.8	1	675	1	10	30	75	180	435	570	600
Education	College Graduate	138	76.3	106.6	9.1	1	600	3	20	45	70	205	310	485	565
Education	Post Graduate	109	78.2	121.3	11.6	1	710	5	20	45	60	200	330	560	570
Census Region	Northeast	202	89.1	132.3	9.3	1	735	3	15	45	90	235	410	530	570
Census Region	Midwest	193	87.9	153.3	11.0	1	1,440	2	15	30	85	240	355	565	600
Census Region	South	298	79.9	125.5	7.3	1	710	2	15	35	75	185	420	532	680
Census Region	West	203	89.1	127.9	9.0	1	795	1	20	45	105	210	300	570	615
Day Of Week	Weekday	642	86.7	143.9	5.7	1	1,440	2	15	40	80	223	426	585	680
Day Of Week	Weekend	254	83.5	104.2	6.5	1	565	2	25	45	90	220	310	440	480
Season	Winter	210	73.5	144.3	10.0	1	1,440	1	15	33	60	160	270	560	710
Season	Spring	242	97.9	137.2	8.8	1	795	4	25	45	120	240	435	570	675
Season	Summer	276	84.0	123.1	7.4	1	690	4	15	45	90	200	420	525	580
Season	Fall	168	86.6	131.9	10.2	1	710	2	15	40	90	240	405	600	615
Asthma	No	832	86.1	129.5	4.5	1	795	2	15	40	90	225	418	565	600
Asthma	Yes	57	85.6	193.1	25.6	1	1,440	1	15	35	90	180	235	260	1,440
Asthma	DK	7	48.9	28.0	10.6	2	90	2	30	60	60	90	90	90	90
Angina	No	857	86.2	134.9	4.6	1	1,440	2	15	40	90	223	410	565	615
Angina	Yes	33	81.7	117.4	20.4	1	465	1	17	45	60	250	380	465	465
Angina	DK	6	52.0	29.3	11.9	2	90	2	40	60	60	90	90	90	90
Bronchitis/Emphysema	No	855	84.8	132.3	4.5	1	1,440	2	15	40	85	225	405	560	600
Bronchitis/Emphysema	Yes	34	117.7	176.4	30.3	3	735	8	30	45	120	215	690	735	735
Bronchitis/Emphysema	DK	7	46.3	27.5	10.4	2	90	2	32	40	60	90	90	90	90

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

At Home in the Yard or Other Areas Outside the House

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		2,308	137.6	144.1	3.0	1	1,290	10	40	90	180	320	420	570	660
Sex	Male	1,198	158.4	160.0	4.6	1	1,290	10	60	120	198	360	500	627	730
Sex	Female	1,107	114.9	120.9	3.6	1	1,065	5	30	75	150	285	360	450	560
Sex	Refused	3	183.3	60.3	34.8	120	240	120	120	190	240	240	240	240	240
Age (years)	-	27	167.4	164.5	31.7	2	600	5	60	120	230	395	600	600	600
Age (years)	1 to 4	151	135.3	111.5	9.1	5	630	25	60	90	180	305	345	450	480
Age (years)	5 to 11	271	150.6	135.1	8.2	2	1,250	20	60	120	190	310	405	553	570
Age (years)	12 to 17	157	113.2	117.7	9.4	2	660	5	30	80	150	240	405	462	610
Age (years)	18 to 64	1,301	136.4	147.9	4.1	1	1,080	5	30	90	180	330	435	570	715
Age (years)	>64	401	141.1	155.2	7.8	1	1,290	10	45	90	180	302	465	598	660
Race	White	1,966	139.0	145.5	3.3	1	1,290	10	40	90	180	330	435	570	670
Race	Black	173	128.4	144.6	11.0	1	1,250	5	30	95	180	270	390	462	745
Race	Asian	21	101.2	88.5	19.3	12	360	15	35	90	125	210	240	360	360
Race	Some Others	37	183.5	161.9	26.6	2	750	3	84	120	270	380	553	750	750
Race	Hispanic	83	106.1	96.8	10.6	2	610	5	35	75	145	240	270	330	610
Race	Refused	28	152.3	151.0	28.5	5	600	5	60	98	210	360	510	600	600
Hispanic	No	2,122	137.7	144.3	3.1	1	1,290	10	40	90	180	320	420	570	670
Hispanic	Yes	153	125.0	134.3	10.9	1	750	5	30	85	150	270	435	575	630
Hispanic	DK	10	213.8	192.2	60.8	3	585	3	60	145	380	503	585	585	585
Hispanic	Refused	23	176.7	156.6	32.6	5	600	5	60	160	240	360	510	600	600
Employment	-	581	137.5	125.6	5.2	2	1,250	15	60	110	180	300	370	480	570
Employment	Full Time	807	131.1	150.7	5.3	1	1,080	5	30	80	175	307	450	600	745
Employment	Part Time	166	126.1	134.1	10.4	1	1,080	10	30	78	180	300	360	450	485
Employment	Not Employed	739	146.1	149.7	5.5	1	1,290	10	45	100	185	360	465	585	655
Employment	Refused	15	198.0	239.0	61.7	5	660	5	30	120	465	600	660	660	660
Education	-	615	136.3	125.7	5.1	2	1,250	15	60	105	180	300	370	480	570
Education	< High School	236	161.0	186.5	12.1	2	1,290	10	45	105	195	390	510	765	915
Education	High School Graduate	618	144.7	144.9	5.8	1	840	5	40	100	195	360	479	555	660
Education	< College	381	128.8	141.2	7.2	1	1,080	5	35	85	175	300	400	585	720
Education	College Graduate	251	123.0	135.8	8.6	1	750	10	30	75	160	300	390	575	690
Education	Post Graduate	207	127.1	150.0	10.4	1	1,065	5	30	78	150	320	435	570	630
Census Region	Northeast	473	137.7	132.8	6.1	1	750	10	45	90	185	317	420	532	600
Census Region	Midwest	456	138.9	155.7	7.3	2	1,290	10	45	90	180	300	440	575	690
Census Region	South	832	136.5	146.7	5.1	1	1,080	10	35	90	180	310	420	570	730
Census Region	West	547	138.2	139.9	6.0	1	750	5	36	90	180	330	460	570	630
Day Of Week	Weekday	1,453	126.9	131.6	3.5	1	1,250	5	35	90	165	300	395	553	610
Day Of Week	Weekend	855	155.7	161.7	5.5	1	1,290	10	45	110	210	360	475	630	745
Season	Winter	399	112.2	136.0	6.8	1	1,080	5	30	60	140	300	380	540	690
Season	Spring	787	149.7	139.2	5.0	1	915	10	60	120	195	338	430	555	660
Season	Summer	796	143.7	155.9	5.5	1	1,290	10	45	99	180	330	450	610	715
Season	Fall	326	124.5	130.5	7.2	1	720	10	35	88	160	300	380	510	655
Asthma	No	2,129	137.7	144.4	3.1	1	1,290	10	40	90	180	315	420	570	690
Asthma	Yes	166	131.6	136.0	10.6	1	670	10	30	90	165	345	450	553	610
Asthma	DK	13	188.5	192.1	53.3	5	600	5	60	90	300	480	600	600	600
Angina	No	2,228	136.5	141.1	3.0	1	1,290	10	41	90	180	315	420	570	660
Angina	Yes	63	158.7	216.3	27.3	2	1,080	5	30	75	180	420	485	1,065	1,080
Angina	DK	17	199.1	191.3	46.4	5	600	5	35	120	325	480	600	600	600
Bronchitis/Emphysema	No	2,191	138.8	145.0	3.1	1	1,290	10	45	90	180	320	430	570	690
Bronchitis/Emphysema	Yes	105	104.4	111.3	10.9	1	553	5	30	60	145	270	360	415	475
Bronchitis/Emphysema	DK	12	207.5	192.2	55.5	5	600	5	60	140	330	480	600	600	600

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors in Parking Lot

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		226	70.7	126.7	8.4	1	910	2	10	20	60	190	309	510	580
Gender	Male	106	100.3	167.2	16.2	1	910	5	15	30	110	315	495	580	720
Gender	Female	120	44.6	64.8	5.9	1	295	1	5	20	47	168	188	248	285
Age (years)	-	3	135.0	195.0	112.6	15	360	15	15	30	360	360	360	360	360
Age (years)	1 to 4	11	39.8	38.4	11.6	5	110	5	10	20	90	90	110	110	110
Age (years)	5 to 11	5	62.0	63.7	28.5	5	170	5	30	45	60	170	170	170	170
Age (years)	12 to 17	12	93.8	90.8	26.2	5	248	5	18	52	163	238	248	248	248
Age (years)	18 to 64	182	70.0	132.7	9.8	1	910	2	10	20	60	190	309	550	720
Age (years)	> 64	13	74.5	127.9	35.5	1	465	1	10	25	60	180	465	465	465
Race	White	180	72.1	128.3	9.6	1	910	2	10	21	64	205	302	510	720
Race	Black	18	102.4	167.8	39.5	2	580	2	6	28	130	495	580	580	580
Race	Asian	3	21.7	7.6	4.4	15	30	15	15	20	30	30	30	30	30
Race	Some Others	5	50.0	46.1	20.6	5	115	5	10	45	75	115	115	115	115
Race	Hispanic	17	25.7	39.4	9.5	1	165	1	10	10	20	60	165	165	165
Race	Refused	3	135.0	195.0	112.6	15	360	15	15	30	360	360	360	360	360
Hispanic	No	196	69.3	114.1	8.1	1	720	2	10	24	68	190	295	495	580
Hispanic	Yes	25	42.9	103.3	20.7	1	510	1	5	10	20	75	165	510	510
Hispanic	DK	2	465.0	629.3	445.0	20	910	20	20	465	910	910	910	910	910
Hispanic	Refused	3	135.0	195.0	112.6	15	360	15	15	30	360	360	360	360	360
Employment	-	26	55.6	59.9	11.7	5	238	5	15	30	90	145	170	238	238
Employment	Full Time	117	83.3	155.1	14.3	1	910	2	10	20	60	240	495	580	720
Employment	Part Time	37	75.4	114.7	18.9	1	465	1	5	21	90	180	450	465	465
Employment	Not Employed	43	37.1	46.8	7.1	1	210	1	10	20	60	90	134	210	210
Employment	Refused	3	135.0	195.0	112.6	15	360	15	15	30	360	360	360	360	360
Education	-	33	69.7	85.6	14.9	1	360	5	15	30	90	180	248	360	360
Education	< High School	16	73.3	176.8	44.2	2	720	2	8	23	33	165	720	720	720
Education	High School Graduate	83	83.0	124.4	13.7	1	580	5	10	25	90	215	315	495	580
Education	< College	49	75.9	162.7	23.2	1	910	2	10	20	60	210	450	910	910
Education	College Graduate	23	48.8	107.2	22.3	1	510	2	5	10	30	130	135	510	510
Education	Post Graduate	22	35.5	54.5	11.6	1	185	1	5	15	30	115	180	185	185
Census Region	Northeast	56	57.4	82.6	11.0	1	495	1	13	28	75	135	180	295	495
Census Region	Midwest	48	73.4	118.6	17.1	1	550	5	10	25	63	248	315	550	550
Census Region	South	75	57.9	106.4	12.3	1	720	2	7	20	50	185	238	360	720
Census Region	West	47	104.3	189.9	27.7	3	910	5	10	20	90	450	510	910	910
Day Of Week	Weekday	154	64.9	136.7	11.0	1	910	2	7	20	43	180	450	550	720
Day Of Week	Weekend	72	83.3	101.7	12.0	1	465	5	15	35	113	240	309	360	465
Season	Winter	45	50.5	64.7	9.6	2	309	5	15	30	63	130	180	309	309
Season	Spring	57	82.9	131.2	17.4	1	495	1	10	20	90	240	465	495	495
Season	Summer	75	72.0	146.2	16.9	1	910	2	10	20	60	205	315	580	910
Season	Fall	49	73.1	133.2	19.0	1	720	1	10	20	75	205	295	720	720
Asthma	No	204	63.0	109.4	7.7	1	720	2	10	20	60	180	248	495	510
Asthma	Yes	18	149.7	238.5	56.2	1	910	1	15	45	145	580	910	910	910
Asthma	DK	4	110.0	166.9	83.4	15	360	15	23	33	198	360	360	360	360
Angina	No	217	69.3	127.1	8.6	1	910	2	10	20	60	185	309	510	580
Angina	Yes	5	99.6	83.1	37.1	35	238	35	40	75	110	238	238	238	238
Angina	DK	4	113.8	164.8	82.4	15	360	15	23	40	205	360	360	360	360
Bronchitis/Emphysema	No	211	65.6	114.2	7.9	1	720	2	10	20	60	180	295	495	550
Bronchitis/Emphysema	Yes	11	142.4	266.0	80.2	1	910	1	10	40	180	240	910	910	910
Bronchitis/Emphysema	DK	4	146.3	160.8	80.4	15	360	15	23	105	270	360	360	360	360

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors at a Service Station or Gas Station

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		191	50.6	125.5	9.1	1	790	5	5	10	20	105	365	570	645
Gender	Male	90	73.5	150.0	15.8	1	645	5	5	10	30	325	495	600	645
Gender	Female	101	30.2	94.9	9.4	2	790	5	5	10	15	44	105	180	510
Age (years)	-	1	86.0	-	-	86	86	86	86	86	86	86	86	86	86
Age (years)	1 to 4	3	6.7	2.9	1.7	5	10	5	5	5	10	10	10	10	10
Age (years)	5 to 11	3	66.7	98.3	56.7	5	180	5	5	15	180	180	180	180	180
Age (years)	12 to 17	11	7.8	4.5	1.4	1	15	1	5	5	10	15	15	15	15
Age (years)	18 to 64	157	54.2	135.6	10.8	2	790	5	5	10	15	110	390	570	645
Age (years)	> 64	16	47.8	69.5	17.4	5	240	5	10	18	55	180	240	240	240
Race	White	170	50.9	124.0	9.5	2	790	5	5	10	20	108	365	520	600
Race	Black	11	80.7	191.4	57.7	4	645	4	5	5	44	140	645	645	645
Race	Asian	1	5.0	-	-	5	5	5	5	5	5	5	5	5	5
Race	Some Others	3	16.7	20.2	11.7	5	40	5	5	5	40	40	40	40	40
Race	Hispanic	5	10.2	7.6	3.4	1	20	1	5	10	15	20	20	20	20
Race	Refused	1	10.0	-	-	10	10	10	10	10	10	10	10	10	10
Hispanic	No	179	53.1	129.2	9.7	2	790	5	5	10	20	130	380	570	645
Hispanic	Yes	12	13.9	23.0	6.6	1	86	1	5	8	10	15	86	86	86
Employment	-	16	18.8	43.2	10.8	1	180	1	5	8	13	15	180	180	180
Employment	Full Time	110	55.8	136.8	13.0	2	645	5	5	10	15	99	495	570	600
Employment	Part Time	26	34.7	71.8	14.1	3	355	5	5	10	25	100	130	355	355
Employment	Not Employed	38	40.2	77.0	12.5	4	380	5	5	10	20	140	240	380	380
Employment	Refused	1	790.0	-	-	790	790	790	790	790	790	790	790	790	790
Education	-	18	17.8	40.7	9.6	1	180	1	5	8	15	15	180	180	180
Education	< High School	16	103.0	164.1	41.0	5	520	5	10	15	140	365	520	520	520
Education	High School Graduate	46	85.7	162.9	24.0	3	645	5	5	10	85	380	495	645	645
Education	< College	58	41.8	121.1	15.9	2	790	4	5	13	20	60	110	510	790
Education	College Graduate	30	36.6	111.6	20.4	2	570	4	5	7	15	30	270	570	570
Education	Post Graduate	23	10.0	6.4	1.3	5	30	5	5	10	10	20	20	30	30
Census Region	Northeast	33	59.7	149.2	26.0	2	600	3	5	10	20	105	570	600	600
Census Region	Midwest	48	28.6	77.6	11.2	2	510	5	5	10	15	60	110	510	510
Census Region	South	68	49.9	134.0	16.2	1	790	5	5	10	15	130	295	645	790
Census Region	West	42	69.8	135.5	20.9	4	520	5	5	13	40	270	390	520	520
Day Of Week	Weekday	122	58.4	145.1	13.1	2	790	5	5	10	20	130	495	600	645
Day Of Week	Weekend	69	36.8	79.0	9.5	1	390	4	5	10	15	88	240	380	390
Season	Winter	56	37.5	100.6	13.4	2	600	4	5	10	15	60	270	355	600
Season	Spring	54	80.1	157.5	21.4	1	645	5	5	10	60	380	510	570	645
Season	Summer	51	46.5	137.7	19.3	2	790	5	5	10	15	35	365	520	790
Season	Fall	30	28.8	58.9	10.8	3	295	5	5	9	15	93	130	295	295
Asthma	No	174	53.5	130.8	9.9	1	790	5	5	10	20	130	380	570	645
Asthma	Yes	16	15.8	25.7	6.4	2	110	2	5	8	15	20	110	110	110
Asthma	DK	1	100.0	-	-	100	100	100	100	100	100	100	100	100	100
Angina	No	184	46.8	120.6	8.9	1	790	5	5	10	15	88	295	570	645
Angina	Yes	7	150.7	206.8	78.2	10	510	10	15	20	380	510	510	510	510
Bronchitis/Emphysema	No	181	47.1	124.0	9.2	1	790	5	5	10	15	85	295	570	645
Bronchitis/Emphysema	Yes	10	113.5	142.9	45.2	5	380	5	10	58	140	368	380	380	380

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors at a Construction Site

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		143	437.1	242.1	20.2	1	1190	10	240	510	600	675	740	930	985
Gender	Male	130	461.5	232.5	20.4	1	1190	10	300	523	600	689	745	930	985
Gender	Female	13	192.8	202.8	56.2	5	630	5	60	135	165	535	630	630	630
Age (years)	-	1	510.0	-	-	510	510	510	510	510	510	510	510	510	510
Age (years)	1 to 4	2	240.0	254.6	180.0	60	420	60	60	240	420	420	420	420	420
Age (years)	12 to 17	1	10.0	-	-	10	10	10	10	10	10	10	10	10	10
Age (years)	18 to 64	133	444.5	243.0	21.1	1	1190	10	240	520	600	687	745	930	985
Age (years)	> 64	6	396.7	188.8	77.1	60	560	60	300	460	540	560	560	560	560
Race	White	125	430.9	247.4	22.1	5	1190	10	240	510	600	687	740	930	985
Race	Black	10	430.1	233.3	73.8	1	630	1	170	550	585	615	630	630	630
Race	Some Others	2	492.5	60.1	42.5	450	535	450	450	493	535	535	535	535	535
Race	Hispanic	3	501.7	170.3	98.3	305	600	305	305	600	600	600	600	600	600
Race	Refused	3	618.3	166.5	96.1	510	810	510	510	535	810	810	810	810	810
Hispanic	No	129	426.2	247.1	21.8	1	1190	10	180	510	600	665	735	930	985
Hispanic	Yes	9	496.1	166.4	55.5	240	765	240	410	505	600	765	765	765	765
Hispanic	DK	2	577.5	180.3	127.5	450	705	450	450	578	705	705	705	705	705
Hispanic	Refused	3	635.0	156.1	90.1	510	810	510	510	585	810	810	810	810	810
Employment	-	3	163.3	223.7	129.1	10	420	10	10	60	420	420	420	420	420
Employment	Full Time	127	456.8	236.2	21.0	1	1190	15	285	520	605	690	745	930	985
Employment	Part Time	6	495.8	171.4	70.0	155	600	155	510	555	600	600	600	600	600
Employment	Not Employed	7	146.6	162.8	61.5	5	430	5	6	60	300	430	430	430	430
Education	-	4	250.0	251.8	125.9	10	510	10	35	240	465	510	510	510	510
Education	< High School	12	500.8	227.0	65.5	60	930	60	375	525	593	735	930	930	930
Education	High School Graduate	68	482.2	229.0	27.8	5	1190	20	395	523	593	720	780	985	1,190
Education	< College	41	417.7	241.0	37.6	1	745	10	170	520	615	645	687	745	745
Education	College Graduate	14	372.4	247.3	66.1	15	660	15	120	440	585	643	660	660	660
Education	Post Graduate	4	92.5	137.3	68.6	5	295	5	8	35	178	295	295	295	295
Census Region	Northeast	28	481.7	238.3	45.0	5	985	6	358	533	650	695	740	985	985
Census Region	Midwest	30	344.0	231.0	42.2	5	810	10	120	342	525	638	660	810	810
Census Region	South	57	474.0	248.3	32.9	1	1190	10	410	535	615	720	765	780	1190
Census Region	West	28	417.1	226.3	42.8	15	930	60	235	500	570	630	656	930	930
Day Of Week	Weekday	121	455.1	238.5	21.7	5	1190	15	285	525	600	687	745	930	985
Day Of Week	Weekend	22	338.0	243.0	51.8	1	705	5	60	408	525	600	645	705	705
Season	Winter	34	418.5	268.4	46.0	1	1190	5	155	505	570	645	695	1190	1,190
Season	Spring	33	412.2	223.5	38.9	10	810	60	230	490	570	635	740	810	810
Season	Summer	46	477.7	221.4	32.6	10	985	60	325	515	630	705	745	985	985
Season	Fall	30	423.2	264.2	48.2	5	930	6	135	533	585	700	780	930	930
Asthma	No	137	437.2	243.5	20.8	1	1190	10	240	510	600	675	745	930	985
Asthma	Yes	6	435.7	226.0	92.2	60	690	60	354	440	630	690	690	690	690
Angina	No	139	439.1	242.3	20.6	1	1190	10	240	510	600	687	745	930	985
Angina	Yes	4	367.3	256.3	128.1	10	570	10	182	445	553	570	570	570	570
Bronchitis/Emphysema	No	140	433.3	240.0	20.3	1	1190	10	240	510	600	670	738	810	930
Bronchitis/Emphysema	Yes	3	616.3	328.7	189.8	354	985	354	354	510	985	985	985	985	985

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors at a Restaurant/Picnic

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		64	81.0	114.7	14.3	3	540	5	13	30	108	165	270	540	540
Gender	Male	31	111.8	148.9	26.7	5	540	5	20	60	150	270	540	540	540
Gender	Female	33	52.1	57.7	10.0	3	210	3	8	30	80	135	180	210	210
Age (years)	1 to 4	6	57.5	61.4	25.1	5	160	5	15	30	105	160	160	160	160
Age (years)	5 to 11	5	112.8	202.6	90.6	5	473	5	6	20	60	473	473	473	473
Age (years)	12 to 17	6	60.0	55.4	22.6	5	150	5	30	35	105	150	150	150	150
Age (years)	18 to 64	46	84.8	116.9	17.2	3	540	5	10	50	120	180	270	540	540
Age (years)	> 64	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Race	White	54	76.0	105.0	14.3	3	540	5	15	30	105	165	270	473	540
Race	Black	4	57.8	83.1	41.6	5	180	5	6	23	110	180	180	180	180
Race	Asian	1	75.0	-	-	75	75	75	75	75	75	75	75	75	75
Race	Some Others	2	97.5	31.8	22.5	75	120	75	75	98	120	120	120	120	120
Race	Hispanic	2	20.0	14.1	10.0	10	30	10	10	20	30	30	30	30	30
Race	Refused	1	540.0	-	-	540	540	540	540	540	540	540	540	540	540
Hispanic	No	60	81.8	117.5	15.2	3	540	5	13	30	108	173	372	540	540
Hispanic	Yes	4	68.8	66.6	33.3	10	160	10	20	53	118	160	160	160	160
Employment	-	17	74.7	114.2	27.7	5	473	5	15	30	105	160	473	473	473
Employment	Full Time	37	70.8	67.9	11.2	3	270	5	15	55	120	165	210	270	270
Employment	Part Time	4	42.0	32.0	16.0	3	75	3	17	45	68	75	75	75	75
Employment	Not Employed	6	187.8	272.8	111.4	5	540	5	7	18	540	540	540	540	540
Education	-	18	70.7	112.1	26.4	3	473	3	6	30	105	160	473	473	473
Education	< High School	1	540.0	-	-	540	540	540	540	540	540	540	540	540	540
Education	High School Graduate	11	56.2	84.5	25.5	3	270	3	10	20	60	165	270	270	270
Education	< College	10	108.6	164.6	52.1	5	540	5	7	30	150	353	540	540	540
Education	College Graduate	11	68.6	59.5	18.0	10	210	10	20	55	110	120	210	210	210
Education	Post Graduate	13	70.3	53.5	14.8	6	180	6	15	75	80	140	180	180	180
Census Region	Northeast	19	88.1	116.2	26.7	3	473	3	10	60	120	270	473	473	473
Census Region	Midwest	15	102.6	140.7	36.3	3	540	3	15	45	165	210	540	540	540
Census Region	South	16	48.6	47.3	11.8	5	140	5	9	30	93	120	140	140	140
Census Region	West	14	85.4	138.7	37.1	10	540	10	15	30	75	160	540	540	540
Day Of Week	Weekday	35	51.2	52.7	8.9	3	180	3	15	30	75	150	165	180	180
Day Of Week	Weekend	29	117.0	154.2	28.6	5	540	5	10	60	135	473	540	540	540
Season	Winter	8	79.4	75.2	26.6	10	210	10	20	53	135	210	210	210	210
Season	Spring	14	138.4	172.8	46.2	5	540	5	30	65	180	473	540	540	540
Season	Summer	28	71.0	105.1	19.9	3	540	3	8	35	100	150	160	540	540
Season	Fall	14	44.6	52.2	14.0	5	165	5	10	20	60	150	165	165	165
Asthma	No	61	82.1	117.2	15.0	3	540	5	10	30	110	165	270	540	540
Asthma	Yes	3	58.3	40.7	23.5	30	105	30	30	40	105	105	105	105	105
Angina	No	63	82.2	115.2	14.5	3	540	5	15	30	110	165	270	540	540
Angina	Yes	1	5.0	-	-	5	5	5	5	5	5	5	5	5	5
Bronchitis/Emphysema	No	63	81.7	115.5	14.6	3	540	5	10	30	110	165	270	540	540
Bronchitis/Emphysema	Yes	1	40.0	-	-	40	40	40	40	40	40	40	40	40	40

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors at a Farm

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		128	252.7	232.5	20.6	5	955	20	75	177	428	600	730	855	933
Gender	Male	86	305.2	251.4	27.1	5	955	29	90	230	500	660	780	933	955
Gender	Female	42	145.2	137.2	21.2	5	600	20	50	105	210	265	482	600	600
Age (years)	-	1	510.0	-	-	510	510	510	510	510	510	510	510	510	510
Age (years)	1 to 4	3	121.7	52.5	30.3	70	175	70	70	120	175	175	175	175	175
Age (years)	5 to 11	7	111.3	77.0	29.1	25	264	25	50	100	130	264	264	264	264
Age (years)	12 to 17	9	157.8	85.4	28.5	29	265	29	90	175	265	265	265	256	265
Age (years)	18 to 64	91	296.7	252.2	26.4	5	955	20	80	230	500	635	780	933	955
Age (years)	> 64	17	133.8	134.2	32.5	5	495	5	50	85	160	360	495	495	495
Race	White	120	260.2	236.2	21.6	5	955	20	75	180	473	608	745	855	933
Race	Black	4	58.8	30.9	15.5	25	85	25	33	63	85	85	85	85	85
Race	Some Others	2	165.0	21.2	15.0	150	180	150	150	165	180	180	180	180	180
Race	Hispanic	2	277.5	222.7	157.5	120	435	120	120	278	435	435	435	435	435
Hispanic	No	123	252.6	234.8	21.2	5	955	20	70	178	420	600	730	855	933
Hispanic	Yes	4	297.5	189.1	94.6	120	485	120	135	293	460	485	485	485	485
Hispanic	Refused	1	85.0	-	-	85	85	85	85	85	85	85	85	85	85
Employment	-	19	134.9	77.7	17.8	25	265	25	86	120	180	264	265	265	265
Employment	Full Time	73	314.8	258.1	30.2	5	955	20	85	240	525	660	780	933	955
Employment	Part Time	11	283.0	183.6	55.4	45	525	45	150	230	490	495	525	525	525
Employment	Not Employed	24	152.9	184.0	37.6	5	825	5	35	90	205	280	495	825	825
Employment	Refused	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Education	-	20	137.2	76.3	17.1	25	265	27	88	120	180	262	265	265	265
Education	< High School	12	305.0	211.1	60.9	30	635	30	98	325	493	510	635	635	635
Education	High School Graduate	50	314.5	280.3	39.6	5	955	20	85	215	525	745	855	944	955
Education	< College	25	186.6	166.0	33.2	5	555	15	60	155	255	482	525	555	555
Education	College Graduate	12	290.4	242.9	70.1	30	615	30	68	203	530	600	615	615	615
Education	Post Graduate	9	229.4	246.1	82.0	5	780	5	80	150	210	780	780	780	780
Census Region	Northeast	11	238.2	299.1	90.2	5	955	5	30	100	490	520	955	955	955
Census Region	Midwest	42	202.3	196.6	30.3	15	780	20	654	125	265	510	635	780	780
Census Region	South	57	279.7	239.3	31.7	5	933	25	85	195	482	635	760	825	933
Census Region	West	18	293.7	242.3	57.1	5	855	5	120	220	525	615	855	855	855
Day Of Week	Weekday	78	276.9	243.8	27.6	5	955	15	85	180	485	615	780	933	955
Day Of Week	Weekend	50	215.0	210.6	29.8	5	855	25	60	120	290	525	700	793	855
Season	Winter	32	205.3	207.7	36.7	5	955	22	78	120	245	495	540	955	955
Season	Spring	40	224.4	213.3	33.7	5	825	25	60	153	343	525	625	825	825
Season	Summer	43	276.1	247.8	37.8	5	933	20	70	230	435	660	760	933	933
Season	Fall	13	379.2	264.9	73.5	15	780	15	200	280	600	730	780	780	780
Asthma	No	120	257.0	235.2	21.5	5	955	21	75	180	428	608	745	855	933
Asthma	Yes	8	188.5	188.5	66.6	5	500	5	700	110	322	500	500	500	500
Angina	No	127	253.0	233.4	20.7	5	955	20	75	175	435	600	730	855	933
Angina	Yes	1	210.0	-	-	210	210	210	210	210	210	210	210	210	210
Bronchitis/Emphysema	No	125	256.2	233.9	20.9	5	955	22	75	178	435	600	730	855	933
Bronchitis/Emphysema	Yes	3	106.7	95.7	55.3	5	195	5	5	120	195	195	195	195	195

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

At Home in the Outdoor Pool or Spa

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		85	115.4	103.7	11.2	1	450	15	34	90	150	255	360	450	450
Gender	Male	34	113.7	106.8	18.3	5	450	10	45	75	150	258	360	450	450
Gender	Female	51	116.4	102.7	14.4	1	450	15	30	90	178	240	360	390	450
Age (years)	-	2	60.0	63.6	45.0	15	105	15	15	60	105	105	105	105	105
Age (years)	1 to 4	9	85.6	86.3	28.8	15	255	15	30	60	75	255	255	255	255
Age (years)	5 to 11	15	164.2	104.0	26.8	25	450	25	105	140	185	300	450	450	450
Age (years)	12 to 17	5	97.0	53.8	24.1	40	180	40	60	100	105	180	180	180	180
Age (years)	18 to 64	44	117.6	112.7	17.0	4	450	15	32	83	155	297	360	450	450
Age (years)	> 64	10	78.9	85.3	27.0	1	258	1	20	53	90	227	258	258	258
Race	White	75	120.9	107.7	12.4	1	450	15	34	90	180	258	360	450	450
Race	Black	5	66.0	59.7	26.7	10	150	10	20	45	105	150	150	150	150
Race	Some Others	1	105.0	-	-	105	105	105	105	105	105	105	105	105	105
Race	Hispanic	2	112.5	53.0	37.5	75	150	75	75	113	150	150	150	150	150
Race	Refused	2	37.5	31.8	22.5	15	60	15	15	38	60	60	60	60	60
Hispanic	No	78	116.8	104.6	11.8	1	450	10	34	90	160	255	360	450	450
Hispanic	Yes	5	123.0	108.4	48.5	30	300	30	60	75	150	300	300	300	300
Hispanic	Refused	2	37.5	31.8	22.5	15	60	15	15	38	60	60	60	60	60
Employment	-	29	128.2	97.0	18.0	15	450	20	60	105	178	255	300	450	450
Employment	Full Time	27	111.9	102.5	19.7	4	390	10	30	90	150	297	360	390	390
Employment	Part Time	2	237.5	300.5	212.5	25	450	25	25	238	450	450	450	450	450
Employment	Not Employed	26	99.0	94.8	18.6	1	360	5	30	68	130	240	258	360	360
Employment	Refused	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Education	-	30	124.4	97.5	17.8	15	450	15	60	105	178	250	300	450	450
Education	< High School	8	109.4	155.3	54.9	5	450	5	15	38	158	450	450	450	450
Education	High School Graduate	15	150.0	130.5	33.7	1	390	1	45	105	240	360	390	390	390
Education	< College	17	80.5	66.7	16.2	4	240	4	30	75	90	225	240	240	240
Education	College Graduate	9	120.6	107.3	35.8	15	297	15	30	85	180	297	297	297	297
Education	Post Graduate	6	81.7	42.0	17.2	30	135	30	60	68	130	135	135	135	135
Census Region	Northeast	23	135.3	113.5	23.7	1	450	10	40	100	225	245	297	450	450
Census Region	Midwest	16	64.6	63.6	15.9	4	255	4	25	53	83	135	255	255	255
Census Region	South	23	114.7	78.5	16.4	15	390	20	60	105	150	185	210	390	390
Census Region	West	23	131.2	129.3	27.0	15	450	25	30	75	195	360	360	450	450
Day Of Week	Weekday	56	114.5	106.7	14.3	1	450	5	30	90	155	255	390	450	450
Day Of Week	Weekend	29	117.0	99.5	18.5	10	360	20	45	85	150	297	360	360	360
Season	Winter	10	118.9	159.4	50.4	4	450	4	20	30	135	405	450	450	450
Season	Spring	24	97.4	74.6	15.2	10	360	30	53	80	120	180	195	360	360
Season	Summer	47	124.5	104.3	15.2	1	450	15	40	90	185	255	300	450	450
Season	Fall	4	105.8	107.5	53.7	30	258	30	30	68	182	258	258	258	258
Asthma	No	73	109.9	105.5	12.3	1	450	10	30	75	140	255	360	450	450
Asthma	Yes	11	160.5	82.4	24.8	85	360	85	90	150	225	225	360	360	360
Asthma	DK	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Angina	No	84	116.5	103.7	11.3	1	450	15	37	90	155	255	360	450	450
Angina	DK	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Bronchitis/Emphysema	No	78	115.7	101.8	11.5	1	450	10	40	90	150	255	360	450	450
Bronchitis/Emphysema	Yes	6	126.7	137.8	56.3	15	360	15	25	68	225	360	360	360	360
Bronchitis/Emphysema	DK	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Waiting on a Bus, Train, etc. Stop

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		151	18.7	18.8	1.5	1	128	4	7	15	20	40	45	67	120
Gender	Male	61	16.3	18.0	2.3	1	120	4	5	11	20	30	45	65	120
Gender	Female	90	20.3	19.2	2.0	1	128	4	10	15	30	43	60	75	128
Age (years)	-	2	21.0	5.7	4.0	17	25	17	17	21	25	25	25	25	25
Age (years)	1 to 4	2	8.0	9.9	7.0	1	15	1	1	8	15	15	15	15	15
Age (years)	5 to 11	32	12.5	10.7	1.9	2	45	2	5	10	15	20	43	45	45
Age (years)	12 to 17	50	13.8	11.5	1.6	1	74	3	5	10	20	23	30	53	75
Age (years)	18 to 64	54	25.5	25.6	3.5	1	128	5	10	15	30	60	67	120	128
Age (years)	> 64	11	27.3	13.5	4.1	5	45	5	20	30	40	45	45	45	45
Race	White	115	18.3	18.0	1.7	1	128	4	5	15	22	40	45	67	75
Race	Black	21	17.5	12.0	2.6	1	45	3	10	15	23	35	40	45	45
Race	Asian	3	10.0	5.0	2.9	5	15	5	5	10	15	15	15	15	15
Race	Some Others	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Race	Hispanic	10	29.8	35.8	11.3	5	120	5	10	17	20	93	120	120	120
Race	Refused	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Hispanic	No	136	18.1	17.1	1.5	1	128	4	6	15	23	40	45	67	75
Hispanic	Yes	13	25.2	32.4	9.0	1	120	1	10	15	20	65	120	120	120
Hispanic	DK	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Hispanic	Refused	1	15.0	-	-	15	15	15	15	15	15	15	15	15	15
Employment	-	79	13.2	11.4	1.3	1	75	2	5	10	15	23	35	45	75
Employment	Full Time	31	24.9	24.8	4.5	1	128	5	10	15	30	45	65	128	128
Employment	Part Time	15	31.7	31.5	8.1	5	120	5	10	17	45	67	120	120	120
Employment	Not Employed	26	20.6	12.7	2.5	5	45	5	10	20	30	40	45	45	45
Education	-	87	12.9	11.0	1.2	1	75	3	5	10	15	23	30	45	75
Education	< High School	6	32.5	11.7	4.8	15	45	15	25	33	45	45	45	45	45
Education	High School Graduate	25	23.6	24.6	4.9	5	120	5	10	15	30	45	67	120	120
Education	< College	9	28.3	19.2	6.4	10	60	10	10	20	45	60	60	60	60
Education	College Graduate	16	33.8	31.1	7.8	5	128	5	10	30	38	65	128	128	128
Education	Post Graduate	8	14.9	8.4	3.0	1	30	1	41	15	19	30	30	30	30
Census Region	Northeast	63	20.5	23.4	3.0	1	128	3	6	15	22	40	65	120	128
Census Region	Midwest	27	17.5	13.1	2.5	3	60	4	5	15	20	35	35	60	60
Census Region	South	39	19.8	16.7	2.7	4	75	5	10	15	28	45	65	75	75
Census Region	West	22	13.2	11.3	2.4	1	45	1	5	10	15	30	30	45	45
Day Of Week	Weekday	128	17.8	19.0	1.7	1	128	3	6	15	20	35	45	75	120
Day Of Week	Weekend	23	23.8	17.0	3.5	5	65	5	10	20	35	45	60	65	65
Season	Winter	55	19.9	15.6	2.1	1	75	2	10	15	25	43	60	65	75
Season	Spring	43	17.2	20.7	3.2	1	120	4	5	10	20	33	45	120	120
Season	Summer	28	24.0	25.5	4.8	5	128	5	10	15	33	45	67	128	128
Season	Fall	25	12.7	9.9	2.0	1	45	4	5	10	15	20	35	45	45
Asthma	No	139	18.8	18.8	1.6	1	128	3	10	15	20	40	45	75	120
Asthma	Yes	10	20.0	20.5	6.5	4	65	4	5	12	30	55	65	65	65
Asthma	DK	2	7.5	3.5	2.5	5	10	5	5	8	10	10	10	10	10
Angina	No	151	18.7	18.8	1.5	1	128	4	7	15	20	40	45	67	120
Bronchitis/Emphysema	No	145	18.7	19.0	1.6	1	128	4	6	15	20	40	45	75	120
Bronchitis/Emphysema	Yes	6	19.8	13.6	5.5	9	45	9	10	16	23	45	45	45	45

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors Near a Vehicle

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		2825	79.9	143.8	2.7	1	1440	2	10	30	65	200	465	600	675
Gender	Male	1388	111.2	185.0	5.0	1	1440	3	11	31	90	430	570	675	735
Gender	Female	1436	49.5	75.9	2.0	1	790	2	10	25	60	120	180	290	420
Gender	Refused	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Age (years)	-	51	64.4	90.9	12.7	1	510	4	20	40	65	125	290	360	510
Age (years)	1 to 4	102	46.0	59.5	5.9	1	420	2	10	30	60	105	160	192	245
Age (years)	5 to 11	230	55.9	86.5	5.7	1	540	2	10	20	60	170	215	360	465
Age (years)	12 to 17	313	40.9	55.7	3.1	1	435	3	10	21	45	100	160	220	260
Age (years)	18 to 64	1787	96.4	169.1	4.0	1	1440	2	10	30	75	325	539	645	720
Age (years)	> 64	342	57.6	85.3	4.6	1	560	4	10	30	60	120	205	450	510
Race	White	2275	81.8	148.4	3.1	1	1440	2	10	30	68	210	480	600	695
Race	Black	278	78.4	130.7	7.8	1	645	2	10	30	70	190	435	580	600
Race	Asian	51	42.4	61.7	8.6	1	405	2	10	28	60	85	120	150	405
Race	Some Others	50	73.1	113.0	16.0	1	535	2	15	40	60	168	420	493	535
Race	Hispanic	136	55.1	100.2	8.6	1	600	2	10	25	55	110	170	525	600
Race	Refused	35	124.4	186.9	31.6	4	810	10	20	40	120	360	565	810	810
Hispanic	No	2552	79.8	143.0	2.8	1	1440	2	10	30	65	200	457	600	665
Hispanic	Yes	230	68.1	126.0	8.3	1	765	2	10	30	60	148	410	565	615
Hispanic	DK	13	185.3	321.3	89.1	2	985	2	10	25	100	705	985	985	985
Hispanic	Refused	30	129.8	198.3	36.2	10	810	10	20	40	98	435	585	810	810
Employment	-	632	47.0	68.8	2.7	1	540	2	10	23	55	120	180	265	360
Employment	Full Time	1169	114.9	193.0	5.6	1	1440	2	10	30	90	485	570	690	740
Employment	Part Time	254	67.1	114.3	7.2	1	795	2	10	30	63	165	280	510	600
Employment	Not Employed	751	56.8	84.9	3.1	1	690	2	10	30	60	130	210	360	465
Employment	Refused	19	96.9	185.8	42.6	5	790	5	20	30	90	360	790	790	790
Education	-	702	47.1	70.2	2.6	1	540	2	10	24	55	120	180	265	360
Education	< High School	222	105.8	193.7	13.0	1	1440	4	10	30	90	365	540	720	735
Education	High School Graduate	702	113.2	185.8	7.0	1	1410	2	10	35	90	455	555	665	740
Education	< College	537	87.9	157.3	6.8	1	985	2	10	30	70	240	540	635	705
Education	College Graduate	367	70.9	117.9	6.2	1	660	2	10	30	68	170	325	565	600
Education	Post Graduate	295	55.2	86.9	5.1	1	710	3	10	30	60	120	200	362	560
Census Region	Northeast	749	75.7	130.6	4.8	1	985	3	10	30	70	179	375	570	665
Census Region	Midwest	586	77.4	141.2	5.8	1	1440	2	10	30	60	210	390	560	645
Census Region	South	836	86.4	160.3	5.5	1	1410	2	10	30	62	240	525	643	710
Census Region	West	654	78.2	138.3	5.4	1	985	2	10	30	65	180	435	570	615
Day Of Week	Weekday	2018	84.2	155.6	3.5	1	1440	2	10	30	65	215	515	625	705
Day Of Week	Weekend	807	68.8	108.2	3.8	1	705	2	10	30	65	180	310	465	540
Season	Winter	703	70.9	141.8	5.3	1	1440	2	10	26	60	160	365	570	643
Season	Spring	791	80.5	135.5	4.8	1	810	2	10	30	74	215	435	570	645
Season	Summer	819	84.2	150.3	5.3	1	985	2	10	30	70	210	510	615	705
Season	Fall	512	84.0	148.3	6.6	1	930	2	10	30	70	225	510	600	690
Asthma	No	2596	80.4	143.2	2.8	1	1410	2	10	30	65	205	475	600	675
Asthma	Yes	205	75.1	157.2	11.0	1	1440	2	10	30	65	160	309	580	690
Asthma	DK	24	62.1	78.5	16.0	5	360	5	18	35	68	98	225	360	360
Angina	No	2726	79.6	144.3	2.8	1	1440	2	10	30	65	196	465	600	687
Angina	Yes	76	92.4	139.4	16.0	1	570	3	10	35	91	354	465	535	570
Angina	DK	23	68.7	91.2	19.0	5	360	10	20	40	75	98	330	360	360
Bronchitis/Emphysema	No	2684	79.4	142.8	2.8	1	1440	2	10	30	65	197	465	600	665
Bronchitis/Emphysema	Yes	115	93.8	175.4	16.4	1	985	2	10	30	90	225	465	735	985
Bronchitis/Emphysema	DK	26	61.6	72.2	14.2	5	360	7	27	40	75	110	180	360	360

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Outdoors Other Than Near a Residence or Vehicle Such as Parks, Golf Courses, or Farms

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1383	200.2	202.7	5.5	1	1440	10	60	130	276	510	600	748	915
Gender	Male	789	223.5	208.7	7.4	1	1440	20	60	150	315	540	635	765	900
Gender	Female	593	168.7	190.0	7.8	1	1440	10	40	105	238	420	540	700	930
Gender	Refused	1	420.0	-	-	420	420	420	420	420	420	420	420	420	420
Age (years)	-	19	183.4	160.4	36.8	10	540	10	60	140	220	510	540	540	540
Age (years)	1 to 4	54	164.6	177.3	24.1	1	980	10	60	120	175	370	560	630	980
Age (years)	5 to 11	159	171.3	177.9	14.1	5	1210	15	55	115	221	405	574	660	725
Age (years)	12 to 17	175	156.9	174.4	13.2	5	1065	10	45	100	210	385	570	735	915
Age (years)	18 to 64	858	219.4	215.1	7.3	1	1440	10	60	150	310	540	635	780	933
Age (years)	> 64	118	181.9	180.2	16.6	5	900	20	55	113	280	480	570	600	735
Race	White	1186	202.6	203.4	5.9	1	1440	14	60	135	280	510	615	750	930
Race	Black	81	185.8	195.1	21.7	1	765	5	40	108	240	540	585	690	765
Race	Asian	20	169.5	189.1	42.3	10	665	10	33	95	230	478	585	665	665
Race	Some Others	30	187.5	161.8	29.5	10	560	10	60	120	270	438	535	560	560
Race	Hispanic	57	158.3	203.3	26.9	1	1305	5	30	110	228	370	435	555	1305
Race	Refused	9	380.0	250.6	83.5	30	810	30	195	435	540	810	810	810	810
Hispanic	No	1267	202.6	203.4	5.7	1	1440	10	60	130	280	510	615	748	915
Hispanic	Yes	103	163.9	185.2	18.2	1	1305	10	30	115	228	400	511	555	555
Hispanic	DK	4	67.5	59.2	29.6	10	145	10	23	58	113	145	145	145	145
Hispanic	Refused	9	330.0	259.5	86.5	30	810	30	140	210	510	810	810	810	810
Employment	-	383	163.8	176.8	9.0	1	1210	10	51	110	215	385	560	665	915
Employment	Full Time	555	228.5	219.4	9.3	1	1305	14	60	150	335	545	645	825	955
Employment	Part Time	126	202.6	211.7	18.9	3	1440	10	60	125	280	510	580	690	700
Employment	Not Employed	309	191.5	189.3	10.8	1	1440	10	50	125	275	480	565	690	735
Employment	Refused	10	254.0	240.9	76.2	30	810	30	105	168	280	675	810	810	810
Education	-	429	163.9	175.5	8.5	1	1210	10	55	115	210	385	560	665	840
Education	< High School	83	264.5	255.5	28.0	1	1305	30	60	180	480	555	600	1100	1305
Education	High School Graduate	313	228.6	228.2	12.9	3	1440	10	60	160	310	570	690	855	990
Education	< College	250	218.0	203.0	12.8	1	1440	10	60	153	330	510	555	715	765
Education	College Graduate	185	207.3	190.2	14.0	1	930	20	60	128	285	505	600	690	795
Education	Post Graduate	123	163.6	173.0	15.6	1	900	10	45	90	240	385	480	735	780
Census Region	Northeast	279	196.8	208.4	12.5	1	1305	10	60	130	265	480	590	900	1130
Census Region	Midwest	309	196.7	211.6	12.0	1	1440	10	50	120	270	510	635	740	900
Census Region	South	468	198.4	195.1	9.0	1	933	15	60	120	285	510	600	748	825
Census Region	West	327	208.7	200.5	11.1	1	1440	15	60	150	285	525	580	725	855
Day Of Week	Weekday	851	184.0	197.9	6.8	1	1440	10	45	119	240	490	585	735	900
Day Of Week	Weekend	532	226.0	207.6	9.0	1	1440	20	69	155	320	525	630	810	915
Season	Winter	241	175.7	192.7	12.4	1	1065	10	35	93	253	450	585	750	810
Season	Spring	412	185.8	174.5	8.6	5	980	15	60	130	240	473	555	665	740
Season	Summer	508	225.0	220.7	9.8	1	1440	15	60	150	305	540	630	840	990
Season	Fall	222	196.5	213.6	14.3	1	1130	10	35	120	280	540	600	780	900
Asthma	No	1283	196.6	196.9	5.5	1	1440	10	60	125	270	495	600	730	855
Asthma	Yes	93	244.3	263.3	27.3	5	1440	15	60	150	350	530	810	1100	1440
Asthma	DK	7	270.7	274.4	103.7	30	810	30	60	195	450	810	810	810	810
Angina	No	1352	199.0	202.3	5.5	1	1440	10	60	130	270	510	600	740	915
Angina	Yes	25	238.6	206.0	41.2	1	730	5	60	210	340	465	690	730	730
Angina	DK	6	290.8	276.0	112.7	30	810	30	140	203	360	810	810	810	810
Bronchitis/Emphysema	No	1326	199.8	200.8	5.5	1	1440	10	60	130	275	500	600	735	900
Bronchitis/Emphysema	Yes	51	206.4	239.8	33.6	5	1100	10	50	110	305	540	700	930	1100
Bronchitis/Emphysema	DK	6	233.3	294.0	120.0	15	810	15	30	168	210	810	810	810	810

Table 16-20. Time Spent (minutes/day) in Selected Outdoor Locations, Doers Only (continued)

Cumulative Outdoors (outside the residence)

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		3,124	154.0	158.3	2.8	1	1,290	5	40	105	210	362	480	610	715
Sex	Male	1,533	174.9	173.7	4.4	1	1,290	10	60	120	240	420	540	680	745
Sex	Female	1,588	133.5	138.8	3.5	1	1,065	5	30	90	190	325	415	525	610
Sex	Refused	3	340.0	140.0	80.8	240	500	240	240	280	500	500	500	500	500
Age (years)	-	40	164.0	179.6	28.4	2	720	4	40	108	213	430	600	720	720
Age (years)	1 to 4	201	195.7	163.7	11.5	3	715	30	75	135	270	430	535	625	699
Age (years)	5 to 11	353	187.6	158.6	8.4	4	1,250	20	80	150	265	365	479	600	720
Age (years)	12 to 17	219	135.3	137.0	9.3	1	720	5	35	100	190	300	452	545	610
Age (years)	18 to 64	1,809	144.2	155.1	3.6	1	1,080	5	30	90	199	360	470	600	715
Age (years)	>64	502	156.4	168.3	7.5	1	1,290	5	36	110	210	375	485	645	735
Race	White	2,622	156.8	160.2	3.1	1	1,290	5	45	105	215	375	485	625	720
Race	Black	255	141.6	153.2	9.6	1	1,250	5	30	95	195	330	420	535	645
Race	Asian	34	115.8	135.6	23.2	1	480	5	20	60	150	360	450	480	480
Race	Some Others	53	167.0	149.0	20.5	3	750	5	60	130	238	320	475	553	750
Race	Hispanic	125	117.3	128.9	11.5	1	720	5	30	70	150	270	355	590	610
Race	Refused	35	187.1	163.8	27.7	5	600	5	60	170	240	450	510	600	600
Hispanic	No	2,857	153.8	158.4	3.0	1	1,290	5	40	105	210	362	480	610	720
Hispanic	Yes	222	146.4	154.1	10.3	1	750	5	30	113	200	345	480	640	690
Hispanic	DK	15	191.5	178.3	46.0	15	585	15	40	140	380	420	585	585	585
Hispanic	Refused	30	212.5	165.3	30.2	5	600	5	60	180	345	458	510	600	600
Employment	-	774	175.8	156.1	5.6	1	1,250	15	60	125	245	380	480	610	705
Employment	Full Time	1,110	141.3	159.9	4.8	1	1,080	5	30	85	195	359	490	660	745
Employment	Part Time	240	134.7	140.8	9.1	1	1,080	5	30	90	183	333	423	485	525
Employment	Not Employed	978	156.1	159.2	5.1	1	1,290	5	40	115	220	375	480	610	701
Employment	Refused	22	152.7	209.8	44.7	5	660	5	15	60	125	555	600	660	660
Education	-	825	174.1	156.2	5.4	1	1,250	15	60	125	240	380	480	610	699
Education	< High School	306	171.9	188.4	10.8	1	1,290	7	45	120	240	405	510	765	855
Education	High School Graduate	837	153.6	154.8	5.4	1	840	5	35	105	215	380	480	598	701
Education	< College	527	143.4	157.1	6.8	1	1,080	5	30	90	195	360	465	615	720
Education	College Graduate	355	126.9	142.6	7.6	1	750	5	30	80	170	300	415	615	690
Education	Post Graduate	274	130.5	151.0	9.1	1	1,065	5	30	75	180	325	465	570	660
Census Region	Northeast	635	148.0	143.7	5.7	1	750	5	35	105	215	345	450	575	610
Census Region	Midwest	639	156.0	169.2	6.7	1	1,290	5	45	102	210	360	500	655	750
Census Region	South	1,120	158.6	165.2	4.9	1	1,080	5	40	110	210	390	495	640	745
Census Region	West	730	150.6	149.6	5.5	1	855	5	36	105	213	360	465	575	660
Day Of Week	Weekday	1,933	141.2	149.0	3.4	1	1,250	5	31	90	190	345	452	598	698
Day Of Week	Weekend	1,191	174.9	170.4	4.9	1	1,290	10	50	120	260	400	500	660	745
Season	Winter	548	114.0	138.1	5.9	1	1,080	5	25	60	150	280	380	540	690
Season	Spring	1,034	171.9	159.4	5.0	1	990	10	60	120	240	390	495	645	730
Season	Summer	1,098	168.3	168.2	5.1	1	1,290	5	50	120	235	400	510	630	715
Season	Fall	444	126.5	140.7	6.7	1	960	5	30	75	163	313	420	575	655
Asthma	No	2,869	154.5	159.2	3.0	1	1,290	5	40	105	210	365	480	615	720
Asthma	Yes	236	145.8	145.5	9.5	1	885	5	45	105	190	360	450	575	610
Asthma	DK	19	182.4	181.0	41.5	1	600	1	60	120	300	480	600	600	600
Angina	No	3,023	153.2	156.3	2.8	1	1,290	5	40	105	210	360	479	610	707
Angina	Yes	76	172.9	222.3	25.5	2	1,080	5	30	69	253	465	660	1,065	1,080
Angina	DK	25	195.0	170.4	34.1	5	600	5	60	150	300	465	480	600	600
Bronchitis/Emphysema	No	2,968	154.9	158.8	2.9	1	1,290	5	40	105	210	367	480	615	715
Bronchitis/Emphysema	Yes	139	129.4	142.5	12.1	1	855	5	30	75	175	327	415	553	735
Bronchitis/Emphysema	DK	17	206.8	179.8	43.6	5	600	5	60	170	300	480	600	600	600

\- = Indicates missing data.
DK = The respondent replied “don’t know”.
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-21. Mean Time Spent (minutes/day) Inside and Outside, by Age Category, Children <21 years

Age (years)	*N*	Average Indoor Minutes[a]	Average Outdoor Minutes[b]	Average Unclassified Minutes[c]
Birth to <1	25	1,353	44	43
1 to <2	90	1,353	36	51
2 to <3	131	1,316	76	48
3 to <6	360	1,278	107	54
6 to <11	511	1,244	132	64
11 to <16	449	1,260	100	80
16 to <21	493	1,248	102	90

[a] Time indoors was estimating by adding the average times spent indoors at the respondents' home (kitchen, living room, bathroom, etc.), at other houses, and inside other locations such as school, restaurants, etc.

[b] Time outdoors was estimated by adding the average time spent outdoors at the respondents' pool and yard, others' pool and yard, and outside other locations such as sidewalk, street, neighborhood, parking lot, service station/gas station, school grounds, park/golf course, pool, river, lake, farm, etc.

[c] Includes time spent in vehicles or in activities that could not be assigned an indoor or outdoor location.

N = Sample size.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-22. Mean Time Spent (minutes/day) Outside and Inside, Adults 18 Years and Older, Doers Only

Time Outdoors

Age (years)	Time Outdoors away from Residence[a]		Time Outdoors at Residence[a]		Total Time Outdoors[b]	
	Mean	95th Percentile	Mean	95th Percentile	Mean	95th Percentile
18 to 64	144.2	470	136.4	435	281	-
>64	156.5	485	141.1	465	298	-

Time Indoors

Age (years)	Total Minutes/24 hours	Total Time Outdoors	Total Time Indoors[c]
		Mean	Mean
18 to 64	1,440	281	1,159
>64	1,440	298	1,142

[a] For additional statistics see Table 16-26.

[b] Total Time Outdoors was calculated by summing the time spent outdoors away from the residence and the time outdoors at the residence.

Source: U.S. EPA (1996).

Table 16-23. Time Spent (minutes/day) in Selected Vehicles and All Vehicles Combined Whole Population and Doers Only, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Car—Whole Population															
Birth to <1	63	36	0	0	0	0	0	0	10	49	107	171	208	220	235
1 to <2	118	41	0	0	0	0	0	0	20	60	98	151	246	336	390
2 to <3	118	33	0	0	0	0	0	0	20	50	90	126	163	187	215
3 to <6	357	43	0	0	0	0	0	0	20	60	117	155	221	272	620
6 to <11	497	37	0	0	0	0	0	0	15	55	102	146	185	212	630
11 to <16	466	39	0	0	0	0	0	0	15	55	99	150	254	302	900
16 to <21	481	61	0	0	0	0	0	8	40	90	155	195	249	321	380
Car—Doers Only															
Birth to <1	35	65	2	5	7	10	14	20	40	73	159	203	218	227	235
1 to <2	68	72	5	8	10	10	15	30	58	85	147	186	323	363	390
2 to <3	73	54	4	4	4	8	10	24	42	65	118	141	181	197	215
3 to <6	227	67	4	4	5	7	10	25	45	88	150	180	267	327	620
6 to <11	317	58	1	2	2	5	10	20	40	82	127	163	202	300	630
11 to <16	286	64	1	3	5	5	10	20	40	75	122	193	279	338	900
16 to <21	364	81	2	9	10	10	17	30	60	105	180	210	275	334	380
Truck (Pickup or Van)—Whole Population															
Birth to <1	63	2	0	0	0	0	0	0	0	0	0	0	0	42	110
1 to <2	118	2	0	0	0	0	0	0	0	0	0	0	52	81	90
2 to <3	118	14	0	0	0	0	0	0	0	0	14	31	124	201	955
3 to <6	357	5	0	0	0	0	0	0	0	0	0	30	60	114	245
6 to <11	497	7	0	0	0	0	0	0	0	0	15	45	95	110	240
11 to <16	466	9	0	0	0	0	0	0	0	0	15	59	153	181	352
16 to <21	481	11	0	0	0	0	0	0	0	0	25	90	150	190	445
Truck (Pickup or Van)—Doers Only															
Birth to <1	1	-	110	-	-	-	-	-	-	-	-	-	-	-	110
1 to <2	5	-	20	-	-	-	-	-	-	-	-	-	-	-	90
2 to <3	15	109	10	10	10	10	11	15	30	53	188	434	746	851	955
3 to <6	34	53	1	2	4	8	10	16	30	59	117	207	222	233	245
6 to <11	69	48	1	4	6	10	10	15	30	65	110	124	151	186	240
11 to <16	62	67	5	5	5	5	7	15	35	89	180	185	258	299	352
16 to <21	70	78	5	5	5	10	11	22	54	115	170	213	238	304	445
Bus—Whole Population															
Birth to <1	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	1	0	0	0	0	0	0	0	0	0	0	0	25	120
3 to <6	357	2	0	0	0	0	0	0	0	0	0	0	30	47	80
6 to <11	497	11	0	0	0	0	0	0	0	0	50	70	90	110	140
11 to <16	466	16	0	0	0	0	0	0	0	15	60	89	119	148	370
16 to <21	481	6	0	0	0	0	0	0	0	0	0	45	108	135	225
Bus—Doers Only															
Birth to <1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	2	-	30	-	-	-	-	-	-	-	-	-	-	-	120
3 to <6	14	40	15	16	16	18	21	30	33	49	67	74	77	79	80
6 to <11	115	49	5	5	6	14	17	25	43	67	90	107	120	122	140
11 to <16	130	58	7	10	10	10	15	30	54	71	101	131	159	175	370
16 to <21	41	75	10	12	14	20	25	30	60	100	135	175	193	209	225

Table 16-23. Time Spent (minutes/day) in Selected Vehicles and All Vehicles Combined Whole Population and Doers Only, Children <21 Years (continued)

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
All Vehicles—Whole Population															
Birth to <1	63	39	0	0	0	0	0	0	20	60	113	171	208	220	235
1 to <2	118	44	0	0	0	0	0	0	28	60	98	151	246	336	390
2 to <3	118	50	0	0	0	0	0	0	30	60	120	151	203	214	955
3 to <6	357	50	0	0	0	0	0	0	30	65	122	167	238	272	620
6 to <11	497	57	0	0	0	0	0	15	40	85	124	155	212	289	630
11 to <16	466	67	0	0	0	0	0	15	45	85	155	206	291	383	900
16 to <21	481	84	0	0	0	0	0	25	62	120	180	239	328	382	675
All Vehicles—Doers Only															
Birth to <1	37	66	2	5	8	10	16	20	46	75	151	202	217	226	235
1 to <2	72	72	5	9	10	10	20	30	60	85	143	178	316	362	390
2 to <3	86	69	4	4	5	10	10	26	45	83	128	166	212	326	955
3 to <6	261	68	1	4	6	10	13	30	46	85	150	190	261	309	620
6 to <11	417	68	1	2	4	10	14	25	55	90	130	161	240	306	630
11 to <16	383	82	1	5	5	10	16	30	60	99	177	235	314	392	900
16 to <21	428	94	5	8	10	15	20	40	75	120	190	240	345	386	675

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-24. Time Spent (minutes/day) in Selected Vehicles, Other Mass Transit, and All Vehicles Combined, Doers Only

Car

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		6,560	87.4	88.2	1.1	1	1,280	10	34	63	110	175	240	345	450
Sex	Male	2,852	90.7	97.3	1.8	1	1,280	10	30	63	115	185	254	360	526
Sex	Female	3,706	84.9	80.4	1.3	1	878	10	35	64	110	165	220	335	420
Sex	Refused	2	30.0	14.1	10.0	20	40	20	20	30	40	40	40	40	40
Age (years)	-	120	94.0	90.2	8.2	7	593	10	38	72	120	180	223	435	450
Age (years)	1 to 4	297	63.0	56.8	3.3	2	390	10	25	45	80	135	180	235	270
Age (years)	5 to 11	449	64.6	81.1	3.8	1	900	5	20	40	85	145	175	310	345
Age (years)	12 to 17	393	64.8	71.0	3.6	1	630	9	20	41	80	136	185	300	380
Age (years)	18 to 64	4,489	93.8	92.3	1.4	1	1,280	13	40	70	120	184	250	360	495
Age (years)	>64	812	83.5	79.4	2.8	4	780	10	30	60	110	165	225	315	405
Race	White	5,337	87.6	89.7	1.2	1	1,280	10	31	64	110	175	240	360	460
Race	Black	640	86.8	74.3	2.9	1	690	10	35	65	115	180	240	305	330
Race	Asian	117	78.8	66.3	6.1	5	360	20	35	60	95	135	225	320	330
Race	Some Others	121	87.7	84.5	7.7	3	540	10	30	60	120	180	250	330	345
Race	Hispanic	265	90.1	101.5	6.2	2	825	15	35	65	100	165	235	465	620
Race	Refused	80	82.4	73.3	8.2	5	420	12	30	60	120	168	230	315	420
Hispanic	No	5,987	87.5	87.6	1.1	1	1,280	10	35	65	110	175	240	345	440
Hispanic	Yes	477	88.5	97.2	4.5	2	825	10	30	60	103	180	240	388	595
Hispanic	DK	29	63.9	73.1	13.6	5	325	6	20	40	60	187	200	325	325
Hispanic	Refused	67	86.1	78.4	9.6	5	420	14	30	60	120	180	239	315	420
Employment	-	1,124	64.2	72.3	2.2	1	900	5	20	45	81	136	180	270	345
Employment	Full Time	3,134	93.6	92.2	1.6	2	1,280	15	40	70	120	180	242	360	490
Employment	Part Time	632	90.1	82.0	3.3	2	878	10	40	70	117	175	230	330	384
Employment	Not Employed	1,629	90.4	90.2	2.2	1	780	10	35	60	115	195	250	365	465
Employment	Refused	41	97.2	84.0	13.1	10	330	15	30	75	120	220	290	330	330
Education	-	1,260	66.5	72.3	2.0	1	900	6	21	45	85	145	187	270	350
Education	< High School	434	86.0	82.1	3.9	5	620	10	35	60	115	165	210	360	455
Education	High School Graduate	1,805	91.8	91.1	2.1	1	870	10	38	65	115	190	255	385	465
Education	< College	1,335	93.2	94.3	2.6	2	1,280	10	36	70	120	180	250	380	460
Education	College Graduate	992	95.7	95.5	3.0	4	840	14	40	73	120	185	250	370	580
Education	Post Graduate	734	91.5	82.0	3.0	4	905	20	40	75	115	175	235	330	380
Census Region	Northeast	1,412	85.8	83.8	2.2	1	780	10	33	60	110	170	240	330	410
Census Region	Midwest	1,492	89.1	86.6	2.2	4	825	10	35	65	113	180	250	360	465
Census Region	South	2,251	88.3	89.3	1.9	1	900	10	34	65	115	175	235	338	490
Census Region	West	1,405	85.9	92.2	2.5	2	1,280	10	30	60	110	175	235	345	435
Day Of Week	Weekday	4,427	83.9	85.0	1.3	1	905	10	30	60	105	165	225	330	440
Day Of Week	Weekend	2,133	94.7	94.0	2.0	1	1,280	10	35	70	120	190	265	360	455
Season	Winter	1,703	83.5	82.1	2.0	1	870	10	30	60	105	165	230	350	425
Season	Spring	1,735	88.6	91.5	2.2	1	905	10	30	60	110	180	250	380	480
Season	Summer	1,767	88.0	86.5	2.1	1	900	10	35	65	115	170	235	330	450
Season	Fall	1,355	90.1	93.2	2.5	1	1,280	10	35	70	115	170	240	335	545
Asthma	No	6,063	87.4	88.0	1.1	1	1,280	10	34	63	110	175	240	350	450
Asthma	Yes	463	88.2	92.1	4.3	4	870	15	34	64	110	165	245	345	505
Asthma	DK	34	78.4	57.4	9.8	10	239	10	30	71	100	160	220	239	239
Angina	No	6,368	87.5	88.7	1.1	1	1,280	10	34	64	110	175	240	350	450
Angina	Yes	154	82.2	68.6	5.5	8	365	10	30	60	115	162	214	285	320
Angina	DK	38	89.6	72.9	11.8	10	360	10	35	74	120	180	239	360	360
Bronchitis/Emphysema	No	6,224	87.6	88.9	1.1	1	1,280	10	34	62	110	175	240	350	450
Bronchitis/Emphysema	Yes	300	85.6	76.2	4.4	1	505	10	35	69	109	185	238	305	435
Bronchitis/Emphysema	DK	36	81.1	63.1	10.5	5	239	10	30	71	120	175	220	239	239

Table 16-24. Time Spent (minutes/day) in Selected Vehicles, Other Mass Transit, and All Vehicles Combined, Doers Only (continued)

Truck (Pick-up/Van)																
								Percentiles								
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1,172	85.3	95.9	2.8	1	955	10	30	60	110	180	240	395	478
Sex	Male	760	91.1	105.4	3.8	1	955	10	30	60	115	190	265	450	620
Sex	Female	412	74.6	74.2	3.7	1	510	10	25	55	95	165	220	300	355
Age (years)	-	13	110.8	129.2	35.8	10	450	10	35	60	90	300	450	450	450
Age (years)	1 to 4	41	80.8	154.3	24.1	1	955	10	15	35	70	206	210	955	955
Age (years)	5 to 11	89	47.6	44.2	4.7	1	240	7	15	30	65	110	130	180	240
Age (years)	12 to 17	80	66.8	71.1	7.9	5	352	6	15	37	94	180	223	265	352
Age (years)	18 to 64	859	91.4	98.0	3.3	2	750	10	30	60	115	189	260	440	555
Age (years)	>64	90	79.0	82.4	8.7	10	453	12	30	49	105	185	265	390	453
Race	White	1,022	84.7	96.2	3.0	1	955	10	30	60	110	180	235	390	510
Race	Black	68	91.3	98.5	11.9	6	453	14	28	63	106	220	295	450	453
Race	Asian	3	138.3	63.3	36.6	90	210	90	90	115	210	210	210	210	210
Race	Some Others	20	67.2	48.5	10.8	5	165	8	25	63	103	137	155	165	165
Race	Hispanic	48	92.8	99.3	14.3	5	440	10	28	60	120	224	330	440	440
Race	Refused	11	88.2	110.8	33.4	10	390	10	30	60	65	190	390	390	390
Hispanic	No	1,069	85.1	95.6	2.9	1	955	10	30	60	110	180	240	390	478
Hispanic	Yes	87	89.1	100.8	10.8	5	630	5	29	60	115	210	230	440	630
Hispanic	DK	5	58.0	36.2	16.2	20	97	20	20	68	85	97	97	97	97
Hispanic	Refused	11	85.9	111.6	33.7	10	390	10	30	35	65	190	390	390	390
Employment	-	205	60.2	86.4	6.0	1	955	7	15	30	75	146	185	240	265
Employment	Full Time	642	93.3	101.4	4.0	4	750	10	30	60	120	192	270	450	555
Employment	Part Time	97	89.4	89.0	9.0	2	460	6	30	60	120	190	270	450	460
Employment	Not Employed	217	83.0	85.8	5.8	5	655	10	30	60	110	180	235	300	355
Employment	Refused	11	96.4	114.3	34.5	10	390	10	30	35	170	190	390	390	390
Education	-	230	64.0	86.9	5.7	1	955	7	15	35	85	160	206	245	352
Education	< High School	119	90.5	81.7	7.5	5	453	14	35	60	120	195	280	295	450
Education	High School Graduate	392	87.6	94.7	4.8	2	675	10	30	60	115	185	255	450	510
Education	< College	238	92.0	111.8	7.2	4	750	10	30	60	110	190	290	555	655
Education	College Graduate	127	85.2	74.6	6.6	5	370	15	30	60	110	180	230	345	355
Education	Post Graduate	66	112.4	118.0	14.5	10	650	10	35	80	135	220	412	445	650
Census Region	Northeast	170	85.4	104.2	8.0	2	695	10	20	50	110	186	260	445	630
Census Region	Midwest	268	91.2	94.4	5.8	1	750	10	30	60	119	205	245	390	460
Census Region	South	491	87.3	100.1	4.5	4	955	10	30	60	111	180	235	445	595
Census Region	West	243	74.7	81.3	5.2	5	478	10	23	52	90	160	235	395	440
Day Of Week	Weekday	796	80.1	90.6	3.2	1	750	10	30	55	101	170	230	375	510
Day Of Week	Weekend	376	96.3	105.5	5.4	2	955	12	30	61	120	192	280	430	460
Season	Winter	322	78.5	91.6	5.1	1	955	10	29	51	95	170	220	355	445
Season	Spring	300	92.5	100.2	5.8	1	695	10	30	60	120	208	268	443	549
Season	Summer	323	86.1	99.3	5.5	2	750	10	30	60	110	180	233	430	595
Season	Fall	227	84.2	90.9	6.0	5	675	10	30	60	105	165	265	395	465
Asthma	No	1,092	85.3	93.5	2.8	1	750	10	30	60	110	184	240	412	478
Asthma	Yes	72	83.6	125.3	14.8	5	955	10	20	46	115	170	235	395	955
Asthma	DK	8	101.9	129.7	45.8	10	390	10	20	60	128	390	390	390	390
Angina	No	1,142	84.9	95.2	2.8	1	955	10	30	60	110	180	235	395	475
Angina	Yes	20	93.4	116.0	25.9	5	555	8	38	70	103	141	351	555	555
Angina	DK	10	118.5	128.6	40.7	10	390	10	30	60	190	340	390	390	390
Bronchitis/Emphysema	No	1,128	85.5	96.6	2.9	1	955	10	30	60	110	180	240	412	478
Bronchitis/Emphysema	Yes	35	77.8	60.5	10.2	5	240	5	30	60	120	165	220	240	240
Bronchitis/Emphysema	DK	9	93.3	123.9	41.3	10	390	10	20	60	65	390	390	390	390

Table 16-24. Time Spent (minutes/day) in Selected Vehicles, Other Mass Transit, and All Vehicles Combined, Doers Only (continued)

		Bus													
								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		469	74.6	93.5	4.3	2	945	10	30	55	90	125	180	435	570
Sex	Male	219	77.3	104.1	7.0	5	945	10	30	55	90	135	180	460	570
Sex	Female	250	72.4	83.3	5.3	2	640	15	30	55	90	120	175	420	501
Age (years)	-	14	145.0	167.2	44.7	10	605	10	60	100	140	435	605	605	605
Age (years)	1 to 4	5	56.0	40.2	18.0	15	120	15	30	55	60	120	120	120	120
Age (years)	5 to 11	133	48.4	29.4	2.6	5	140	10	25	43	67	90	110	120	122
Age (years)	12 to 17	143	59.4	46.3	3.9	7	370	10	30	54	75	110	135	179	225
Age (years)	18 to 64	147	96.6	128.4	10.6	2	945	10	30	60	110	180	405	640	690
Age (years)	>64	27	132.0	144.6	27.8	10	570	20	45	73	130	435	460	570	570
Race	White	311	70.1	89.5	5.1	2	945	10	30	54	80	120	147	405	501
Race	Black	101	85.2	92.4	9.2	5	570	15	35	60	110	140	185	460	468
Race	Asian	15	58.0	58.5	15.1	5	175	5	20	20	120	155	175	175	175
Race	Some Others	14	107.1	176.5	47.2	20	690	20	30	43	100	225	690	690	690
Race	Hispanic	24	65.5	71.5	14.6	15	370	20	30	43	87	90	120	370	370
Race	Refused	4	168.0	196.2	98.1	10	435	10	21	114	315	435	435	435	435
Hispanic	No	415	72.8	86.1	4.2	2	945	10	30	55	90	125	165	420	468
Hispanic	Yes	46	83.9	138.9	20.5	7	690	15	30	38	85	145	370	690	690
Hispanic	DK	2	47.5	10.6	7.5	40	55	40	40	48	55	55	55	55	55
Hispanic	Refused	6	137.8	159.6	65.2	10	435	10	32	78	195	435	435	435	435
Employment	-	274	54.0	39.4	2.4	5	370	10	29	50	70	100	120	150	179
Employment	Full Time	95	122.6	168.8	17.3	5	945	10	30	60	120	405	570	690	945
Employment	Part Time	34	83.3	79.3	13.6	2	468	10	40	60	100	135	185	468	468
Employment	Not Employed	61	80.3	69.2	8.9	5	460	10	30	65	120	135	165	205	460
Employment	Refused	5	167.4	169.9	76.0	10	435	10	32	165	195	435	435	435	435
Education	-	295	55.3	45.0	2.6	5	435	10	29	49	70	100	120	155	225
Education	< High School	25	120.4	124.3	24.9	10	570	30	45	90	135	195	405	570	570
Education	High School Graduate	57	111.6	116.7	15.5	10	501	20	45	73	120	225	435	468	501
Education	< College	38	108.8	133.4	21.6	10	640	20	40	75	120	195	605	640	640
Education	College Graduate	30	84.6	128.1	23.4	2	690	5	30	60	90	130	300	690	690
Education	Post Graduate	24	110.5	199.2	40.7	5	945	10	29	60	102	125	460	945	945
Census Region	Northeast	145	77.1	75.4	6.3	7	435	15	30	60	95	135	180	435	435
Census Region	Midwest	102	69.7	103.3	10.2	2	945	10	30	55	85	120	125	175	468
Census Region	South	142	71.7	82.8	7.0	5	570	10	30	50	80	135	180	460	501
Census Region	West	80	81.8	124.3	13.9	5	690	13	30	42	90	128	298	640	690
Day Of Week	Weekday	426	70.6	84.6	4.1	2	690	10	30	50	85	120	165	435	501
Day Of Week	Weekend	43	114.7	152.2	23.2	10	945	20	45	90	120	180	300	945	945
Season	Winter	158	78.3	98.1	7.8	5	690	10	30	58	90	125	180	435	605
Season	Spring	140	61.6	53.5	4.5	2	460	10	30	50	75	120	138	205	225
Season	Summer	94	86.6	116.7	12.0	5	945	10	30	60	95	155	225	435	945
Season	Fall	77	76.2	107.5	12.3	5	640	10	30	50	80	125	175	570	640
Asthma	No	413	76.4	96.8	4.8	2	945	10	30	55	90	125	180	435	570
Asthma	Yes	50	55.4	39.3	5.6	5	195	10	30	48	71	115	135	165	195
Asthma	DK	6	111.5	161.5	65.9	10	435	10	32	46	100	435	435	435	435
Angina	No	459	73.4	91.3	4.3	2	945	10	30	55	90	125	179	420	570
Angina	Yes	4	168.8	182.7	91.3	20	435	20	60	110	278	435	435	435	435
Angina	DK	6	109.5	162.4	66.3	10	435	10	30	41	100	435	435	435	435
Bronchitis/Emphysema	No	442	74.8	94.3	4.5	2	945	10	30	55	90	125	180	435	570
Bronchitis/Emphysema	Yes	19	58.2	39.9	9.1	10	155	10	30	55	65	125	155	155	155
Bronchitis/Emphysema	DK	8	104.6	137.9	48.8	10	435	10	29	68	100	435	435	435	435

Table 16-24. Time Spent (minutes/day) in Selected Vehicles, Other Mass Transit, and All Vehicles Combined, Doers Only (continued)

Train/Subway/Rapid Transit

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		116	97.8	136.3	12.7	1	810	5	28	60	120	189	415	690	720
Gender	Male	62	91.6	119.4	15.2	5	720	10	24	60	120	180	240	480	720
Gender	Female	54	104.8	154.3	21.0	1	810	2	30	60	120	195	480	690	810
Age (years)	-	8	191.9	256.8	90.8	20	810	20	55	118	180	810	810	810	810
Age (years)	1 to 4	2	92.5	38.9	27.5	65	120	65	65	93	120	120	120	120	120
Age (years)	5 to 11	3	166.7	271.4	156.7	5	480	5	5	15	480	480	480	480	480
Age (years)	12 to 17	2	100.0	56.6	40.0	60	140	60	60	100	140	140	140	140	140
Age (years)	18 to 64	92	85.0	106.5	11.1	1	720	5	30	60	105	175	240	480	720
Age (years)	> 64	9	122.7	219.5	73.2	10	690	10	10	24	120	690	690	690	690
Race	White	64	89.5	139.7	17.5	1	720	5	22	55	74	195	380	690	720
Race	Black	26	131.4	168.4	33.0	5	810	10	35	118	135	195	480	810	810
Race	Asian	3	79.7	17.0	9.8	60	90	60	60	89	90	90	90	90	90
Race	Some Others	4	71.3	47.8	23.8	30	140	30	43	58	100	140	140	140	140
Race	Hispanic	16	88.6	98.9	24.7	5	415	5	20	70	113	165	415	415	415
Race	Refused	3	85.0	56.3	32.5	20	120	20	20	115	120	120	120	120	120
Hispanic	No	89	101.3	149.7	15.9	1	810	5	25	60	120	195	480	720	810
Hispanic	Yes	22	87.0	85.6	18.2	5	415	10	40	70	120	130	165	415	415
Hispanic	DK	2	79.5	34.6	24.5	55	104	55	55	80	104	104	104	104	104
Hispanic	Refused	3	85.0	56.3	32.5	20	120	20	20	115	120	120	120	120	120
Employment	-	7	126.4	163.6	61.8	5	480	5	15	65	140	480	480	480	480
Employment	Full Time	76	98.5	128.2	14.7	1	720	5	30	60	120	189	380	690	720
Employment	Part Time	10	61.7	46.4	14.7	5	160	5	15	58	89	125	160	160	160
Employment	Not Employed	21	101.7	186.2	40.6	1	810	10	10	55	90	165	415	810	810
Employment	Refused	2	107.5	123.7	87.5	20	195	20	20	108	195	195	195	195	195
Education	-	10	122.0	140.0	44.3	5	480	5	20	93	140	338	480	480	480
Education	< High School	6	181.8	311.8	127.3	1	810	1	5	70	135	810	810	810	810
Education	High School Graduate	30	89.4	109.2	19.9	1	480	2	30	60	120	178	415	480	480
Education	< College	26	125.7	189.6	37.2	10	720	10	20	60	120	380	690	720	720
Education	College Graduate	24	66.5	50.3	10.3	5	180	10	25	55	103	125	175	180	180
Education	Post Graduate	20	74.2	59.4	13.3	10	240	13	30	60	97	165	215	240	240
Census Region	Northeast	72	111.8	134.6	15.9	10	810	20	49	63	123	189	415	690	810
Census Region	Midwest	14	64.2	109.5	29.3	2	380	2	10	23	50	240	380	380	380
Census Region	South	15	75.7	121.1	31.3	1	480	1	10	30	90	160	480	480	480
Census Region	West	15	83.5	179.4	46.3	5	720	5	10	30	75	120	720	720	720
Day Of Week	Weekday	96	101.6	127.2	13.0	1	720	10	30	60	120	195	415	690	720
Day Of Week	Weekend	20	79.4	176.6	39.5	2	810	4	8	33	60	120	465	810	810
Season	Winter	26	138.2	196.3	38.5	5	810	10	30	80	130	240	720	810	810
Season	Spring	29	77.3	89.5	16.6	2	480	5	25	60	105	135	175	480	480
Season	Summer	37	106.1	140.7	23.1	5	690	10	30	60	120	195	480	690	690
Season	Fall	24	65.9	82.2	16.8	1	380	1	15	43	83	160	180	380	380
Asthma	No	106	94.2	122.9	11.9	1	720	5	30	60	120	180	380	480	690
Asthma	Yes	7	146.6	294.0	111.1	1	810	1	10	30	90	810	810	810	810
Asthma	DK	3	111.7	87.8	50.7	20	195	20	20	120	195	195	195	195	195
Angina	No	112	96.5	137.9	13.0	1	810	5	28	60	118	175	415	690	720
Angina	DK	4	132.5	82.9	41.5	20	195	20	70	158	195	195	195	195	195
Bronchitis/Emphysema	No	112	98.2	138.0	13.0	1	810	5	30	60	120	180	415	690	720
Bronchitis/Emphysema	Yes	1	10.0	-	-	10	10	10	10	10	10	10	10	10	10
Bronchitis/Emphysema	DK	3	111.7	87.8	50.7	20	195	20	20	120	195	195	195	195	195

Table 16-24. Time Spent (minutes/day) in Selected Vehicles, Other Mass Transit, and All Vehicles Combined, Doers Only (continued)

Airplane															
								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		53	234.0	203.7	28.0	10	900	15	70	210	300	480	660	900	900
Gender	Male	28	241.3	231.0	43.7	15	900	20	65	210	293	555	900	900	900
Gender	Female	25	225.9	172.6	34.5	10	660	15	110	210	300	480	510	660	660
Age (years)	-	3	175.0	145.7	84.1	15	300	15	15	210	300	300	300	300	300
Age (years)	12 to 17	3	113.3	118.6	68.5	15	245	15	15	80	245	245	245	245	245
Age (years)	18 to 64	42	226.4	194.0	29.9	10	900	20	60	203	300	480	555	900	900
Age (years)	> 64	5	405.4	292.4	130.8	195	900	195	210	287	435	900	900	900	900
Race	White	44	241.1	215.6	32.5	10	900	15	65	210	300	510	660	900	900
Race	Black	7	199.3	134.4	50.8	15	435	15	110	210	255	435	435	435	435
Race	Asian	1	60.0	-	-	60	60	60	60	60	60	60	60	60	60
Race	Hispanic	1	340.0	-	-	340	340	340	340	340	340	340	340	340	340
Hispanic	No	51	234.7	206.2	28.9	10	900	15	60	210	300	480	660	900	900
Hispanic	Yes	2	215.0	176.8	125.0	90	340	90	90	215	340	340	340	340	340
Employment	-	3	113.3	118.6	68.5	15	245	15	15	80	245	245	245	245	245
Employment	Full Time	33	212.4	194.0	33.8	15	900	20	60	180	285	480	555	900	900
Employment	Part Time	3	510.0	375.9	217.0	150	900	150	150	480	900	900	900	900	900
Employment	Not Employed	13	259.4	168.4	46.7	10	660	10	195	225	300	435	660	660	660
Employment	Refused	1	150.0	-	-	150	150	150	150	150	150	150	150	150	150
Education	-	4	122.5	98.5	49.3	15	245	15	48	115	198	245	245	245	245
Education	< High School	4	111.3	179.6	89.8	10	380	10	13	28	210	380	380	380	380
Education	High School Graduate	9	253.9	191.0	63.7	15	660	15	195	270	285	660	660	660	660
Education	< College	13	293.8	170.8	47.4	20	555	20	180	300	435	510	555	555	555
Education	College Graduate	15	194.8	114.0	29.4	45	480	45	90	210	255	287	480	480	480
Education	Post Graduate	8	305.0	375.1	132.6	20	900	20	45	138	578	900	900	900	900
Census Region	Northeast	17	254.7	234.8	57.0	15	900	15	70	245	380	510	900	900	900
Census Region	Midwest	17	235.1	234.3	56.8	15	900	15	60	195	287	660	900	900	900
Census Region	South	9	212.8	103.6	34.5	15	340	15	150	255	270	340	340	340	340
Census Region	West	10	216.0	181.7	57.5	10	555	10	45	203	240	518	555	555	555
Day Of Week	Weekday	37	258.9	192.8	31.7	15	900	15	150	230	305	510	660	900	900
Day Of Week	Weekend	16	176.4	222.8	55.7	10	900	10	38	95	263	360	900	900	900
Season	Winter	17	216.3	172.8	41.9	20	660	20	60	210	275	480	660	660	660
Season	Spring	14	191.8	160.5	42.9	15	555	15	90	150	230	435	555	555	555
Season	Summer	17	230.9	222.2	53.9	10	900	10	60	245	300	480	900	900	900
Season	Fall	5	423.0	294.4	131.7	180	900	180	240	285	510	900	900	900	900
Asthma	No	51	224.8	201.5	28.2	10	900	15	60	210	287	480	660	900	900
Asthma	Yes	2	467.5	123.7	87.5	380	555	380	380	468	555	555	555	555	555
Angina	No	51	233.7	207.6	29.1	10	900	15	60	210	300	480	660	900	900
Angina	Yes	2	241.0	65.1	46.0	195	287	195	195	241	287	287	287	287	287
Bronchitis/Emphysema	No	51	231.6	206.7	28.9	10	900	15	60	210	300	480	660	900	900
Bronchitis/Emphysema	Yes	2	295.0	120.2	85.0	210	380	210	210	295	380	380	380	380	380

Table 16-24. Time Spent (minutes/day) in Selected Vehicles, Other Mass Transit, and All Vehicles Combined, Doers Only (continued)

All Vehicles Combined

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		7,743	97.3	104.9	1.2	1	1,440	12	40	70	120	190	270	425	570
Sex	Male	3,603	103.7	119.7	2.0	1	1,440	10	40	70	120	205	295	478	655
Sex	Female	4,138	91.7	89.8	1.4	1	995	12	40	70	115	180	240	385	465
Sex	Refused	2	30.0	14.1	10.0	20	40	20	20	30	40	40	40	40	40
Age (years)	-	144	117.0	129.1	10.8	5	810	20	40	80	143	210	435	593	660
Age (years)	1 to 4	335	68.1	75.5	4.1	1	955	10	30	47	85	150	200	245	270
Age (years)	5 to 11	571	71.0	77.6	3.2	1	900	10	25	51	90	140	171	275	360
Age (years)	12 to 17	500	81.5	79.8	3.6	1	790	10	30	60	100	166	233	345	405
Age (years)	18 to 64	5,286	104.0	111.1	1.5	1	1,440	15	43	75	120	200	285	450	620
Age (years)	>64	907	90.9	93.9	3.1	4	900	10	35	60	120	190	258	400	460
Race	White	6,288	97.2	107.2	1.4	1	1,440	10	40	70	120	190	270	425	595
Race	Black	766	98.7	91.3	3.3	2	810	15	45	75	120	195	265	390	485
Race	Asian	133	83.4	74.9	6.5	5	540	20	35	70	105	150	210	330	360
Race	Some Others	144	96.2	94.0	7.8	3	690	10	40	70	128	180	250	345	540
Race	Hispanic	319	101.7	110.4	6.2	2	825	20	41	70	120	190	335	465	620
Race	Refused	93	93.6	90.1	9.3	10	480	15	30	65	120	205	255	420	480
Hispanic	No	7,050	97.1	104.8	1.2	1	1,440	10	40	70	120	190	270	420	566
Hispanic	Yes	578	100.0	109.0	4.5	2	825	15	40	70	120	190	285	480	630
Hispanic	DK	34	73.0	68.3	11.7	5	325	6	25	60	97	175	200	325	325
Hispanic	Refused	81	98.9	95.3	10.6	10	480	15	30	65	130	220	255	420	480
Employment	-	1,388	73.6	77.8	2.1	1	955	10	30	55	90	150	195	275	382
Employment	Full Time	3,732	105.8	116.2	1.9	4	1,440	16	45	75	124	198	290	475	660
Employment	Part Time	720	98.8	95.0	3.5	2	960	10	45	75	120	195	260	380	470
Employment	Not Employed	1,849	96.6	99.5	2.3	1	995	10	37	65	120	200	275	420	526
Employment	Refused	54	120.3	108.6	14.8	10	480	20	35	88	190	290	330	390	480
Education	-	1,550	76.4	78.9	2.0	1	955	10	30	60	95	155	201	303	385
Education	< High School	561	100.8	120.2	5.1	5	1,440	15	40	70	120	180	265	460	620
Education	High School Graduate	2,166	101.6	107.6	2.3	1	1,210	12	40	70	120	210	286	445	570
Education	< College	1,556	103.2	110.1	2.8	2	1,280	15	40	75	120	195	285	460	630
Education	College Graduate	1,108	104.5	109.5	3.3	4	1,215	15	45	75	125	200	280	450	675
Education	Post Graduate	802	101.9	108.7	3.8	4	1,357	20	45	76	120	195	270	365	480
Census Region	Northeast	1,662	98.6	106.6	2.6	1	1,215	15	40	70	120	190	275	425	570
Census Region	Midwest	1,759	101.2	114.6	2.7	1	1,440	10	40	70	120	205	290	435	595
Census Region	South	2,704	96.1	97.7	1.9	1	955	13	40	70	120	190	250	420	558
Census Region	West	1,618	93.7	103.7	2.6	2	1,280	10	35	65	115	180	260	420	540
Day Of Week	Weekday	5,289	94.4	101.4	1.4	1	1,215	10	40	66	115	180	260	435	575
Day Of Week	Weekend	2,454	103.4	111.9	2.3	1	1,440	13	40	75	125	205	280	420	540
Season	Winter	2,037	94.3	101.4	2.2	1	1,080	10	35	65	116	190	270	425	544
Season	Spring	2,032	99.6	110.5	2.5	1	1,440	12	40	70	120	200	275	440	546
Season	Summer	2,090	97.8	103.8	2.3	1	1,357	10	40	70	120	190	260	415	558
Season	Fall	1,584	97.4	103.7	2.6	1	1,280	14	40	70	120	180	265	420	620
Asthma	No	7,152	97.3	104.6	1.2	1	1,440	10	40	70	120	190	270	425	570
Asthma	Yes	544	97.2	110.8	4.8	4	955	17	40	65	117	180	255	460	705
Asthma	DK	47	100.0	95.2	13.9	10	480	10	30	75	120	220	239	480	480
Angina	No	7,516	97.3	105.2	1.2	1	1,440	11	40	70	120	190	270	425	570
Angina	Yes	172	93.1	93.1	7.1	8	615	15	30	65	120	185	280	420	540
Angina	DK	55	108.9	99.7	13.4	10	480	20	35	75	150	235	360	390	480
Bronchitis/Emphysema	No	7,349	97.6	106.1	1.2	1	1,440	10	40	70	120	190	270	425	580
Bronchitis/Emphysema	Yes	342	91.0	79.3	4.3	2	505	15	40	70	115	195	240	325	460
Bronchitis/Emphysema	DK	52	98.9	93.8	13.0	5	480	10	30	74	145	195	239	390	480

- = Indicates missing data.
DK = The respondent replied "don't know".
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-25. Time Spent (minutes/day) in Selected Activities Whole Population and Doers Only, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Sleeping/Napping—Whole Population															
Birth to <1	63	782	485	519	546	579	613	668	762	873	1,011	1,080	1,121	1,144	1,175
1 to <2	118	779	360	483	510	579	627	700	780	855	925	962	987	1,098	1,320
2 to <3	118	716	270	365	470	523	594	635	708	805	870	917	937	944	990
3 to <6	357	681	0	480	510	539	573	630	675	735	795	840	893	916	1,110
6 to <11	497	613	120	295	390	458	510	570	625	660	720	750	831	868	945
11 to <16	466	569	0	320	376	415	450	510	558	630	705	762	809	907	1,015
16 to <21	481	537	0	239	295	360	390	450	525	615	690	750	840	906	1,317
Sleeping/Napping—Doers Only															
Birth to <1	63	782	485	519	546	579	613	668	762	873	1,011	1,080	1,121	1,144	1,175
1 to <2	118	779	360	483	510	579	627	700	780	855	925	962	987	1,098	1,320
2 to <3	118	716	270	365	470	523	594	635	708	805	870	917	937	944	990
3 to <6	356	683	420	491	510	540	578	630	675	738	795	840	893	916	1,110
6 to <11	497	613	120	295	390	458	510	570	625	660	720	750	831	868	945
11 to <16	465	571	150	341	379	415	450	510	560	630	705	762	809	907	1,015
16 to <21	480	538	85	252	299	360	390	450	525	615	690	751	840	906	1,317
Eating—Whole Population															
Birth to <1	63	117	0	6	12	36	45	73	110	145	194	224	334	345	345
1 to <2	118	98	0	10	10	29	40	60	90	120	167	206	233	244	270
2 to <3	118	92	15	15	15	20	30	60	89	120	157	176	198	208	270
3 to <6	357	78	0	0	0	15	28	45	75	105	135	150	180	217	265
6 to <11	497	65	0	0	0	10	20	35	60	88	115	139	155	176	255
11 to <16	466	52	0	0	0	0	10	30	45	74	100	120	146	162	205
16 to <21	481	52	0	0	0	0	0	20	40	65	105	135	192	210	630
Eating—Doers Only															
Birth to <1	62	118	10	16	23	40	46	77	110	148	195	224	335	345	345
1 to <2	117	99	10	10	12	30	40	60	90	120	167	206	234	244	270
2 to <3	118	92	15	15	15	20	30	60	89	120	157	176	198	208	270
3 to <6	349	80	2	10	15	20	30	45	75	105	135	150	180	218	265
6 to <11	480	67	5	10	10	15	20	40	60	90	115	140	157	179	255
11 to <16	432	56	2	5	7	10	20	30	50	75	100	125	148	163	205
16 to <21	426	59	2	5	9	10	15	30	45	75	105	144	197	210	630
Attending School Full-Time—Whole Population															
Birth to <1	63	11	0	0	0	0	0	0	0	0	0	0	83	265	550
1 to <2	118	28	0	0	0	0	0	0	0	0	0	204	546	594	665
2 to <3	118	65	0	0	0	0	0	0	0	0	334	502	564	618	710
3 to <6	357	73	0	0	0	0	0	0	0	0	392	510	558	581	630
6 to <11	497	183	0	0	0	0	0	0	0	390	435	460	525	570	645
11 to <16	466	187	0	0	0	0	0	0	0	409	445	464	487	500	595
16 to <21	481	117	0	0	0	0	0	0	0	270	408	445	489	551	825
Attending School Full-Time—Doers Only															
Birth to <1	3	-	60	-	-	-	-	-	-	-	-	-	-	-	550
1 to <2	9	-	20	-	-	-	-	-	-	-	-	-	-	-	665
2 to <3	20	385	20	37	53	103	119	226	458	520	576	632	679	694	710
3 to <6	71	366	30	37	66	128	165	203	395	510	558	583	615	627	630
6 to <11	234	389	60	125	164	211	311	370	390	425	460	497	570	600	645
11 to <16	217	401	10	86	108	270	343	385	415	440	467	485	505	548	595
16 to <21	162	347	20	46	78	126	195	270	370	420	459	519	567	609	825

Table 16-25. Time Spent (minutes/day) in Selected Activities Whole Population and Doers Only, Children <21 Years (continued)

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Outdoor Recreation—Whole Population															
Birth to <1	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	4	0	0	0	0	0	0	0	0	0	0	15	28	370
3 to <6	357	6	0	0	0	0	0	0	0	0	0	0	60	172	630
6 to <11	497	7	0	0	0	0	0	0	0	0	0	0	142	226	574
11 to <16	466	6	0	0	0	0	0	0	0	0	0	0	142	191	465
16 to <21	481	6	0	0	0	0	0	0	0	0	0	0	103	189	570
Outdoor Recreation—Doers Only															
Birth to <1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	4	-	15	-	-	-	-	-	-	-	-	-	-	-	370
3 to <6	11	207	30	30	30	30	30	60	150	240	585	608	621	626	630
6 to <11	17	204	60	60	60	60	66	120	165	245	351	403	506	540	574
11 to <16	22	138	5	5	5	5	11	60	126	180	234	411	446	456	465
16 to <21	13	228	30	35	41	57	77	130	180	300	420	480	534	552	570
Active Sports—Whole Population															
Birth to <1	63	15	0	0	0	0	0	0	0	0	60	90	131	143	155
1 to <2	118	20	0	0	0	0	0	0	0	0	68	131	180	201	270
2 to <3	118	27	0	0	0	0	0	0	0	0	110	180	257	319	390
3 to <6	357	40	0	0	0	0	0	0	0	30	135	242	330	408	630
6 to <11	497	51	0	0	0	0	0	0	0	60	172	272	371	435	975
11 to <16	466	53	0	0	0	0	0	0	0	74	168	245	309	425	1,065
16 to <21	481	35	0	0	0	0	0	0	0	0	145	180	285	386	565
Active Sports—Doers Only															
Birth to <1	13	75	25	26	26	28	31	40	60	90	132	143	150	153	155
1 to <2	24	96	10	15	19	30	33	60	73	131	180	201	240	255	270
2 to <3	26	124	15	18	20	26	30	41	98	179	253	314	360	375	390
3 to <6	97	149	15	20	29	30	30	60	120	180	315	354	559	625	630
6 to <11	175	146	2	12	15	20	30	60	110	193	312	393	450	522	975
11 to <16	179	137	5	5	15	15	30	60	115	180	261	314	442	533	1,065
16 to <21	117	143	5	15	15	20	30	60	120	180	272	371	501	519	565
Exercise—Whole Population															
Birth to <1	63	13	0	0	0	0	0	0	0	0	0	0	122	354	670
1 to <2	118	2	0	0	0	0	0	0	0	0	0	0	25	30	150
2 to <3	118	1	0	0	0	0	0	0	0	0	0	0	0	0	60
3 to <6	357	3	0	0	0	0	0	0	0	0	0	0	0	54	525
6 to <11	497	5	0	0	0	0	0	0	0	0	0	0	100	137	450
11 to <16	466	5	0	0	0	0	0	0	0	0	0	30	70	114	245
16 to <21	481	8	0	0	0	0	0	0	0	0	0	60	151	176	300
Exercise—Doers Only															
Birth to <1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 to <6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 to <11	20	124	15	17	19	25	30	60	100	146	226	284	384	417	450
11 to <16	28	75	20	21	23	27	30	42	60	101	128	148	194	219	245
16 to <21	41	99	15	15	15	25	30	40	90	145	180	240	260	280	300

Table 16-25. Time Spent (minutes/day) in Selected Activities Whole Population and Doers Only, Children <21 Years (continued)

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Walking—Whole Population															
Birth to <1	63	6	0	0	0	0	0	0	0	0	9.2	29	64	104	160
1 to <2	118	2	0	0	0	0	0	0	0	0	0	10	40	58	60
2 to <3	118	3	0	0	0	0	0	0	0	0	10	17	45	54	60
3 to <6	357	3	0	0	0	0	0	0	0	0	4	20	35	60	60
6 to <11	497	4	0	0	0	0	0	0	0	0	14	30	40	55	170
11 to <16	466	10	0	0	0	0	0	0	0	0	30	55	79	130	190
16 to <21	481	8	0	0	0	0	0	0	0	0	20	45	90	127	410
Walking—Doers Only															
Birth to <1	9	-	4	-	-	-	-	-	-	-	-	-	-	-	160
1 to <2	9	-	4	-	-	-	-	-	-	-	-	-	-	-	60
2 to <3	19	19	1	1	1	2	2	7	10	28	51	56	58	59	60
3 to <6	44	20	1	1	1	1	2	5	15	30	56	60	60	60	60
6 to <11	118	18	1	1	1	2	2	5	10	25	40	51	65	94	170
11 to <16	190	25	1	1	1	2	3	5	14	30	60	78	134	154	190
16 to <21	128	30	1	1	2	2	3	5	18	32	62	120	148	175	410

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only

Sleeping/Napping

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		9,362	526.3	134.4	1.4	30	1,430	345	445	510	600	690	760	850	925
Sex	Male	4,283	523.3	135.2	2.1	30	1,295	330	435	510	600	690	765	860	925
Sex	Female	5,075	528.7	133.7	1.8	30	1,430	350	450	510	600	690	750	840	925
Sex	Refused	4	645.0	123.7	61.8	540	780	540	540	630	750	780	780	780	780
Age (years)	-	185	502.3	125.4	9.2	195	908	330	420	480	555	655	745	865	900
Age (years)	1 to 4	499	732.4	124.3	5.6	270	1,320	540	655	720	810	900	930	1,005	1,110
Age (years)	5 to 11	702	625.1	100.7	3.8	120	1,110	480	570	630	680	725	780	840	875
Age (years)	12 to 17	588	563.7	110.8	4.6	150	1,015	395	484	550	630	705	750	810	900
Age (years)	18 to 64	6,041	496.9	123.0	1.6	30	1,420	330	420	480	555	630	705	780	868
Age (years)	>64	1,347	517.1	117.5	3.2	30	1,430	345	450	510	570	660	720	780	860
Race	White	7,576	523.6	129.5	1.5	30	1,430	350	445	510	600	690	750	840	900
Race	Black	940	541.3	162.7	5.3	60	1,415	315	424	530	630	738	823	940	1,020
Race	Asian	156	537.1	118.1	9.5	300	920	345	468	540	600	690	735	840	870
Race	Some Others	181	528.8	142.3	10.6	60	905	300	420	525	630	720	769	810	842
Race	Hispanic	383	538.0	148.9	7.6	60	1,125	315	450	540	630	720	765	870	930
Race	Refused	126	523.4	143.7	12.8	180	1,140	330	420	510	600	720	780	870	930
Hispanic	No	8,514	525.2	133.2	1.4	30	1,430	345	445	510	600	690	750	855	925
Hispanic	Yes	700	540.1	147.1	5.6	60	1,125	320	450	540	630	720	778	843	915
Hispanic	DK	45	527.5	139.3	20.8	195	842	345	420	515	659	690	710	842	842
Hispanic	Refused	103	521.6	138.9	13.7	240	930	330	420	510	590	720	780	865	870
Employment	-	1,771	636.6	128.5	3.1	120	1,320	440	555	630	705	802	860	930	975
Employment	Full Time	4,085	487.2	118.9	1.9	30	1,420	325	420	480	540	628	685	770	840
Employment	Part Time	798	502.8	117.4	4.2	60	1,005	330	435	495	570	645	720	780	860
Employment	Not Employed	2,638	520.3	125.5	2.4	30	1,430	345	450	510	590	660	720	800	885
Employment	Refused	70	513.7	136.5	16.3	210	930	320	420	490	570	697	780	900	930
Education	-	1,966	625.6	134.0	3.0	120	1,420	420	540	628	699	790	855	926	975
Education	< High School	832	515.4	135.7	4.7	30	1,317	300	435	510	585	670	750	860	900
Education	High School Graduate	2,604	505.4	123.0	2.4	30	1,430	330	420	495	570	659	720	780	840
Education	< College	1,791	496.6	119.9	2.8	60	1,350	315	420	480	565	630	690	779	845
Education	College Graduate	1,245	492.5	117.6	3.3	75	1,404	330	420	480	540	629	690	775	900
Education	Post Graduate	924	486.7	110.4	3.6	105	1,295	345	420	480	540	615	660	725	800
Census Region	Northeast	2,068	523.1	133.7	2.9	55	1,420	345	435	510	600	690	760	860	930
Census Region	Midwest	2,096	520.8	127.6	2.8	30	1,215	330	440	510	598	690	745	840	870
Census Region	South	3,234	529.0	135.7	2.4	30	1,430	345	450	510	600	699	765	855	925
Census Region	West	1,964	530.9	140.0	3.2	60	1,404	345	450	510	600	690	769	862	940
Day Of Week	Weekday	6,303	511.1	131.8	1.7	30	1,430	330	420	495	570	670	745	840	920
Day Of Week	Weekend	3,059	557.5	134.4	2.4	30	1,420	360	480	540	630	720	780	870	925
Season	Winter	2,514	534.9	134.7	2.7	55	1,404	355	450	520	600	700	780	870	930
Season	Spring	2,431	526.8	130.5	2.6	30	1,175	345	445	510	600	690	750	840	900
Season	Summer	2,533	527.7	139.5	2.8	30	1,430	330	435	510	600	699	765	840	930
Season	Fall	1,884	512.2	131.1	3.0	60	1,420	330	430	505	570	660	735	840	900
Asthma	No	8,608	525.1	133.6	1.4	30	1,430	345	445	510	600	690	750	840	915
Asthma	Yes	692	540.1	143.6	5.5	30	1,404	330	450	538	618	715	780	900	945
Asthma	DK	62	544.2	141.0	17.9	300	1,035	330	465	535	600	720	780	930	1,035
Angina	No	9,039	526.8	134.2	1.4	30	1,420	345	445	510	600	690	760	855	925
Angina	Yes	249	513.7	137.7	8.7	60	1,430	300	445	510	595	660	735	795	845
Angina	DK	74	511.4	146.3	17.0	30	930	300	420	510	600	720	780	840	930
Bronchitis/Emphysema	No	8,860	526.5	134.3	1.4	30	1,430	345	445	510	600	690	760	850	924
Bronchitis/Emphysema	Yes	432	521.7	138.5	6.7	80	1,110	300	420	510	600	705	765	840	930
Bronchitis/Emphysema	DK	70	521.2	131.9	15.8	210	930	300	450	510	600	690	745	840	930

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Eating or Drinking

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		8,627	74.9	54.8	0.6	1	900	15	35	60	96	140	175	215	270
Sex	Male	3,979	75.8	56.2	0.9	1	900	15	39	60	96	140	180	210	270
Sex	Female	4,644	74.1	53.6	0.8	2	640	15	34	60	98	140	170	225	270
Sex	Refused	4	60.0	21.2	10.6	30	75	30	45	68	75	75	75	75	75
Age (years)	-	157	75.3	50.1	4.0	10	315	15	30	65	100	145	150	195	285
Age (years)	1 to 4	492	93.5	52.9	2.4	2	345	20	60	90	120	160	190	225	270
Age (years)	5 to 11	680	68.5	39.0	1.5	5	255	15	40	65	90	120	143	165	195
Age (years)	12 to 17	538	55.9	35.0	1.5	2	210	10	30	50	75	105	125	150	170
Age (years)	18 to 64	5,464	71.9	55.1	0.7	1	900	15	30	60	90	135	170	220	270
Age (years)	>64	1,296	91.7	62.7	1.7	5	750	20	50	80	120	165	200	270	295
Race	White	7,049	77.0	55.7	0.7	1	900	15	40	64	100	145	180	225	270
Race	Black	808	59.9	46.6	1.6	2	505	15	30	50	75	119	140	200	225
Race	Asian	148	80.4	47.8	3.9	2	305	15	45	73	107	150	160	200	200
Race	Some Others	168	66.0	52.1	4.0	7	525	15	30	60	83	120	135	190	200
Race	Hispanic	345	68.7	51.9	2.8	2	435	12	30	60	90	125	165	195	225
Race	Refused	109	74.2	60.8	5.8	8	410	20	30	60	90	130	180	290	315
Hispanic	No	7,861	75.6	55.2	0.6	1	900	15	35	60	100	140	175	220	270
Hispanic	Yes	639	68.3	50.2	2.0	2	435	15	30	60	90	120	155	195	225
Hispanic	DK	41	60.4	37.1	5.8	5	150	15	30	55	90	120	130	150	150
Hispanic	Refused	86	68.9	55.5	6.0	8	410	15	30	60	90	115	155	210	410
Employment	-	1,695	72.2	44.9	1.1	2	345	15	40	65	90	133	150	195	210
Employment	Full Time	3,684	70.6	55.1	0.9	1	900	15	30	60	90	135	165	225	270
Employment	Part Time	715	72.2	55.4	2.1	2	509	15	30	60	90	135	170	230	260
Employment	Not Employed	2,472	83.9	59.1	1.2	2	750	15	45	75	110	150	185	235	285
Employment	Refused	61	71.0	61.0	7.8	8	385	15	30	55	90	120	145	235	385
Education	-	1,867	70.9	45.4	1.1	2	375	15	38	60	90	130	150	190	210
Education	< High School	758	72.3	57.4	2.1	2	460	15	30	60	90	135	180	230	315
Education	High School Graduate	2,363	74.9	57.1	1.2	1	900	15	35	60	96	140	175	220	270
Education	< College	1,612	73.9	56.5	1.4	2	525	15	30	60	90	145	175	230	275
Education	College Graduate	1,160	78.5	55.4	1.6	1	640	15	40	65	105	145	180	220	265
Education	Post Graduate	867	82.8	59.7	2.0	2	750	15	40	70	110	150	185	240	270
Census Region	Northeast	1,916	78.3	59.2	1.4	1	750	15	37	65	103	145	180	240	285
Census Region	Midwest	1,928	75.8	51.4	1.2	1	435	15	40	64	100	140	175	210	255
Census Region	South	2,960	71.4	55.1	1.0	2	900	15	30	60	90	135	165	210	270
Census Region	West	1,823	76.0	53.0	1.2	2	500	15	35	60	100	150	180	210	240
Day Of Week	Weekday	5,813	71.2	52.0	0.7	1	900	15	33	60	90	130	165	210	250
Day Of Week	Weekend	2,814	82.5	59.5	1.1	2	630	15	40	70	110	150	190	240	297
Season	Winter	2,332	76.1	56.4	1.2	2	640	15	39	65	96	140	175	240	275
Season	Spring	2,222	76.3	55.2	1.2	1	630	15	35	60	100	145	178	220	275
Season	Summer	2,352	73.5	53.3	1.1	1	750	15	35	60	95	135	170	210	260
Season	Fall	1,721	73.3	54.3	1.3	2	900	15	30	60	95	140	175	210	232
Asthma	No	7,937	75.2	54.8	0.6	1	900	15	35	60	100	140	175	215	270
Asthma	Yes	635	71.4	55.0	2.2	2	460	15	30	60	90	133	170	225	285
Asthma	DK	55	69.3	56.6	7.6	8	335	15	30	60	90	120	210	215	335
Angina	No	8,318	74.6	54.4	0.6	1	900	15	35	60	95	140	175	210	265
Angina	Yes	243	85.0	63.5	4.1	2	500	15	45	75	115	160	180	285	330
Angina	DK	66	75.7	67.3	8.3	5	435	15	30	60	90	150	195	215	435
Bronchitis/Emphysema	No	8,169	74.7	54.3	0.6	1	900	15	35	60	95	140	170	210	260
Bronchitis/Emphysema	Yes	397	80.7	65.2	3.3	2	460	15	30	60	110	150	180	285	360
Bronchitis/Emphysema	DK	61	67.0	47.7	6.1	8	230	15	30	60	90	120	155	215	230

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Working in a Main Job

Category	Population Group	*N*	Mean	SD	SE	Min	Max	Percentiles							
								5	25	50	75	90	95	98	99
All		3,259	475.9	179.1	3.1	1	1,440	120	395	500	570	660	740	840	930
Sex	Male	1,733	492.3	187.0	4.5	1	1,440	120	417	510	595	690	770	890	955
Sex	Female	1,526	457.3	167.7	4.3	2	1,440	120	390	485	543	620	690	785	850
Age (years)	-	80	472.4	183.3	20.5	5	940	118	378	483	560	673	850	900	940
Age (years)	1 to 4	3	16.7	11.5	6.7	10	30	10	10	10	30	30	30	30	30
Age (years)	5 to 11	10	150.4	185.8	58.8	2	550	2	10	68	264	448	550	550	550
Age (years)	12 to 17	38	293.2	180.7	29.3	5	840	15	185	269	390	510	675	840	840
Age (years)	18 to 64	2,993	484.8	173.1	3.2	1	1,440	140	420	505	570	660	745	840	930
Age (years)	>64	135	366.1	208.7	18.0	5	990	30	185	395	500	600	660	840	940
Race	White	2,630	477.5	179.0	3.5	1	1,440	120	400	500	570	660	735	845	933
Race	Black	343	466.6	176.0	9.5	5	1,037	105	390	490	550	655	735	880	990
Race	Asian	57	464.1	177.3	23.5	5	870	45	390	493	553	660	750	780	870
Race	Some Others	56	477.4	181.7	24.3	45	855	75	415	510	570	680	765	780	855
Race	Hispanic	125	465.9	185.3	16.6	2	840	95	360	485	580	720	750	825	840
Race	Refused	48	492.1	191.6	27.7	50	957	120	410	508	575	810	840	957	957
Hispanic	No	2,980	475.4	179.2	3.3	1	1,440	120	395	500	570	660	740	850	940
Hispanic	Yes	221	481.5	174.3	11.7	2	1,106	150	405	505	580	670	740	825	840
Hispanic	DK	12	529.6	146.2	42.2	295	757	295	425	554	610	710	757	757	757
Hispanic	Refused	46	468.5	201.3	29.7	10	860	115	350	498	585	780	818	860	860
Employment	-	47	257.9	202.8	29.6	2	840	5	65	245	390	540	625	840	840
Employment	Full Time	2,679	504.4	164.8	3.2	1	1,440	180	450	510	582	675	750	855	950
Employment	Part Time	395	364.6	159.4	8.0	5	945	80	250	365	480	540	600	675	795
Employment	Not Employed	112	270.9	216.0	20.4	4	990	9	83	245	378	600	675	795	870
Employment	Refused	26	513.6	155.5	30.5	170	840	225	440	510	570	778	790	840	840
Education	-	108	343.0	211.9	20.4	2	860	10	177	343	510	610	675	840	840
Education	< High School	217	473.5	216.7	14.7	4	1,440	85	360	485	568	710	795	940	1,080
Education	High School Graduate	1,045	482.0	180.6	5.6	1	1,440	120	405	500	565	670	765	890	979
Education	< College	795	475.6	174.0	6.2	2	1,440	140	409	495	563	648	750	825	905
Education	College Graduate	627	484.5	159.8	6.4	5	1,005	120	424	510	570	645	720	765	815
Education	Post Graduate	467	483.0	169.6	7.8	1	945	125	400	510	590	660	730	810	860
Census Region	Northeast	721	476.0	180.8	6.7	1	1,440	120	405	495	570	669	740	890	950
Census Region	Midwest	755	477.0	182.2	6.6	2	1,440	120	395	495	570	660	750	825	940
Census Region	South	1,142	478.2	176.7	5.2	1	1,440	105	405	505	570	660	735	840	900
Census Region	West	641	470.4	177.8	7.0	5	1,080	120	390	500	570	657	730	850	880
Day Of Week	Weekday	2,788	487.9	166.2	3.1	1	1,440	155	425	505	570	660	740	840	930
Day Of Week	Weekend	471	405.2	229.5	10.6	2	1,440	30	245	415	555	670	770	870	960
Season	Winter	864	475.8	172.8	5.9	5	1,440	150	390	495	570	660	735	835	900
Season	Spring	791	473.0	195.4	6.9	1	1,440	75	390	495	570	670	765	850	915
Season	Summer	910	477.2	179.9	6.0	1	1,215	120	400	500	565	670	750	890	979
Season	Fall	694	477.7	166.0	6.3	2	1,005	130	405	510	570	645	720	780	840
Asthma	No	3,042	477.0	177.0	3.2	1	1,440	120	400	500	570	660	740	840	930
Asthma	Yes	195	453.4	204.2	14.6	5	1,440	45	345	480	550	668	793	855	979
Asthma	DK	22	523.2	217.0	46.3	170	1,215	225	430	500	565	780	860	1,215	1,215
Angina	No	3,192	475.7	178.4	3.2	1	1,440	120	395	500	570	660	740	840	930
Angina	Yes	44	472.1	200.7	30.3	10	990	60	386	500	573	679	730	990	990
Angina	DK	23	507.4	230.3	48.0	80	1,215	170	430	500	565	780	860	1,215	1,215
Bronchitis/Emphysema	No	3,120	476.5	178.2	3.2	1	1,440	120	400	500	570	660	740	840	930
Bronchitis/Emphysema	Yes	116	447.0	189.4	17.6	5	985	30	368	480	558	644	720	800	855
Bronchitis/Emphysema	DK	23	535.2	226.3	47.2	170	1,215	225	430	500	600	860	875	1,215	1,215

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Attending Full Time School

								Percentiles								
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		884	358.5	130.3	4.4	1	840	95	300	390	435	483	550	600	640
Sex	Male	468	369.3	123.2	5.7	20	840	120	320	390	435	485	555	595	645
Sex	Female	416	346.4	137.1	6.7	1	710	75	263	385	430	480	535	600	628
Age (years)	-	7	232.1	148.1	56.0	10	495	10	180	210	320	495	495	495	495
Age (years)	1 to 4	56	365.0	199.2	26.6	20	710	30	173	428	530	595	628	665	710
Age (years)	5 to 11	297	387.8	98.0	5.7	60	645	170	360	390	435	485	555	600	630
Age (years)	12 to 17	271	392.3	85.0	5.2	10	605	200	375	405	435	460	485	510	555
Age (years)	18 to 64	247	292.2	154.6	9.8	1	840	60	180	289	400	480	535	645	785
Age (years)	>64	6	203.3	147.4	60.2	75	480	75	120	153	240	480	480	480	480
Race	White	665	362.9	128.5	5.0	1	825	107	310	392	435	485	550	600	630
Race	Black	92	351.8	129.6	13.5	40	710	70	287	388	433	465	526	645	710
Race	Asian	33	346.3	156.0	24.2	90	840	120	225	365	435	500	565	840	840
Race	Some Others	29	337.8	148.1	27.5	58	553	70	212	360	445	502	540	553	553
Race	Hispanic	58	345.3	124.0	16.3	30	565	85	260	378	430	480	510	510	565
Race	Refused	7	285.0	157.0	59.4	60	440	60	150	290	440	440	440	440	440
Hispanic	No	771	359.6	130.8	4.7	1	840	100	300	390	435	483	550	600	645
Hispanic	Yes	103	353.1	126.4	12.5	30	630	85	269	385	425	483	510	595	600
Hispanic	DK	4	315.5	167.8	83.9	65	416	65	221	391	410	415	415	415	415
Hispanic	Refused	6	348.3	140.6	57.4	150	445	150	185	435	440	445	445	445	445
Employment	-	608	386.5	107.3	4.4	10	710	165	361	400	440	485	550	595	625
Employment	Full Time	49	206.6	133.6	19.1	5	502	15	115	180	305	430	461	502	502
Employment	Part Time	89	304.7	134.8	14.3	25	695	90	210	295	395	480	500	585	695
Employment	Not Employed	135	325.3	161.0	13.9	1	840	60	215	340	420	500	605	785	825
Employment	Refused	3	270.0	147.2	85.0	185	440	185	185	440	440	440	440	440	440
Education	-	666	385.0	107.9	4.2	10	710	160	360	400	440	485	550	595	625
Education	< High School	14	267.1	129.3	34.6	5	415	5	175	310	357	385	415	415	415
Education	High School Graduate	54	238.5	141.1	19.2	58	785	60	125	212	330	400	480	480	785
Education	< College	100	303.4	170.6	17.1	1	840	60	185	273	415	526	614	760	833
Education	College Graduate	24	238.4	145.9	29.8	25	565	30	135	200	360	430	460	565	565
Education	Post Graduate	26	302.8	144.1	28.3	10	535	95	210	300	461	500	502	535	535
Census Region	Northeast	186	351.6	127.0	9.3	60	825	120	268	375	420	483	520	600	785
Census Region	Midwest	200	358.1	123.9	8.8	5	645	88	308	393	425	470	528	578	602
Census Region	South	322	373.9	139.7	7.8	10	840	60	330	405	450	500	565	625	645
Census Region	West	176	338.3	120.5	9.1	1	630	120	263	375	410	465	540	555	600
Day Of Week	Weekday	858	363.7	126.0	4.3	1	840	120	310	390	435	485	550	600	640
Day Of Week	Weekend	26	189.5	158.4	31.1	15	465	20	60	120	300	460	465	465	465
Season	Winter	302	375.1	118.5	6.8	5	695	150	330	395	440	495	550	612	640
Season	Spring	287	353.4	133.7	7.9	10	840	90	290	390	430	475	500	570	710
Season	Summer	125	332.4	142.1	12.7	40	630	70	217	375	425	470	550	600	600
Season	Fall	170	357.0	132.8	10.2	1	785	120	285	380	430	510	565	605	645
Asthma	No	784	358.0	130.7	4.7	1	840	95	295	390	435	485	550	595	630
Asthma	Yes	96	363.0	127.9	13.1	20	695	95	334	390	428	475	540	645	695
Asthma	DK	4	363.8	162.6	81.3	120	450	120	280	443	448	450	450	450	450
Angina	No	875	358.6	130.5	4.4	1	840	95	300	390	435	483	550	600	640
Angina	Yes	4	382.5	87.7	43.9	255	455	255	330	410	435	455	455	455	455
Angina	DK	5	333.6	140.5	62.8	120	460	120	270	378	440	460	460	460	460
Bronchitis/Emphysema	No	851	359.1	130.4	4.5	1	840	95	300	390	435	485	550	600	640
Bronchitis/Emphysema	Yes	27	340.1	132.7	25.5	30	605	60	305	365	435	450	460	605	605
Bronchitis/Emphysema	DK	6	357.2	121.5	49.6	120	440	120	350	397	440	440	440	440	440

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Indoor Playing

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		188	105.0	82.7	6.0	2	510	20	55	90	128	190	270	390	435
Gender	Male	65	117.0	97.1	12.0	10	510	20	60	90	135	255	300	435	510
Gender	Female	123	99.5	73.8	6.7	2	420	20	55	76	120	190	225	340	375
Age (years)	-	3	127.0	47.3	27.3	90	180	90	90	110	180	180	180	180	180
Age (years)	1 to 4	11	130.0	80.2	24.2	15	270	15	60	115	180	255	270	270	270
Age (years)	5 to 11	11	93.6	64.3	19.4	30	195	30	30	60	175	180	195	195	195
Age (years)	12 to 17	4	82.5	45.0	22.5	30	120	30	45	90	120	120	120	120	120
Age (years)	18 to 64	149	103.0	86.0	7.1	2	510	20	55	76	120	190	292	420	435
Age (years)	> 64	10	124.0	76.4	24.2	20	270	20	75	100	150	248	270	270	270
Race	White	153	110.0	84.3	6.8	2	510	20	60	90	130	190	270	390	435
Race	Black	13	95.0	84.8	23.5	15	255	15	30	60	180	220	255	255	255
Race	Asian	5	71.0	56.8	25.4	10	150	10	30	60	105	150	150	150	150
Race	Some Others	7	108.0	96.5	36.5	30	300	30	55	60	175	300	300	300	300
Race	Hispanic	8	68.4	46.4	16.4	42	180	42	45	50	68	180	180	180	180
Race	Refused	2	64.0	65.1	46.0	18	110	18	18	64	110	110	110	110	110
Hispanic	No	172	107.0	83.9	6.4	2	510	20	60	90	133	190	270	390	435
Hispanic	Yes	15	88.1	71.4	18.4	42	300	42	45	60	100	180	300	300	300
Hispanic	Refused	1	110.0	-	-	110	110	110	110	110	110	110	110	110	110
Employment	-	26	108.0	69.9	13.7	15	270	30	55	105	160	195	255	270	270
Employment	Full Time	74	102.0	95.0	11.0	2	510	15	45	70	125	195	300	435	510
Employment	Part Time	20	124.0	74.0	16.6	30	340	36	60	120	165	200	280	340	340
Employment	Not Employed	68	102.0	76.0	9.2	15	420	30	60	85	120	180	245	390	420
Education	-	27	108.0	68.6	13.2	15	270	30	55	110	160	195	255	270	270
Education	< High School	16	89.4	58.8	14.7	20	220	20	53	60	125	180	220	220	220
Education	High School Graduate	59	102.0	83.6	10.9	2	435	20	55	75	135	180	340	375	435
Education	< College	33	112.0	97.7	17.0	10	510	20	55	90	120	190	300	510	510
Education	College Graduate	37	125.0	96.1	15.8	15	420	15	60	105	155	270	390	420	420
Education	Post Graduate	16	72.5	40.4	10.1	10	150	10	38	65	103	120	150	150	150
Census Region	Northeast	46	110.0	94.4	13.9	2	420	20	60	75	120	245	375	420	420
Census Region	Midwest	40	111.0	75.8	12.0	15	340	18	50	95	175	193	256	340	340
Census Region	South	64	100.0	73.0	9.1	10	435	30	53	88	128	180	225	270	435
Census Region	West	38	102.0	92.2	15.0	10	510	18	60	60	120	180	300	510	510
Day Of Week	Weekday	128	99.4	71.0	6.3	2	435	20	55	90	120	180	245	300	340
Day Of Week	Weekend	60	118.0	13.0	13.3	15	510	30	60	90	150	245	383	420	510
Season	Winter	49	130.0	99.2	14.2	18	420	20	60	105	180	300	375	420	420
Season	Spring	36	85.7	55.7	9.3	2	270	20	45	78	113	155	180	270	270
Season	Summer	47	92.7	77.0	11.2	10	435	30	45	60	120	180	195	435	435
Season	Fall	56	107.0	82.7	11.0	10	510	15	60	90	128	195	255	270	510
Asthma	No	174	107.0	84.1	6.4	2	510	20	55	90	130	190	270	390	435
Asthma	Yes	13	88.5	66.4	18.4	20	245	20	30	75	120	180	245	245	245
Asthma	DK	1	110.0	-	-	110	110	110	110	110	110	110	110	110	110
Angina	No	184	104.0	80.7	6.0	2	510	20	55	90	123	190	270	375	435
Angina	Yes	3	210.0	167.0	96.4	60	390	60	60	180	390	390	390	390	390
Angina	DK	1	110.0	-	-	110	110	110	110	110	110	110	110	110	110
Bronchitis/emphysema	No	177	107.0	83.5	6.3	2	510	20	60	90	130	190	270	390	435
Bronchitis/emphysema	Yes	10	80.1	72.5	22.9	10	245	10	30	60	76	208	245	245	245
Bronchitis/emphysema	DK	1	110.0	-	-	110	110	110	110	110	110	110	110	110	110

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Traveling on a Bicycle/Skate Board/Rollerskate

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		115	45.1	53.4	5.1	1	400	5	11	30	60	102	151	195	205
Gender	Male	82	43.2	56.1	6.2	1	400	5	10	28	50	90	120	195	400
Gender	Female	33	49.9	46.2	8.0	5	205	5	15	45	60	105	165	205	205
Age (years)	-	2	15.0	7.1	5.0	10	20	10	10	15	20	20	20	20	20
Age (years)	1 to 4	2	20.0	14.1	10.0	10	30	10	10	20	30	30	30	30	30
Age (years)	5 to 11	18	40.3	53.0	12.5	1	195	1	10	15	55	151	195	195	195
Age (years)	12 to 17	33	32.0	27.9	4.9	2	115	5	10	25	45	65	102	115	115
Age (years)	18 to 64	53	53.2	62.9	8.6	5	400	5	20	30	65	105	165	180	400
Age (years)	> 64	7	74.0	67.3	25.4	23	205	23	25	35	110	205	205	205	205
Race	White	98	46.7	56.9	5.7	1	400	5	11	30	60	110	165	205	400
Race	Black	7	41.1	21.7	8.2	5	65	5	25	50	60	65	65	65	65
Race	Asian	2	6.0	1.4	1.0	5	7	5	5	6	7	7	7	7	7
Race	Some Others	4	47.5	23.6	11.8	30	80	30	30	40	65	80	80	80	80
Race	Hispanic	3	33.3	25.2	14.5	10	60	10	10	30	60	60	60	60	60
Race	Refused	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Hispanic	No	106	45.9	55.2	5.4	1	400	5	10	30	60	105	151	195	205
Hispanic	Yes	8	38.4	23.3	8.2	10	80	10	24	30	55	80	80	80	80
Hispanic	Refused	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Employment	-	52	33.8	38.3	5.3	1	195	2	10	20	48	65	115	151	195
Employment	Full Time	27	56.9	76.9	14.8	5	400	5	15	30	60	115	120	400	400
Employment	Part Time	7	40.9	24.8	9.4	10	90	10	30	35	46	90	90	90	90
Employment	Not Employed	27	55.5	54.3	10.4	5	205	5	20	30	90	165	180	205	205
Employment	Refused	2	55.0	49.5	35.0	20	90	20	20	55	90	90	90	90	90
Education	-	56	33.4	36.9	4.9	1	195	2	10	20	45	65	115	151	195
Education	< High School	3	98.3	77.8	44.9	25	180	25	25	90	180	180	180	180	180
Education	High School Graduate	18	41.6	49.0	11.6	5	205	5	15	30	46	100	205	205	205
Education	< College	18	42.9	35.0	8.3	5	120	5	20	30	60	115	120	120	120
Education	College Graduate	11	89.8	111.3	33.6	15	400	15	25	53	90	165	400	400	400
Education	Post Graduate	9	57.2	38.4	12.8	5	110	5	20	60	90	110	110	110	110
Census Region	Northeast	20	42.1	35.1	7.8	5	102	5	10	33	78	95	101	102	102
Census Region	Midwest	24	39.1	47.5	9.7	2	180	5	10	19	58	90	165	180	180
Census Region	South	26	64.7	87.0	17.1	1	400	2	15	33	75	195	205	400	400
Census Region	West	45	38.4	32.6	4.9	5	151	5	18	30	50	80	115	151	151
Day Of Week	Weekday	83	44.6	56.0	6.2	5	400	5	15	30	60	90	151	205	400
Day Of Week	Weekend	32	46.5	46.5	8.2	1	195	2	10	33	75	110	120	195	195
Season	Winter	20	38.6	45.0	10.1	1	205	4	13	28	48	75	148	205	205
Season	Spring	46	34.8	35.0	5.2	5	195	5	10	23	46	80	90	195	195
Season	Summer	34	61.7	72.2	12.4	2	400	5	20	43	90	115	165	400	400
Season	Fall	15	47.9	55.7	14.4	2	180	2	10	20	75	151	180	180	180
Asthma	No	95	48.5	57.2	5.9	1	400	5	15	30	60	110	165	205	400
Asthma	Yes	18	29.3	24.2	5.7	5	90	5	7	33	40	60	90	90	90
Asthma	DK	2	25.0	7.1	5.0	20	30	20	20	25	30	30	30	30	30
Angina	No	114	45.3	53.5	5.0	1	400	5	11	30	60	102	151	195	205
Angina	DK	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Bronchitis/Emphysema	No	109	45.1	53.9	5.2	1	400	5	15	30	60	102	151	195	205
Bronchitis/Emphysema	Yes	5	50.0	49.6	22.2	5	115	5	10	30	90	115	115	115	115
Bronchitis/Emphysema	DK	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Outdoor Recreation

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		253	211.2	185.5	11.7	5	1,440	20	60	165	300	480	574	670	690
Sex	Male	140	231.8	207.4	17.5	5	1,440	18	68	177	330	503	600	690	735
Sex	Female	112	183.7	150.2	14.2	5	645	20	60	150	255	380	525	585	630
Sex	Refused	1	420.0	-	-	420	420	420	420	420	420	420	420	420	420
Age (years)	-	2	337.5	201.5	142.5	195	480	195	195	338	480	480	480	480	480
Age (years)	1 to 4	13	166.5	177.1	49.1	15	630	15	30	130	180	370	630	630	630
Age (years)	5 to 11	21	206.1	156.2	34.1	30	585	60	90	165	245	360	574	585	585
Age (years)	12 to 17	27	155.1	128.3	24.7	5	465	5	60	135	225	420	420	465	465
Age (years)	18 to 64	158	223.6	193.0	15.4	5	1,440	30	80	173	310	505	585	690	690
Age (years)	>64	32	211.1	206.6	36.5	5	735	5	30	171	375	495	600	735	735
Race	White	225	209.8	182.7	12.2	5	1,440	20	60	165	300	460	570	670	690
Race	Black	16	233.9	231.3	57.8	5	690	5	43	150	450	585	690	690	690
Race	Asian	3	203.3	262.2	151.4	30	505	30	30	75	505	505	505	505	505
Race	Some Others	2	327.5	130.8	92.5	235	420	235	235	328	420	420	420	420	420
Race	Hispanic	4	77.5	53.9	27.0	20	150	20	43	70	113	150	150	150	150
Race	Refused	3	308.3	209.4	120.9	180	550	180	180	195	550	550	550	550	550
Hispanic	No	238	211.8	187.1	12.1	5	1,440	20	60	165	300	480	585	690	690
Hispanic	Yes	12	175.5	149.1	43.0	15	511	15	70	150	255	340	511	511	511
Hispanic	Refused	3	308.3	209.4	120.9	180	550	180	180	195	550	550	550	550	550
Employment	-	60	177.1	150.0	19.4	5	630	13	60	148	230	395	520	585	630
Employment	Full Time	104	210.7	153.4	15.0	5	670	30	83	180	294	419	511	600	645
Employment	Part Time	19	205.3	204.0	46.8	30	690	30	60	150	180	570	690	690	690
Employment	Not Employed	68	244.4	245.0	29.7	5	1,440	15	60	180	375	525	690	735	1,440
Employment	Refused	2	187.5	10.6	7.5	180	195	180	180	188	195	195	195	195	195
Education	-	64	176.7	145.3	18.2	5	630	15	60	153	225	370	465	585	630
Education	< High School	22	259.4	178.0	37.9	5	600	30	105	248	380	525	600	600	600
Education	High School Graduate	59	238.2	229.0	29.8	15	1,440	20	90	175	310	511	670	690	1,440
Education	< College	54	218.1	172.2	23.4	5	690	25	65	173	345	460	550	570	690
Education	College Graduate	31	224.7	193.1	34.7	20	690	30	60	150	325	505	645	690	690
Education	Post Graduate	23	157.6	178.2	37.2	5	735	10	50	80	200	370	480	735	735
Census Region	Northeast	52	189.6	160.9	22.3	5	690	30	60	163	232	370	574	670	690
Census Region	Midwest	54	212.1	228.4	31.1	5	1,440	20	60	178	280	419	600	735	1,440
Census Region	South	84	217.3	175.3	19.1	5	645	15	63	150	348	495	525	600	645
Census Region	West	63	220.3	179.7	22.6	10	690	30	75	165	280	545	585	690	690
Day Of Week	Weekday	129	197.2	195.3	17.2	5	1,440	15	60	150	275	465	525	670	735
Day Of Week	Weekend	124	225.8	174.3	15.6	5	690	20	85	180	310	480	600	690	690
Season	Winter	31	196.6	165.5	29.7	5	585	5	60	165	280	440	550	585	585
Season	Spring	75	198.9	161.7	18.7	5	690	25	75	180	270	465	545	670	690
Season	Summer	102	228.2	204.2	20.2	5	1,440	30	75	180	325	459	585	690	690
Season	Fall	45	203.5	193.8	28.9	5	735	20	60	120	330	505	574	735	735
Asthma	No	232	208.2	187.7	12.3	5	1,440	20	60	159	294	480	585	690	690
Asthma	Yes	19	250.2	166.6	38.2	15	570	15	80	255	350	525	570	570	570
Asthma	DK	2	187.5	10.6	7.5	180	195	180	180	188	195	195	195	195	195
Angina	No	245	206.8	184.9	11.8	5	1,440	20	60	160	288	480	570	670	690
Angina	Yes	6	399.2	151.2	61.7	285	690	285	310	345	420	690	690	690	690
Angina	DK	2	187.5	10.6	7.5	180	195	180	180	188	195	195	195	195	195
Bronchitis/Emphysema	No	238	212.2	189.2	12.3	5	1,440	20	60	165	300	495	585	690	690
Bronchitis/Emphysema	Yes	13	196.3	122.2	33.9	5	370	5	117	160	310	340	370	370	370
Bronchitis/Emphysema	DK	2	187.5	10.6	7.5	180	195	180	180	188	195	195	195	195	195

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Active Sport

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1,384	124.0	112.8	3.0	1	1,130	15	50	90	165	267	330	435	525
Sex	Male	753	136.8	120.8	4.4	1	1,130	20	60	105	180	285	375	500	558
Sex	Female	629	108.6	100.6	4.0	1	1,065	15	38	75	150	240	300	370	435
Sex	Refused	2	142.5	38.9	27.5	115	170	115	115	143	170	170	170	170	170
Age (years)	-	23	108.7	78.6	16.4	5	290	30	40	90	155	220	225	290	290
Age (years)	1 to 4	105	115.8	98.9	9.6	10	630	30	45	90	159	250	330	345	390
Age (years)	5 to 11	247	148.9	126.6	8.1	2	975	20	60	120	188	320	390	510	558
Age (years)	12 to 17	215	137.5	124.5	8.5	5	1,065	15	60	110	180	265	375	470	520
Age (years)	18 to 64	642	120.3	110.4	4.4	1	1,130	15	45	90	160	250	330	450	525
Age (years)	>64	152	88.0	80.2	6.5	1	380	15	30	60	120	220	285	315	330
Race	White	1,139	126.0	116.2	3.4	1	1,130	15	50	90	165	270	340	452	530
Race	Black	109	113.4	96.8	9.3	5	440	10	45	86	150	240	332	430	435
Race	Asian	30	89.9	79.2	14.5	5	310	10	30	60	145	215	235	310	310
Race	Some Others	35	135.4	112.2	19.0	15	553	20	60	105	195	270	330	553	553
Race	Hispanic	59	116.3	91.3	11.9	1	520	15	45	115	145	240	305	345	520
Race	Refused	12	120.0	86.6	25.0	40	300	40	60	95	130	290	300	300	300
Hispanic	No	1,250	124.5	113.5	3.2	1	1,130	15	45	90	165	270	330	435	515
Hispanic	Yes	120	121.2	110.8	10.1	1	630	15	50	90	148	240	335	520	553
Hispanic	DK	4	113.8	57.5	28.8	60	185	60	68	105	160	185	185	185	185
Hispanic	Refused	10	102.0	72.1	22.8	40	290	40	60	83	105	215	290	290	290
Employment	-	561	137.1	120.8	5.1	2	1,065	20	60	110	180	285	370	452	558
Employment	Full Time	375	117.6	107.3	5.5	5	1,130	20	45	90	155	240	305	380	525
Employment	Part Time	87	116.2	87.6	9.4	1	450	15	60	95	160	235	285	355	450
Employment	Not Employed	352	112.5	110.0	5.9	1	600	10	30	70	150	270	330	475	520
Employment	Refused	9	99.4	77.2	25.7	30	280	30	45	90	120	280	280	280	280
Education	-	610	137.7	121.2	4.9	2	1,065	20	60	110	180	285	370	470	558
Education	< High School	86	101.0	99.7	10.8	10	570	15	30	60	135	225	270	510	570
Education	High School Graduate	233	116.8	116.8	7.7	1	1,130	20	45	85	150	240	300	420	530
Education	< College	178	115.8	100.3	7.5	1	525	15	45	90	160	270	340	418	475
Education	College Graduate	165	116.2	97.9	7.6	1	600	15	50	90	150	250	310	380	450
Education	Post Graduate	112	106.4	97.9	9.2	5	375	10	40	60	143	270	330	360	375
Census Region	Northeast	333	132.0	129.1	7.1	1	1,130	15	60	100	170	275	345	485	558
Census Region	Midwest	254	116.9	101.9	6.4	5	570	18	45	90	150	255	315	430	440
Census Region	South	479	119.5	108.7	5.0	1	975	15	45	90	160	265	330	410	462
Census Region	West	318	128.1	108.8	6.1	1	625	25	55	93	175	295	330	500	525
Day Of Week	Weekday	902	115.5	97.8	3.3	1	650	15	45	90	150	240	300	395	485
Day Of Week	Weekend	482	139.9	135.2	6.2	1	1,130	20	59	100	180	300	380	500	565
Season	Winter	316	115.6	115.2	6.5	1	1,065	15	45	85	155	240	305	370	475
Season	Spring	423	130.8	105.0	5.1	5	650	30	60	105	175	270	330	435	515
Season	Summer	425	129.5	115.1	5.6	1	625	15	45	95	178	290	375	462	530
Season	Fall	220	112.3	118.3	8.0	1	1,130	15	43	78	144	240	290	460	565
Asthma	No	1,266	122.5	109.6	3.1	1	1,130	15	45	90	162	266	330	430	515
Asthma	Yes	105	144.8	145.8	14.2	1	1,065	15	60	110	180	300	390	553	565
Asthma	DK	13	105.0	110.4	30.6	30	450	30	60	60	90	165	450	450	450
Angina	No	1,343	125.5	113.6	3.1	1	1,130	15	50	90	165	270	332	440	525
Angina	Yes	33	72.1	74.0	12.9	5	330	5	30	50	60	180	275	330	330
Angina	DK	8	86.9	41.1	14.5	40	155	40	60	75	115	155	155	155	155
Bronchitis/Emphysema	No	1,331	124.1	113.2	3.1	1	1,130	15	50	90	165	267	330	435	520
Bronchitis/Emphysema	Yes	43	130.0	112.7	17.2	10	553	30	45	110	165	270	340	553	553
Bronchitis/Emphysema	DK	10	84.0	39.8	12.6	40	155	40	60	75	105	148	155	155	155

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Exercise

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		564	77.4	70.4	3.0	4	670	15	30	60	100	150	195	275	420
Sex	Male	262	84.7	75.8	4.7	5	670	20	30	60	117	165	205	285	450
Sex	Female	302	71.1	64.9	3.7	4	525	15	30	60	90	125	175	265	360
Age (years)	-	10	76.5	74.0	23.4	15	270	15	30	60	90	188	270	270	270
Age (years)	1 to 4	11	127.3	187.2	56.4	15	670	15	30	60	150	160	670	670	670
Age (years)	5 to 11	26	132.5	126.3	24.8	15	525	25	60	90	180	275	450	525	525
Age (years)	12 to 17	35	67.8	41.6	7.0	15	180	20	30	60	100	120	150	180	180
Age (years)	18 to 64	407	77.6	63.6	3.2	4	480	20	30	60	100	145	185	265	300
Age (years)	>64	75	54.9	44.5	5.1	6	195	10	25	40	70	120	150	193	195
Race	White	480	78.0	71.5	3.3	4	670	15	30	60	100	150	194	285	450
Race	Black	34	74.7	44.7	7.7	15	250	15	45	60	105	120	130	250	250
Race	Asian	10	46.3	25.0	7.9	15	95	15	30	42	60	83	95	95	95
Race	Some Others	14	80.2	73.9	19.8	30	275	30	30	48	90	179	275	275	275
Race	Hispanic	19	63.0	60.7	13.9	15	265	15	30	45	60	160	265	265	265
Race	Refused	7	128.6	130.5	49.3	30	360	30	55	60	270	360	360	360	360
Hispanic	No	516	76.9	70.1	3.1	4	670	15	30	60	99	145	193	275	420
Hispanic	Yes	38	76.6	59.5	9.7	15	265	20	30	60	110	160	250	265	265
Hispanic	DK	3	65.0	69.5	40.1	20	145	20	20	30	145	145	145	145	145
Hispanic	Refused	7	128.6	130.5	49.3	30	360	30	55	60	270	360	360	360	360
Employment	-	72	99.0	111.6	13.2	15	670	20	30	60	120	180	275	525	670
Employment	Full Time	300	72.7	55.6	3.2	5	460	20	30	60	90	130	180	240	291
Employment	Part Time	50	86.0	83.6	11.8	10	420	20	30	60	92	168	300	390	420
Employment	Not Employed	139	72.7	63.4	5.4	4	480	10	30	60	90	135	195	240	265
Employment	Refused	3	113.3	135.8	78.4	30	270	30	30	40	270	270	270	270	270
Education	-	83	102.0	111.0	12.2	15	670	25	30	60	120	205	275	525	670
Education	< High School	21	58.2	66.1	14.4	10	300	10	28	30	60	90	165	300	300
Education	High School Graduate	124	81.0	63.0	5.7	4	298	15	30	60	115	179	205	250	265
Education	< College	104	80.9	70.2	6.9	15	480	20	30	60	113	150	170	240	420
Education	College Graduate	110	73.6	62.5	6.0	5	460	20	30	60	98	130	180	285	297
Education	Post Graduate	122	60.9	38.4	3.5	5	240	15	30	60	80	110	127	165	185
Census Region	Northeast	130	88.4	77.6	6.8	10	450	15	30	60	120	200	240	297	420
Census Region	Midwest	101	63.6	44.3	4.4	10	300	15	30	60	89	115	120	170	215
Census Region	South	177	75.3	71.6	5.4	5	525	15	30	60	90	150	185	298	480
Census Region	West	156	79.6	75.3	6.0	4	670	20	30	60	104	130	183	270	460
Day Of Week	Weekday	426	73.1	63.9	3.1	4	670	15	30	60	90	130	180	240	298
Day Of Week	Weekend	138	90.8	86.6	7.4	6	525	15	30	60	120	200	265	420	460
Season	Winter	150	67.4	49.9	4.1	8	285	15	30	60	90	128	175	213	240
Season	Spring	140	74.9	55.4	4.7	10	360	18	30	60	90	148	181	220	298
Season	Summer	192	93.2	91.3	6.6	5	670	20	30	63	120	180	250	450	525
Season	Fall	82	63.3	63.3	7.0	4	460	15	30	45	75	120	135	300	460
Asthma	No	523	76.6	70.2	3.1	4	670	15	30	60	100	150	185	265	420
Asthma	Yes	37	78.2	51.5	8.5	20	275	20	45	65	100	120	200	275	275
Asthma	DK	4	175.0	167.0	83.5	10	360	10	35	165	315	360	360	360	360
Angina	No	553	77.3	69.4	2.9	4	670	15	30	60	100	145	193	265	420
Angina	Yes	7	27.3	19.6	7.4	6	60	6	10	25	45	60	60	60	60
Angina	DK	4	188.8	150.4	75.2	60	360	60	63	168	315	360	360	360	360
Bronchitis/Emphysema	No	542	77.1	69.5	3.0	4	670	15	30	60	100	145	185	265	420
Bronchitis/Emphysema	Yes	17	64.6	60.6	14.7	10	275	10	30	50	63	120	275	275	275
Bronchitis/Emphysema	DK	5	157.0	149.6	66.9	15	360	15	60	80	270	360	360	360	360

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Walking

Category	Population Group	*N*	Mean	SD	SE	Min	Max	Percentiles							
								5	25	50	75	90	95	98	99
All		1,639	29.7	41.6	1.0	1	540	2	6	16	39	65	95	151	190
Sex	Male	755	32.5	48.3	1.8	1	540	2	7	20	40	70	100	170	270
Sex	Female	883	27.3	34.8	1.2	1	360	2	6	15	35	60	94	140	171
Sex	Refused	1	20.0	-	-	20	20	20	20	20	20	20	20	20	20
Age (years)	-	38	29.5	23.7	3.9	1	100	2	10	25	40	60	80	100	100
Age (years)	1 to 4	58	24.3	26.3	3.5	1	160	2	10	15	35	60	60	70	160
Age (years)	5 to 11	155	18.2	21.0	1.7	1	170	1	5	10	25	40	60	65	100
Age (years)	12 to 17	223	25.8	32.4	2.2	1	190	2	6	15	30	60	100	135	151
Age (years)	18 to 64	944	31.8	45.0	1.5	1	410	2	6	19	40	70	110	171	250
Age (years)	>64	221	33.8	49.3	3.3	1	540	2	10	20	45	73	95	155	180
Race	White	1,289	29.6	43.7	1.2	1	540	2	6	15	35	65	100	160	225
Race	Black	175	34.8	39.7	3.0	1	250	2	10	20	50	75	125	160	194
Race	Asian	36	26.6	24.7	4.1	1	100	1	10	20	30	60	78	100	100
Race	Some Others	30	23.8	21.2	3.9	1	60	1	6	17	43	60	60	60	60
Race	Hispanic	88	23.1	21.1	2.2	1	100	2	6	15	37	50	60	92	100
Race	Refused	21	33.2	33.0	7.2	4	150	8	15	20	40	65	65	150	150
Hispanic	No	1,467	29.9	41.0	1.1	1	410	2	6	16	40	65	100	155	194
Hispanic	Yes	144	26.8	48.7	4.1	1	540	2	6	15	35	60	70	100	135
Hispanic	DK	10	30.2	28.8	9.1	2	80	2	10	18	55	78	80	80	80
Hispanic	Refused	18	35.7	34.8	8.2	8	150	8	15	25	55	65	150	150	150
Employment	-	431	22.8	28.0	1.3	1	190	2	5	13	30	55	65	131	151
Employment	Full Time	561	31.0	43.8	1.8	1	365	2	7	16	40	70	100	180	250
Employment	Part Time	153	26.9	37.1	3.0	1	295	2	5	15	35	60	92	135	165
Employment	Not Employed	482	35.5	49.4	2.3	1	540	2	10	20	50	75	120	150	250
Employment	Refused	12	18.4	13.5	3.9	5	55	5	10	17	20	30	55	55	55
Education	-	472	22.7	27.6	1.3	1	190	2	5	13	30	55	65	130	151
Education	< High School	138	42.7	71.9	6.1	1	540	3	7	20	50	115	145	360	365
Education	High School Graduate	366	29.3	41.6	2.2	1	410	2	5	18	35	65	100	150	240
Education	< College	288	32.5	39.3	2.3	1	295	2	10	20	45	75	100	160	180
Education	College Graduate	210	29.8	38.8	2.7	1	300	2	8	19	40	60	90	140	225
Education	Post Graduate	165	34.6	44.6	3.5	1	360	2	10	20	45	80	95	180	200
Census Region	Northeast	507	34.9	45.3	2.0	1	365	2	10	20	45	75	107	170	250
Census Region	Midwest	321	29.3	46.9	2.6	1	540	2	6	15	31	60	105	160	180
Census Region	South	423	25.0	37.7	1.8	1	410	2	5	10	30	60	80	135	171
Census Region	West	388	28.2	35.0	1.8	1	285	2	8	15	40	60	90	140	180
Day Of Week	Weekday	1,182	29.3	39.2	1.1	1	540	2	7	18	40	65	92	145	180
Day Of Week	Weekend	457	30.7	47.4	2.2	1	410	2	5	15	35	60	120	171	200
Season	Winter	412	32.3	47.7	2.4	1	365	2	6	20	39	75	120	180	250
Season	Spring	459	28.9	41.5	1.9	1	540	2	6	16	35	60	90	146	180
Season	Summer	475	26.6	31.3	1.4	1	270	2	6	15	35	60	85	123	160
Season	Fall	293	32.2	46.7	2.7	1	410	2	8	20	45	61	105	155	295
Asthma	No	1,504	29.6	42.0	1.1	1	540	2	6	16	36	65	95	152	190
Asthma	Yes	120	29.7	38.3	3.5	1	250	2	5	15	40	70	118	135	150
Asthma	DK	15	36.2	27.8	7.2	5	90	5	10	30	60	75	90	90	90
Angina	No	1,578	29.5	41.5	1.0	1	540	2	6	16	38	65	95	151	190
Angina	Yes	44	29.0	36.1	5.4	2	150	4	6	15	36	60	115	150	150
Angina	DK	17	46.6	63.1	15.3	5	270	5	10	30	60	90	270	270	270
Bronchitis/Emphysema	No	1,553	29.7	42.1	1.1	1	540	2	6	16	38	65	95	151	194
Bronchitis/Emphysema	Yes	67	27.0	31.9	3.9	1	165	2	5	16	40	60	90	130	165
Bronchitis/Emphysema	DK	19	35.4	31.4	7.2	3	110	3	10	30	60	90	110	110	110

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Housekeeping[a]

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1,943	118.8	113.4	2.6	1	810	10	40	90	165	270	345	465	540
Sex	Male	370	109.4	116.5	6.1	1	810	10	30	60	150	270	360	425	560
Sex	Female	1,573	121.0	112.5	2.8	1	790	15	45	90	165	270	345	465	540
Age (years)	-	47	146.0	121.3	17.7	10	480	10	45	115	240	300	375	480	480
Age (years)	1 to 4	11	74.1	69.4	20.9	10	270	10	40	60	90	90	270	270	270
Age (years)	5 to 11	54	42.9	34.1	4.6	1	180	5	20	30	53	80	120	150	180
Age (years)	12 to 17	72	78.1	75.5	8.9	1	300	5	28	60	105	210	240	285	300
Age (years)	18 to 64	1,316	120.4	113.7	3.1	1	810	15	40	90	165	270	360	465	525
Age (years)	>64	443	128.2	118.9	5.7	3	790	10	55	90	180	270	345	540	570
Race	White	1,649	119.1	112.2	2.8	1	790	10	40	90	165	265	340	465	540
Race	Black	137	116.6	109.4	9.3	1	490	5	30	90	150	300	358	480	484
Race	Asian	32	98.8	100.5	17.8	15	425	15	30	60	128	265	345	425	425
Race	Some Others	26	82.4	56.4	11.1	5	210	15	40	60	115	185	190	210	210
Race	Hispanic	71	112.6	129.3	15.3	5	660	8	30	60	135	270	465	518	660
Race	Refused	28	189.3	176.2	33.3	10	810	20	53	148	248	420	465	810	810
Hispanic	No	1,771	117.4	110.6	2.6	1	790	10	40	90	165	265	335	425	525
Hispanic	Yes	134	121.7	129.6	11.2	5	660	10	35	85	135	270	470	540	658
Hispanic	DK	15	146.9	127.9	33.0	10	510	10	30	120	210	240	510	510	510
Hispanic	Refused	23	191.1	180.3	37.6	10	810	20	45	150	255	390	420	810	810
Employment	-	138	65.6	68.8	5.9	1	375	5	25	45	80	180	240	285	300
Employment	Full Time	673	106.6	102.4	3.9	1	655	10	30	70	145	240	325	413	490
Employment	Part Time	193	124.7	117.5	8.5	1	660	15	45	90	180	270	390	480	540
Employment	Not Employed	925	132.7	119.4	3.9	3	790	15	55	105	180	295	370	484	600
Employment	Refused	14	236.8	208.2	55.6	10	810	10	120	183	300	430	810	810	810
Education	-	171	82.2	96.9	7.4	1	810	5	30	45	105	220	270	300	375
Education	< High School	246	140.7	125.4	8.0	3	715	10	60	120	180	300	400	540	660
Education	High School Graduate	677	125.1	120.5	4.6	2	790	15	45	90	175	270	375	490	610
Education	< College	433	112.9	100.1	4.8	1	570	10	40	90	150	240	320	420	470
Education	College Graduate	245	107.3	102.2	6.5	1	585	15	30	60	150	240	328	405	465
Education	Post Graduate	171	130.8	118.0	9.0	5	655	15	60	90	180	280	390	495	540
Census Region	Northeast	464	119.2	116.4	5.4	2	790	10	35	90	165	245	330	480	655
Census Region	Midwest	413	117.9	112.6	5.5	1	715	10	34	88	165	255	345	480	525
Census Region	South	648	119.9	116.2	4.6	1	810	10	40	90	165	285	370	435	540
Census Region	West	418	117.7	106.6	5.2	5	720	15	40	90	165	255	340	420	470
Day Of Week	Weekday	1,316	113.2	111.9	3.1	1	790	10	30	75	150	255	330	470	550
Day Of Week	Weekend	627	130.6	115.6	4.6	1	810	15	55	90	180	290	370	435	525
Season	Winter	470	111.4	100.6	4.6	1	810	10	45	85	160	240	290	390	480
Season	Spring	451	122.6	114.0	5.4	3	720	15	40	90	180	270	360	465	540
Season	Summer	563	111.8	114.5	4.8	1	690	10	30	75	135	255	365	465	610
Season	Fall	459	131.3	122.4	5.7	1	790	15	45	90	180	300	390	480	560
Asthma	No	1,789	118.5	112.1	2.6	1	790	10	40	90	165	270	345	465	540
Asthma	Yes	140	115.7	115.8	9.8	5	690	10	37	67	150	278	378	470	480
Asthma	DK	14	189.3	208.6	55.7	10	810	10	45	123	255	340	810	810	810
Angina	No	1,853	117.7	112.3	2.6	1	790	13	40	90	160	265	345	465	540
Angina	Yes	75	122.9	103.8	12.0	5	394	5	30	90	210	270	320	370	394
Angina	DK	15	234.7	204.0	52.7	10	810	10	120	240	300	480	810	810	810
Bronchitis/Emphysema	No	1,816	118.1	112.9	2.7	1	790	10	40	90	160	270	355	465	540
Bronchitis/Emphysema	Yes	107	118.7	102.9	10.0	5	480	10	30	90	180	255	290	465	470
Bronchitis/Emphysema	DK	20	188.5	176.4	39.5	5	810	8	85	155	240	320	575	810	810

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Food Preparation

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		4278	52.4	52.9	0.8	1	555	5	20	35	65	115	150	210	265
Gender	Male	1342	37.8	42.1	1.2	1	480	5	13	30	50	80	105	150	210
Gender	Female	2936	59.0	55.9	1.0	1	555	5	25	45	75	120	155	224	272
Age (years)	-	94	52.0	43.2	4.5	5	215	5	20	40	60	110	150	195	215
Age (years)	1 to 4	24	56.5	60.4	12.3	5	240	5	23	30	75	150	180	240	240
Age (years)	5 to 11	60	25.2	29.7	3.8	1	120	2	5	11	30	60	107	120	120
Age (years)	12 to 17	131	21.7	37.7	3.3	1	385	2	5	10	30	55	70	90	90
Age (years)	18 to 64	3173	52.1	52.9	0.9	1	555	5	20	35	65	110	145	210	265
Age (years)	> 64	796	60.5	54.7	1.9	1	525	5	25	45	80	120	150	240	270
Race	White	3584	51.6	53.3	0.9	1	555	5	19	35	65	110	145	210	265
Race	Black	377	57.0	52.3	2.7	1	390	5	20	40	75	120	150	210	240
Race	Asian	62	54.0	41.8	5.3	2	210	5	20	50	70	105	130	175	210
Race	Some Others	66	50.6	53.2	6.6	1	295	5	15	34	70	115	150	210	295
Race	Hispanic	132	58.8	49.7	4.3	2	315	5	24	53	80	110	135	225	285
Race	Refused	57	53.1	49.3	6.5	2	210	5	20	40	60	120	180	195	210
Hispanic	No	3960	51.8	52.6	0.8	1	555	5	20	35	65	111	145	205	255
Hispanic	Yes	254	59.0	56.7	3.6	2	420	5	20	45	75	120	155	240	315
Hispanic	DK	20	55.0	53.2	11.9	6	240	8	25	45	60	113	180	240	240
Hispanic	Refused	44	58.6	53.3	8.0	2	210	5	28	38	80	150	180	210	210
Employment	-	210	27.2	40.5	2.8	1	385	2	5	15	30	60	90	120	180
Employment	Full Time	1988	45.5	46.7	1.0	1	480	5	15	30	60	90	130	180	240
Employment	Part Time	419	53.9	55.4	2.7	2	520	5	20	40	65	105	125	205	255
Employment	Not Employed	1626	63.6	57.7	1.4	1	555	5	29	45	90	125	170	240	275
Employment	Refused	35	53.5	66.8	11.3	2	340	2	20	30	60	120	195	340	340
Education	-	291	31.7	42.6	2.5	1	385	2	5	15	37	75	120	155	195
Education	< High School	450	61.3	53.2	2.5	1	555	5	30	45	90	120	150	197	225
Education	High School Graduate	1449	58.8	56.7	1.5	1	520	5	22	45	75	120	155	240	310
Education	< College	954	52.0	52.2	1.7	1	525	5	20	35	65	110	150	210	245
Education	College Graduate	659	46.2	48.1	1.9	1	515	5	15	30	60	100	125	180	224
Education	Post Graduate	475	46.0	48.7	2.2	1	375	5	15	30	60	95	135	200	270
Census Region	Northeast	953	52.3	53.2	1.7	1	480	5	20	40	60	110	140	205	255
Census Region	Midwest	956	53.2	51.8	1.7	1	520	5	20	35	65	120	150	210	265
Census Region	South	1452	53.4	53.5	1.4	1	555	5	16	35	70	120	150	195	245
Census Region	West	917	49.9	52.7	1.7	1	515	5	15	31	60	105	135	225	265
Day Of Week	Weekday	2995	50.1	50.0	0.9	1	555	5	19	35	60	105	132	180	240
Day Of Week	Weekend	1283	57.7	58.8	1.6	1	420	5	20	40	75	130	180	240	300
Season	Winter	1174	50.6	48.6	1.4	1	480	5	18	35	65	110	135	195	240
Season	Spring	1038	54.4	54.5	1.7	1	525	5	20	39	70	120	150	224	265
Season	Summer	1147	51.3	54.2	1.6	1	555	5	20	35	60	110	137	208	300
Season	Fall	919	53.5	54.5	1.8	1	520	5	20	37	67	120	155	200	265
Asthma	No	3948	52.0	53.2	0.8	1	555	5	20	35	65	110	145	210	265
Asthma	Yes	300	57.1	49.4	2.9	1	272	5	21	45	75	120	160	199	240
Asthma	DK	30	47.6	44.8	8.2	2	195	5	10	33	60	118	120	195	195
Angina	No	4091	52.2	53.0	0.8	1	555	5	20	35	65	115	150	210	265
Angina	Yes	149	56.8	48.2	4.0	1	340	5	25	45	80	120	135	180	210
Angina	DK	38	54.0	60.4	9.8	2	240	2	10	33	60	120	240	240	240
Bronchitis/Emphysema	No	4024	52.0	53.1	0.8	1	555	5	20	35	65	110	145	210	265
Bronchitis/Emphysema	Yes	216	56.9	46.7	3.2	3	240	5	20	45	85	120	150	198	210
Bronchitis/Emphysema	DK	38	62.4	61.7	10.0	2	240	2	20	43	90	150	240	240	240

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Food Cleanup

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1143	33.0	40.4	1.2	1	825	8	15	30	35	60	85	120	135
Gender	Male	204	27.5	20.4	1.4	1	180	10	15	25	30	50	60	80	85
Gender	Female	939	34.2	43.4	1.4	1	825	5	15	30	35	60	90	120	150
Age (years)	-	24	31.0	28.0	5.7	10	120	10	15	30	30	60	105	120	120
Age (years)	1 to 4	5	41.6	48.0	21.5	3	120	3	15	15	55	120	120	120	120
Age (years)	5 to 11	9	28.4	21.6	7.2	1	75	1	15	30	30	75	75	75	75
Age (years)	12 to 17	28	26.8	20.6	3.9	2	90	5	13	20	30	60	65	90	90
Age (years)	18 to 64	808	31.3	27.1	1.0	1	330	10	15	30	30	60	80	120	120
Age (years)	> 64	269	38.8	67.4	4.1	1	825	5	15	30	40	60	105	130	270
Race	White	976	33.0	41.7	1.3	1	825	8	15	30	35	60	84	120	130
Race	Black	82	33.3	28.6	3.2	5	180	10	15	30	30	65	90	120	180
Race	Asian	11	27.1	22.0	6.6	3	75	3	15	15	30	60	75	75	75
Race	Some Others	17	29.7	34.8	8.4	5	150	5	10	15	30	60	150	150	150
Race	Hispanic	42	35.6	39.9	6.2	3	255	10	15	30	40	50	60	255	255
Race	Refused	15	34.0	28.2	7.3	5	90	5	10	30	60	90	90	90	90
Hispanic	No	1057	32.7	40.4	1.2	1	825	5	15	30	35	60	85	120	130
Hispanic	Yes	68	38.9	44.9	5.4	3	270	10	15	30	40	60	120	255	270
Hispanic	DK	6	24.2	9.7	4.0	10	35	10	15	28	30	35	35	35	35
Hispanic	Refused	12	26.7	18.3	5.3	5	60	5	13	25	33	60	60	60	60
Employment	-	39	28.2	25.8	4.1	1	120	2	15	15	30	65	90	120	120
Employment	Full Time	432	28.4	22.7	1.1	2	255	8	15	25	30	50	60	90	120
Employment	Part Time	134	28.9	21.3	1.8	3	150	10	15	25	30	60	60	95	100
Employment	Not Employed	528	38.2	53.8	2.3	1	825	5	15	30	45	60	105	120	250
Employment	Refused	10	28.0	21.9	6.9	10	60	10	10	18	55	60	60	60	60
Education	-	59	27.3	23.0	3.0	1	120	3	10	20	30	60	75	90	120
Education	< High School	135	41.9	58.6	5.0	2	570	5	15	30	45	85	120	180	270
Education	High School Graduate	445	33.3	45.8	2.2	1	825	10	15	30	30	60	90	120	120
Education	< College	259	33.6	30.0	1.9	5	255	10	15	30	45	60	85	105	150
Education	College Graduate	142	27.7	21.8	1.8	1	180	10	15	23	30	50	60	90	120
Education	Post Graduate	103	28.9	34.5	3.4	3	330	5	15	25	30	50	60	60	120
Census Region	Northeast	295	32.6	28.3	1.7	3	270	5	15	30	40	60	90	120	120
Census Region	Midwest	252	28.5	22.7	1.4	1	210	5	15	30	30	50	60	85	120
Census Region	South	343	35.9	52.5	2.8	1	825	10	15	30	40	65	90	120	180
Census Region	West	253	34.0	46.5	2.9	3	570	10	15	27	30	60	75	120	255
Day Of Week	Weekday	782	32.2	43.6	1.6	1	825	8	15	30	30	60	75	120	120
Day Of Week	Weekend	361	34.7	32.4	1.7	5	270	8	15	30	40	60	90	120	180
Season	Winter	303	33.2	51.8	3.0	1	825	8	15	30	30	60	85	120	120
Season	Spring	245	30.3	26.1	1.7	2	250	10	15	30	30	60	65	105	120
Season	Summer	293	33.2	29.9	1.7	2	270	5	15	30	40	60	90	120	135
Season	Fall	302	34.9	45.4	2.6	1	570	8	15	30	40	60	90	120	180
Asthma	No	1047	32.8	40.4	1.2	1	825	6	15	30	35	60	85	120	120
Asthma	Yes	91	36.0	41.0	4.3	2	255	8	15	30	40	60	90	250	255
Asthma	DK	5	26.0	20.7	9.3	10	60	10	10	20	30	60	60	60	60
Angina	No	1092	33.0	41.0	1.2	1	825	8	15	30	35	60	85	120	150
Angina	Yes	45	32.3	22.9	3.4	5	120	5	15	30	45	60	60	120	120
Angina	DK	6	43.3	41.8	17.1	10	120	10	10	30	60	120	120	120	120
Bronchitis/Emphysema	No	1065	31.8	28.2	0.9	1	330	8	15	30	35	60	80	120	120
Bronchitis/Emphysema	Yes	71	50.9	118.4	14.1	3	825	5	15	29	35	70	105	570	825
Bronchitis/Emphysema	DK	7	38.1	41.1	15.5	2	120	2	10	30	60	120	120	120	120

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Cleaning House

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1910	114.8	111.7	2.6	1	810	10	30	80	150	255	335	465	525
Gender	Male	351	100.4	110.4	5.9	1	810	10	30	60	120	240	310	400	495
Gender	Female	1559	118.1	111.7	2.8	1	790	15	40	90	160	255	340	465	540
Age (years)	-	45	136.2	114.1	17.0	10	480	10	55	105	180	297	320	480	480
Age (years)	1 to 4	11	74.1	69.4	20.9	10	270	10	40	60	90	90	270	270	270
Age (years)	5 to 11	49	42.6	35.2	5.0	1	180	5	20	30	53	90	120	180	180
Age (years)	12 to 17	67	78.7	79.4	9.7	1	300	5	20	55	105	240	240	285	300
Age (years)	18 to 64	1307	115.6	111.6	3.1	1	810	15	30	85	150	270	350	435	510
Age (years)	> 64	431	125.1	118.3	5.7	3	790	10	45	90	170	250	340	540	570
Race	White	1614	115.9	111.3	2.8	1	790	10	35	85	155	255	330	435	540
Race	Black	139	108.7	106.8	9.1	1	490	5	30	80	135	270	358	480	484
Race	Asian	32	97.7	101.1	17.9	15	425	15	30	60	128	265	345	425	425
Race	Some Others	26	80.5	58.1	11.4	5	210	10	35	60	115	185	190	210	210
Race	Hispanic	73	99.8	110.7	13.0	5	548	10	30	60	120	210	345	470	548
Race	Refused	26	179.6	176.9	34.7	10	810	20	30	135	240	390	465	810	810
Hispanic	No	1740	114.2	110.0	2.6	1	790	10	30	80	150	255	330	435	525
Hispanic	Yes	134	110.1	115.8	10.0	5	658	10	34	60	135	240	360	480	548
Hispanic	DK	14	136.1	131.6	35.2	10	510	10	30	93	210	240	510	510	510
Hispanic	Refused	22	180.7	177.3	37.8	10	810	20	45	138	240	340	390	810	810
Employment	-	128	64.5	66.8	5.9	1	300	5	23	45	78	180	240	270	285
Employment	Full Time	673	100.9	99.9	3.8	1	655	10	30	60	120	240	310	410	480
Employment	Part Time	195	119.4	115.6	8.3	1	660	15	45	85	175	265	390	480	540
Employment	Not Employed	901	129.6	118.0	3.9	3	790	15	50	95	180	285	360	480	570
Employment	Refused	13	235.0	218.9	60.7	10	810	10	120	180	255	450	810	810	810
Education	-	161	81.4	98.1	7.7	1	810	5	28	45	100	225	265	300	375
Education	< High School	234	135.7	121.6	8.0	3	715	10	50	115	180	297	390	540	560
Education	High School Graduate	665	121.9	118.8	4.6	2	790	15	40	90	160	270	360	484	610
Education	< College	432	108.3	100.5	4.8	1	570	10	30	85	149	240	315	420	470
Education	College Graduate	247	101.1	96.6	6.1	1	525	15	30	60	127	240	315	390	465
Education	Post Graduate	171	126.1	118.9	9.1	5	655	15	45	90	180	280	390	495	540
Census Region	Northeast	454	117.0	117.3	5.5	2	790	10	30	90	164	240	330	480	655
Census Region	Midwest	406	114.1	111.0	5.5	1	720	10	30	80	150	240	325	475	495
Census Region	South	636	114.4	112.9	4.5	1	810	10	30	80	150	270	360	435	525
Census Region	West	414	113.8	104.2	5.1	5	720	15	40	83	160	240	330	400	470
Day Of Week	Weekday	1287	108.3	108.5	3.0	1	790	10	30	70	150	240	315	465	540
Day Of Week	Weekend	623	128.2	116.9	4.7	1	810	15	45	90	180	290	370	435	525
Season	Winter	464	105.6	98.3	4.6	1	810	10	30	75	150	240	285	360	465
Season	Spring	445	114.2	109.8	5.2	3	720	15	30	75	165	240	340	465	525
Season	Summer	546	109.9	113.7	4.9	1	690	10	30	71	135	245	365	465	548
Season	Fall	455	130.7	122.1	5.7	1	790	15	45	90	180	300	390	480	560
Asthma	No	1764	114.3	110.1	2.6	1	790	10	30	83	150	255	330	450	525
Asthma	Yes	133	114.7	117.5	10.2	5	690	10	33	64	150	270	390	470	480
Asthma	DK	13	180.8	214.5	59.5	10	810	10	45	120	240	340	810	810	810
Angina	No	1826	113.7	110.6	2.6	1	790	14	30	80	150	255	330	465	525
Angina	Yes	70	120.4	103.1	12.3	5	394	5	30	90	190	263	320	370	394
Angina	DK	14	230.0	210.9	56.4	10	810	10	120	210	255	480	810	810	810
Bronchitis/Emphysema	No	1791	113.9	111.0	2.6	1	790	10	30	80	150	255	340	450	540
Bronchitis/Emphysema	Yes	100	118.1	104.4	10.4	5	480	8	33	90	180	263	298	468	475
Bronchitis/Emphysema	DK	19	182.6	179.3	41.1	5	810	5	50	150	240	340	810	810	810

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Clothes Care

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		893	79.5	73.4	2.5	2	535	10	30	60	118	175	210	300	375
Gender	Male	117	72.2	67.0	6.2	5	360	7	20	60	90	150	210	300	335
Gender	Female	776	80.6	74.2	2.7	2	535	10	30	60	120	180	225	300	375
Age (years)	-	10	59.5	34.8	11.0	15	120	15	25	60	90	105	120	120	120
Age (years)	1 to 4	4	70.0	94.3	47.1	5	210	5	18	33	123	210	210	210	210
Age (years)	5 to 11	11	39.0	33.9	10.2	2	92	2	5	30	60	90	92	92	92
Age (years)	12 to 17	21	37.5	39.4	8.6	3	150	5	10	20	60	80	120	150	150
Age (years)	18 to 64	702	80.5	74.4	2.8	2	535	10	28	60	120	180	210	300	360
Age (years)	> 64	145	85.5	73.5	6.1	2	375	10	30	60	120	180	245	300	375
Race	White	737	80.1	73.4	2.7	2	535	10	30	60	118	175	223	300	375
Race	Black	99	68.6	65.3	6.6	5	300	5	15	45	110	165	210	240	300
Race	Asian	7	107.9	48.8	18.4	60	210	60	80	90	120	210	210	210	210
Race	Some Others	10	62.4	39.1	12.4	18	120	18	21	65	90	120	120	120	120
Race	Hispanic	33	92.9	78.0	13.6	5	265	5	20	90	150	210	225	265	265
Race	Refused	7	100.7	166.0	62.7	15	475	15	20	45	60	475	475	475	475
Hispanic	No	836	78.2	72.3	2.5	2	535	10	30	60	115	165	210	300	360
Hispanic	Yes	51	91.2	71.2	10.0	5	265	5	20	90	150	190	225	225	265
Hispanic	DK	3	118.3	62.5	36.1	55	180	55	55	120	180	180	180	180	180
Hispanic	Refused	3	185.0	251.9	145.5	20	475	20	20	60	475	475	475	475	475
Employment	-	34	43.4	46.3	7.9	2	210	3	10	30	60	92	150	210	210
Employment	Full Time	402	73.4	73.7	3.7	2	535	5	20	60	100	155	223	300	360
Employment	Part Time	116	80.7	68.5	6.4	2	335	10	30	68	118	180	225	240	330
Employment	Not Employed	336	89.8	75.2	4.1	2	475	10	35	60	120	185	235	300	375
Employment	Refused	5	87.4	74.7	33.4	2	180	2	45	60	150	180	180	180	180
Education	-	43	47.5	48.2	7.4	2	210	5	10	30	60	92	150	210	210
Education	< High School	102	86.5	60.0	5.9	10	265	15	38	65	120	175	210	240	245
Education	High School Graduate	337	85.2	82.3	4.5	2	535	10	30	60	120	180	240	375	445
Education	< College	193	85.9	78.5	5.6	2	475	5	21	60	120	190	240	300	375
Education	College Graduate	127	67.8	57.0	5.1	5	260	10	20	60	90	150	190	225	225
Education	Post Graduate	91	68.4	64.7	6.8	5	360	5	20	60	90	145	210	245	360
Census Region	Northeast	222	76.9	67.9	4.6	2	535	10	30	60	120	150	200	245	300
Census Region	Midwest	201	78.4	76.0	5.4	2	475	5	20	60	115	170	210	265	420
Census Region	South	304	81.8	75.7	4.3	5	450	10	30	60	115	170	235	330	375
Census Region	West	166	79.8	73.4	5.7	2	405	5	20	60	120	180	223	300	360
Day Of Week	Weekday	607	75.9	72.9	3.0	2	475	5	25	60	105	160	210	300	375
Day Of Week	Weekend	286	87.2	73.8	4.4	5	535	10	30	65	120	180	223	300	335
Season	Winter	254	82.3	80.2	5.0	2	475	7	23	60	120	190	225	330	445
Season	Spring	213	86.1	79.3	5.4	2	450	10	30	60	120	180	240	335	375
Season	Summer	259	76.7	68.3	4.2	2	535	8	30	60	115	154	190	240	360
Season	Fall	167	71.0	60.5	4.7	3	300	5	25	60	105	150	195	240	300
Asthma	No	829	79.5	74.0	2.6	2	535	10	30	60	118	180	225	300	360
Asthma	Yes	62	79.9	65.3	8.3	5	375	10	30	67	120	154	180	200	375
Asthma	DK	2	45.0	21.2	15.0	30	60	30	30	45	60	60	60	60	60
Angina	No	867	79.5	73.5	2.5	2	535	10	30	60	120	178	210	300	375
Angina	Yes	22	81.6	75.8	16.2	5	335	10	30	60	120	155	195	335	335
Angina	DK	4	60.0	24.5	12.2	30	90	30	45	60	75	90	90	90	90
Bronchitis/emphysema	No	834	78.5	73.6	2.5	2	535	8	25	60	115	170	210	300	375
Bronchitis/emphysema	Yes	58	94.6	68.9	9.1	5	335	15	60	78	120	190	240	300	335
Bronchitis/emphysema	DK	1	60.0	0.0	0.0	60	60	60	60	60	60	60	60	60	60

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Doing Dishes/Laundry

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1865	61.8	68.9	1.6	1	825	10	20	30	80	150	190	255	335
Gender	Male	324	46.1	50.2	2.8	1	360	10	15	30	60	120	135	210	260
Gender	Female	1541	65.1	71.8	1.8	1	825	10	20	35	90	150	200	270	340
Age (years)	-	32	43.8	46.5	8.2	10	225	10	15	30	55	90	150	225	225
Age (years)	1 to 4	10	49.3	66.5	21.0	3	210	3	5	23	55	165	210	210	210
Age (years)	5 to 11	20	34.3	28.8	6.4	1	92	2	15	30	58	83	91	92	92
Age (years)	12 to 17	47	32.7	30.6	4.5	2	150	5	10	20	45	65	90	150	150
Age (years)	18 to 64	1371	63.2	67.1	1.8	1	565	10	20	30	90	150	198	245	335
Age (years)	> 64	385	63.4	79.7	4.1	1	825	9	20	35	80	135	195	285	375
Race	White	1560	62.2	69.5	1.8	1	825	10	20	30	85	148	190	270	335
Race	Black	170	57.8	60.0	4.6	5	390	5	17	30	75	150	180	235	240
Race	Asian	19	56.7	51.7	11.9	3	210	3	15	30	90	120	210	210	210
Race	Some Others	25	46.0	41.4	8.3	5	150	10	15	30	80	120	120	150	150
Race	Hispanic	71	69.0	75.6	9.0	3	325	5	20	35	105	200	225	275	325
Race	Refused	20	60.8	104.2	23.3	5	475	8	15	30	60	128	305	475	475
Hispanic	No	1732	61.3	68.2	1.6	1	825	10	20	30	80	140	180	250	335
Hispanic	Yes	112	68.3	71.5	6.8	3	325	5	20	30	103	180	225	270	275
Hispanic	DK	7	75.7	66.5	25.2	10	180	10	15	55	150	180	180	180	180
Hispanic	Refused	14	62.5	122.3	32.7	5	475	5	15	25	35	120	475	475	475
Employment	-	73	35.3	37.4	4.4	1	210	3	15	20	50	80	120	150	210
Employment	Full Time	776	57.0	63.4	2.3	2	565	10	20	30	70	125	180	240	335
Employment	Part Time	214	63.7	64.8	4.4	2	340	10	15	30	90	151	205	240	275
Employment	Not Employed	789	68.5	76.3	2.7	1	825	10	25	40	90	158	210	285	375
Employment	Refused	13	58.2	59.4	16.5	10	180	10	10	30	100	150	180	180	180
Education	-	99	37.5	38.7	3.9	1	210	3	10	30	55	90	120	180	210
Education	< High School	216	69.8	70.0	4.8	2	570	10	27	45	90	151	195	245	315
Education	High School Graduate	683	67.4	76.7	2.9	1	825	10	20	40	90	150	205	285	405
Education	< College	422	64.3	72.3	3.5	2	475	10	20	30	85	155	210	285	360
Education	College Graduate	262	51.4	49.4	3.1	1	260	10	15	30	70	120	158	200	225
Education	Post Graduate	183	53.7	60.2	4.5	3	360	5	15	30	60	120	190	245	330
Census Region	Northeast	471	59.5	60.1	2.8	2	565	10	20	35	75	135	180	210	285
Census Region	Midwest	405	60.3	68.2	3.4	1	480	5	15	30	75	150	198	240	285
Census Region	South	602	65.8	75.1	3.1	1	825	10	20	35	90	150	210	270	360
Census Region	West	387	59.8	69.6	3.5	2	570	10	15	30	70	150	210	270	345
Day Of Week	Weekday	1270	59.5	68.8	1.9	1	825	9	20	30	75	138	190	245	330
Day Of Week	Weekend	595	66.6	68.9	2.8	5	565	10	20	40	90	150	210	275	340
Season	Winter	503	65.4	79.5	3.5	1	825	10	20	30	90	150	210	300	360
Season	Spring	438	62.8	67.8	3.2	2	450	10	20	35	75	150	190	285	335
Season	Summer	510	61.7	62.8	2.8	2	565	10	20	40	90	140	180	240	270
Season	Fall	414	56.5	63.1	3.1	1	570	8	15	30	65	130	195	230	270
Asthma	No	1712	62.0	69.6	1.7	1	825	10	20	30	85	150	195	270	335
Asthma	Yes	147	60.9	60.6	5.0	2	375	10	20	30	76	151	180	250	255
Asthma	DK	6	36.7	41.8	17.1	10	120	10	10	25	30	120	120	120	120
Angina	No	1790	62.1	69.2	1.6	1	825	10	20	30	85	150	190	255	335
Angina	Yes	66	54.8	63.0	7.8	5	335	9	25	30	60	120	200	315	335
Angina	DK	9	55.6	44.2	14.7	10	120	10	30	30	90	120	120	120	120
Bronchitis/Emphysema	No	1746	60.5	65.3	1.6	1	565	10	20	30	80	140	190	250	325
Bronchitis/Emphysema	Yes	112	82.7	109.5	10.3	3	825	5	20	58	103	170	240	360	570
Bronchitis/Emphysema	DK	7	46.7	51.4	19.4	2	120	2	10	30	120	120	120	120	120

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Animal Care

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		764	48.2	65.0	2.4	1	760	5	10	30	60	120	155	230	312
Gender	Male	282	57.3	81.8	4.9	1	760	5	15	30	65	120	180	308	340
Gender	Female	482	42.8	52.2	2.4	1	450	3	10	29	60	105	140	187	273
Age (years)	-	13	37.5	38.6	10.7	2	135	2	5	30	55	80	135	135	135
Age (years)	1 to 4	9	59.2	44.3	14.8	3	140	3	30	60	90	140	140	140	140
Age (years)	5 to 11	27	47.3	43.1	8.3	2	179	8	15	38	65	120	150	179	179
Age (years)	12 to 17	49	55.2	68.3	9.8	3	308	5	10	25	90	175	180	308	308
Age (years)	18 to 64	530	45.9	66.6	2.9	1	760	3	10	30	60	109	150	230	280
Age (years)	> 64	136	54.8	64.5	5.5	1	383	5	15	30	60	135	180	340	340
Race	White	696	47.8	62.0	2.4	1	760	4	10	30	60	120	155	240	312
Race	Black	26	37.6	39.8	7.8	1	145	1	10	25	45	120	120	145	145
Race	Asian	5	30.4	21.9	9.8	10	60	10	15	20	47	60	60	60	60
Race	Some Others	12	100.0	193.6	55.9	5	690	5	18	30	65	205	690	690	690
Race	Hispanic	17	37.8	45.0	10.9	5	180	5	15	30	35	120	180	180	180
Race	Refused	8	73.8	58.5	20.7	5	180	5	33	55	115	180	180	180	180
Hispanic	No	712	47.8	61.5	2.3	1	760	4	10	30	60	120	151	230	308
Hispanic	Yes	39	50.9	112.8	18.1	2	690	3	10	20	35	120	180	690	690
Hispanic	DK	6	50.0	77.1	31.5	10	205	10	10	15	45	205	205	205	205
Hispanic	Refused	7	67.9	62.0	23.4	5	180	5	20	60	120	180	180	180	180
Employment	-	86	51.2	56.8	6.1	2	308	5	15	30	70	120	175	240	308
Employment	Full Time	376	44.9	71.5	3.7	1	760	3	10	25	60	90	145	240	340
Employment	Part Time	60	48.9	56.3	7.3	3	230	5	13	20	60	153	177	205	230
Employment	Not Employed	233	52.5	59.4	3.9	1	383	5	15	30	60	120	180	273	330
Employment	Refused	9	38.9	53.9	18.0	5	180	5	20	30	30	180	180	180	180
Education	-	98	52.3	57.0	5.8	2	308	5	15	30	70	140	180	240	308
Education	< High School	63	51.5	68.1	8.6	1	383	5	15	30	60	120	225	273	383
Education	High School Graduate	231	52.9	75.8	5.0	1	760	5	10	30	70	120	165	245	330
Education	< College	150	40.6	49.2	4.0	1	280	4	10	20	55	98	155	205	230
Education	College Graduate	121	51.3	79.2	7.2	1	690	3	15	30	60	110	135	340	340
Education	Post Graduate	101	38.7	40.1	4.0	1	240	5	12	30	57	80	105	150	185
Census Region	Northeast	171	39.8	44.9	3.4	1	273	3	10	25	60	90	120	205	245
Census Region	Midwest	181	49.7	58.7	4.4	1	330	4	14	30	60	120	180	240	312
Census Region	South	247	51.4	75.0	4.8	1	760	5	15	30	60	120	165	308	383
Census Region	West	165	50.3	72.6	5.6	1	690	3	10	30	60	120	155	210	340
Day Of Week	Weekday	527	46.6	66.5	2.9	1	760	4	10	30	60	115	155	195	280
Day Of Week	Weekend	237	51.7	61.7	4.0	1	383	5	15	30	60	120	180	273	330
Season	Winter	221	44.6	66.4	4.5	1	690	4	10	25	55	95	160	225	245
Season	Spring	201	53.0	60.4	4.3	1	340	5	15	30	60	120	175	240	330
Season	Summer	216	51.4	76.4	5.2	1	760	5	15	30	64	120	165	240	383
Season	Fall	126	41.1	45.4	4.0	1	280	3	10	25	60	110	135	180	180
Asthma	No	705	48.4	65.5	2.5	1	760	4	10	30	60	120	155	225	308
Asthma	Yes	57	45.4	60.5	8.0	1	330	5	10	30	55	105	195	240	330
Asthma	DK	2	45.0	21.2	15.0	30	60	30	30	45	60	60	60	60	60
Angina	No	734	47.8	64.3	2.4	1	760	5	10	30	60	120	155	225	280
Angina	Yes	27	58.7	85.6	16.5	2	340	3	15	30	60	135	330	340	340
Angina	DK	3	35.0	22.9	13.2	15	60	15	15	30	60	60	60	60	60
Bronchitis/emphysema	No	718	48.4	65.6	2.4	1	760	4	10	30	60	120	160	230	308
Bronchitis/emphysema	Yes	43	45.4	58.5	8.9	2	330	5	10	30	55	90	150	330	330
Bronchitis/emphysema	DK	3	42.7	15.5	9.0	30	60	30	30	38	60	60	60	60	60

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Car Repair and Maintenance

								Percentiles								
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		145	123.4	147.2	12.2	5	700	5	30	60	150	300	495	670	690
Gender	Male	110	135.6	152.7	14.6	5	700	5	30	85	170	300	505	600	670
Gender	Female	35	85.1	122.4	20.7	5	690	5	15	45	120	180	270	690	690
Age (years)	-	1	60.0	-	-	60	60	60	60	60	60	60	60	60	60
Age (years)	1 to 4	1	150.0	-	-	150	150	150	150	150	150	150	150	150	150
Age (years)	5 to 11	1	300.0	-	-	300	300	300	300	300	300	300	300	300	300
Age (years)	12 to 17	8	106.9	163.8	57.9	20	505	20	30	45	90	505	505	505	505
Age (years)	18 to 64	114	130.3	156.5	14.7	5	700	5	30	78	165	300	520	670	690
Age (years)	> 64	20	83.5	68.4	15.3	10	300	13	30	70	120	150	240	300	300
Race	White	112	139.6	158.7	15.0	5	700	10	30	90	175	300	520	670	690
Race	Black	19	85.8	93.5	21.5	5	300	5	20	60	95	300	300	300	300
Race	Asian	2	10.0	7.1	5.0	5	15	5	5	10	15	15	15	15	15
Race	Some Others	6	43.3	42.4	17.3	5	120	5	10	33	60	120	120	120	120
Race	Hispanic	6	58.0	51.6	21.1	5	120	5	13	45	120	120	120	120	120
Hispanic	No	133	123.6	145.0	12.6	5	700	5	30	80	150	300	495	670	690
Hispanic	Yes	10	98.8	153.4	48.5	5	520	5	30	45	120	320	520	520	520
Hispanic	DK	2	232.5	321.7	227.5	5	460	5	5	233	460	460	460	460	460
Employment	-	10	130.5	156.9	49.6	20	505	20	30	53	150	403	505	505	505
Employment	Full Time	77	122.1	150.2	17.1	5	700	5	30	60	165	300	520	670	700
Employment	Part Time	12	123.2	138.8	40.1	8	495	8	40	73	150	270	495	495	495
Employment	Not Employed	46	124.1	147.0	21.7	5	690	10	30	90	120	300	480	690	690
Education	-	13	120.0	139.5	38.7	15	505	15	30	60	120	300	505	505	505
Education	< High School	17	185.9	224.4	54.4	5	670	5	30	90	220	555	670	670	670
Education	High School Graduate	50	111.5	128.3	18.1	5	690	5	30	68	120	270	350	585	690
Education	< College	31	138.2	169.2	30.4	5	700	10	30	85	180	280	600	700	700
Education	College Graduate	20	93.3	99.3	22.2	10	300	10	15	45	135	285	300	300	300
Education	Post Graduate	14	103.4	97.6	26.1	5	300	5	30	75	120	300	300	300	300
Census Region	Northeast	28	130.8	163.7	30.9	8	690	10	30	60	200	300	520	690	690
Census Region	Midwest	31	149.8	173.2	31.1	10	670	10	45	90	120	350	600	670	670
Census Region	South	45	106.8	131.4	19.6	5	700	5	30	60	120	240	300	700	700
Census Region	West	41	116.7	132.2	20.6	5	505	5	30	60	120	300	460	505	505
Day Of Week	Weekday	79	108.5	125.9	14.2	5	690	5	15	60	150	280	350	480	690
Day Of Week	Weekend	66	141.2	168.5	20.7	5	700	10	45	83	150	495	555	670	700
Season	Winter	49	130.7	167.7	24.0	5	690	5	30	60	165	350	600	690	690
Season	Spring	39	136.7	156.0	25.0	5	700	5	45	85	150	300	555	700	700
Season	Summer	35	121.5	137.7	23.3	5	505	5	30	60	150	300	480	505	505
Season	Fall	22	86.7	87.5	18.7	5	300	8	10	70	120	240	270	300	300
Asthma	No	137	117.7	139.6	11.9	5	700	5	30	60	120	300	495	600	690
Asthma	Yes	8	221.9	235.6	83.3	15	670	15	30	150	365	670	670	670	670
Angina	No	139	125.7	149.2	12.7	5	700	5	30	75	150	300	505	670	690
Angina	Yes	5	51.0	72.9	32.6	5	180	5	15	20	35	180	180	180	180
Angina	DK	1	165.0	-	-	165	165	165	165	165	165	165	165	165	165
Bronchitis/Emphysema	No	140	122.3	145.7	12.3	5	700	5	30	68	135	300	500	670	690
Bronchitis/Emphysema	Yes	5	155.0	203.3	90.9	5	460	5	10	30	270	460	460	460	460

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Other Repairs

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		288	184.8	184.1	10.8	2	1080	10	37	120	300	425	525	690	840
Gender	Male	200	205.0	187.7	13.3	2	1080	10	60	150	328	460	555	680	810
Gender	Female	88	138.8	167.8	17.9	3	900	5	18	73	193	360	425	750	900
Age (years)	-	1	540.0	-	-	540	540	540	540	540	540	540	540	540	540
Age (years)	5 to 11	3	66.7	55.1	31.8	10	120	10	10	70	120	120	120	120	120
Age (years)	12 to 17	14	119.5	103.4	27.6	15	345	15	30	90	180	285	345	345	345
Age (years)	18 to 64	221	198.5	192.9	13.0	2	1080	10	45	120	325	434	570	750	840
Age (years)	> 64	49	141.9	146.9	21.0	2	526	10	30	75	209	390	480	526	526
Race	White	264	186.4	184.9	11.4	2	1080	10	37	120	300	430	525	670	840
Race	Black	13	150.4	208.0	57.7	10	750	10	30	90	120	390	750	750	750
Race	Asian	3	321.7	89.5	51.7	270	425	270	270	270	425	425	425	425	425
Race	Some Others	3	173.7	165.2	95.4	45	360	45	45	116	360	360	360	360	360
Race	Hispanic	4	127.5	122.8	61.4	10	290	10	35	105	220	290	290	290	290
Race	Refused	1	75.0	-	-	75	75	75	75	75	75	75	75	75	75
Hispanic	No	278	184.9	184.5	11.1	2	1,080	10	35	120	300	425	525	690	840
Hispanic	Yes	9	160.6	180.7	60.2	10	575	10	60	60	210	575	575	575	575
Hispanic	DK	1	375.0	-	-	375	375	375	375	375	375	375	375	375	375
Employment	-	17	110.2	97.4	23.6	10	345	10	30	90	180	285	345	345	345
Employment	Full Time	140	200.0	206.0	17.4	5	1080	9	60	120	298	470	600	840	900
Employment	Part Time	27	168.0	153.7	29.6	5	490	10	25	120	302	390	434	490	490
Employment	Not Employed	102	183.3	169.1	16.7	2	670	10	30	120	315	420	480	526	600
Employment	Refused	2	61.0	83.4	59.0	2	120	2	2	61	120	120	120	120	120
Education	-	18	110.7	94.6	22.3	10	345	10	30	90	180	285	345	345	345
Education	< High School	23	214.3	215.0	44.8	15	900	30	45	120	360	480	490	900	900
Education	High School Graduate	90	194.4	196.5	20.7	3	840	5	30	133	300	447	575	780	840
Education	< College	64	202.2	200.8	25.1	2	1,080	10	33	130	355	420	480	600	1,080
Education	College Graduate	54	169.0	154.5	21.0	5	525	10	60	98	270	425	490	510	525
Education	Post Graduate	39	172.9	174.2	27.9	2	690	7	38	120	270	420	600	690	690
Census Region	Northeast	55	166.2	181.3	24.5	3	840	5	30	75	210	415	525	600	840
Census Region	Midwest	77	188.9	170.2	19.4	10	780	15	60	120	315	420	460	670	780
Census Region	South	89	202.3	212.3	22.5	2	1,080	10	30	120	315	480	570	900	1,080
Census Region	West	67	172.2	161.7	19.8	2	750	7	60	120	243	340	526	690	750
Day Of Week	Weekday	188	178.2	171.9	12.5	2	780	10	43	110	300	430	490	600	750
Day Of Week	Weekend	100	197.2	205.4	20.5	3	1,080	5	33	145	297	420	585	870	990
Season	Winter	62	167.1	172.1	21.9	3	600	5	15	90	300	445	490	540	600
Season	Spring	65	203.1	216.6	26.9	5	900	10	45	120	300	480	670	840	900
Season	Summer	95	180.4	182.0	18.7	2	1,080	10	60	120	290	390	510	750	1,080
Season	Fall	66	189.7	164.6	20.3	2	600	10	55	120	330	420	435	600	600
Asthma	No	264	180.3	183.7	11.3	2	1080	10	37	120	289	420	525	690	840
Asthma	Yes	24	234.2	185.3	37.8	5	670	10	45	210	353	480	510	670	670
Angina	No	281	179.7	175.3	10.5	2	900	10	30	120	295	420	490	670	780
Angina	Yes	6	448.3	370.0	151.1	90	1,080	90	100	410	600	1,080	1,080	1,080	1,080
Angina	DK	1	45.0	-	-	45	45	45	45	45	45	45	45	45	45
Bronchitis/emphysema	No	276	184.7	185.6	11.2	2	1,080	10	37	120	299	430	526	690	840
Bronchitis/emphysema	Yes	12	187.9	152.6	44.0	5	405	5	45	165	350	360	405	405	405

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

Yardwork/Maintenance[b]

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		1,414	147.7	148.2	3.9	1	1,080	5	45	100	205	360	470	570	655
Sex	Male	804	174.8	160.2	5.6	2	1,080	10	60	120	250	415	510	600	670
Sex	Female	610	111.9	122.0	4.9	1	900	5	30	75	145	278	360	465	510
Age (years)	-	20	181.9	170.3	38.1	5	600	10	60	116	240	468	570	600	600
Age (years)	1 to 4	12	93.2	80.8	23.3	5	285	5	30	83	133	178	285	285	285
Age (years)	5 to 11	26	96.2	85.5	16.8	5	330	5	39	60	120	210	300	330	330
Age (years)	12 to 17	54	116.0	116.8	15.9	3	505	5	30	90	150	285	385	450	505
Age (years)	18 to 64	1,015	150.2	154.5	4.8	1	1,080	5	35	100	210	360	480	585	670
Age (years)	>64	287	149.3	133.8	7.9	2	810	10	60	120	205	330	420	525	630
Race	White	1,249	151.5	150.2	4.3	1	1,080	5	45	105	210	360	480	575	660
Race	Black	77	114.5	127.1	14.5	2	750	5	20	65	165	285	355	405	750
Race	Asian	13	140.0	150.1	41.6	5	425	5	15	85	210	360	425	425	425
Race	Some Others	26	117.2	110.6	21.7	5	380	5	30	88	178	290	360	380	380
Race	Hispanic	37	102.1	113.5	18.7	5	565	5	20	60	120	255	300	565	565
Race	Refused	12	177.1	190.8	55.1	30	600	30	60	98	215	510	600	600	600
Hispanic	No	1,331	148.7	148.0	4.1	1	1,080	5	45	105	209	360	465	570	660
Hispanic	Yes	65	106.2	127.4	15.8	5	575	5	20	60	120	255	300	565	575
Hispanic	DK	8	248.8	206.5	73.0	5	585	5	90	190	420	585	585	585	585
Hispanic	Refused	10	203.5	200.1	63.3	60	600	60	60	120	300	555	600	600	600
Employment	-	92	106.8	101.8	10.6	3	505	5	32	77	148	240	330	450	505
Employment	Full Time	664	146.7	155.5	6.0	1	1,080	5	35	90	203	360	490	575	690
Employment	Part Time	121	134.5	130.8	11.9	2	554	5	30	90	200	317	390	490	495
Employment	Not Employed	526	157.8	147.0	6.4	2	810	10	60	120	220	370	480	595	655
Employment	Refused	11	211.6	198.7	59.9	2	600	2	60	120	375	465	600	600	600
Education	-	105	113.5	113.9	11.1	2	600	5	33	79	150	285	360	450	505
Education	< High School	160	158.5	164.8	13.0	2	900	8	45	111	210	413	493	595	810
Education	High School Graduate	465	151.4	147.0	6.8	3	840	5	50	110	210	345	460	575	690
Education	< College	305	152.8	157.0	9.0	2	1,080	5	45	95	210	360	473	600	630
Education	College Graduate	211	145.4	138.8	9.6	1	625	5	40	105	225	330	465	525	533
Education	Post Graduate	168	142.2	147.8	11.4	2	690	5	30	90	180	340	470	570	630
Census Region	Northeast	291	140.5	139.6	8.2	3	840	5	40	90	200	330	450	525	600
Census Region	Midwest	314	145.1	143.2	8.1	2	780	10	55	95	195	360	445	560	655
Census Region	South	438	152.7	156.4	7.5	2	1,080	5	45	111	205	375	480	585	635
Census Region	West	371	149.6	149.3	7.8	1	750	5	40	104	210	350	480	575	690
Day Of Week	Weekday	878	140.9	140.8	4.8	1	810	5	40	93	190	345	460	560	625
Day Of Week	Weekend	536	158.9	159.2	6.9	2	1,080	5	50	117	225	380	510	600	690
Season	Winter	289	139.4	151.7	8.9	1	690	5	30	75	195	360	480	565	600
Season	Spring	438	162.2	150.5	7.2	3	900	10	60	120	220	360	480	570	700
Season	Summer	458	137.9	140.3	6.6	2	1,080	5	40	90	180	310	440	555	630
Season	Fall	229	150.0	153.4	10.1	2	720	5	40	97	210	390	480	600	655
Asthma	No	1,311	147.0	147.1	4.1	1	1,080	5	45	100	200	355	465	570	635
Asthma	Yes	98	149.3	155.8	15.7	5	670	5	30	90	210	445	480	670	670
Asthma	DK	5	312.0	230.0	102.9	60	600	60	120	300	480	600	600	600	600
Angina	No	1,360	145.3	145.1	3.9	1	900	5	45	100	200	355	465	570	655
Angina	Yes	42	192.6	203.4	31.4	5	1,080	15	60	143	255	465	485	1,080	1,080
Angina	DK	12	257.1	216.7	62.6	5	600	5	53	233	473	510	600	600	600
Bronchitis/Emphysema	No	1,352	148.5	148.5	4.0	1	1,080	5	45	105	205	360	470	570	660
Bronchitis/Emphysema	Yes	57	114.7	121.4	16.1	5	460	5	30	60	135	340	375	405	460
Bronchitis/Emphysema	DK	5	312.0	230.0	102.9	60	600	60	120	300	480	600	600	600	600

Table 16-26. Time Spent (minutes/day) in Selected Activities, Doers Only (continued)

-	= Indicates missing data.
DK	= The respondent replied "don't know".
Refused	= Refused data.
N	= Doer sample size.
SD	= Standard deviation.
SE	= Standard error.
Min	= Minimum number of minutes.
Max	= Maximum number of minutes.
[a]	Includes cleaning house, other repairs, and household work.
[b]	Includes car repair services, other repairs services, outdoor cleaning, car repair maintenance, other repairs, plant care, other household work, domestic crafts, domestic arts.
Source:	U.S. EPA (1996).

Table 16-27. Number of Hours Spent Working (hours/week)

Working for Pay														
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		4,896	0	0	0	12	33	40	50	60	61	61	61	61
Gender	Male	2,466	0	0	0	18	40	40	53	61	61	61	61	61
Gender	Female	2,430	0	0	0	6	28	40	43	55	60	61	61	61
Age (years)	1 to 4	0	-	-	-	-	-	-	-	-	-	-	-	-
Age (years)	5 to 11	0	-	-	-	-	-	-	-	-	-	-	-	-
Age (years)	12 to 17	14	0	0	0	1	9	19	24	26	31	31	31	31
Age (years)	18 to 64	4,625	0	0	0	15	35	40	50	60	61	61	61	61
Age (years)	> 64	181	0	0	0	0	5	21	40	50	61	61	61	61
Race	White	3,990	0	0	0	10	32	40	50	60	61	61	61	61
Race	Black	499	0	0	0	18	35	40	46	60	61	61	61	61
Race	Asian	76	0	0	0	7	37	40	50	61	61	61	61	61
Race	Some Others	87	0	0	0	0	30	40	50	60	61	61	61	61
Race	Hispanic	194	0	0	0	15	32	40	48	60	60	61	61	61
Hispanic	No	4,494	0	0	0	12	33	40	50	60	61	61	61	61
Hispanic	Yes	341	0	0	0	8	32	40	50	60	61	61	61	61
Employment	Full Time	4,094	0	0	0	30	40	40	50	60	61	61	61	61
Employment	Part Time	802	0	0	0	0	10	20	30	38	40	61	61	61
Employment	Not Employed	0	-	-	-	-	-	-	-	-	-	-	-	-
Education	< High School	308	0	0	0	1	21	40	48	61	61	61	61	61
Education	High School Graduate	1,598	0	0	0	12	32	40	48	60	61	61	61	61
Education	< College	1,251	0	0	0	15	30	40	50	60	61	61	61	61
Education	College Graduate	954	0	0	0	16	40	40	50	60	61	61	61	61
Education	Post Graduate	716	0	0	0	10	35	40	50	60	61	61	61	61
Census Region	Northeast	1,096	0	0	0	14	32	40	50	60	61	61	61	61
Census Region	Midwest	1,118	0	0	0	12	32	40	50	60	61	61	61	61
Census Region	South	1,675	0	0	0	12	35	40	50	60	61	61	61	61
Census Region	West	1,007	0	0	0	9	30	40	50	60	61	61	61	61
Day of Week	Weekday	3,306	0	0	0	10	33	40	50	60	61	61	61	61
Day of Week	Weekend	1,590	0	0	0	12	33	40	48	60	61	61	61	61
Season	Winter	1,306	0	0	0	10	32	40	50	60	61	61	61	61
Season	Spring	1,197	0	0	0	15	35	40	50	60	61	61	61	61
Season	Summer	1,343	0	0	0	3	33	40	48	60	61	61	61	61
Season	Fall	1,050	0	0	0	15	32	40	50	60	61	61	61	61
Asthma	No	4,,579	0	0	0	12	34	40	50	60	61	61	61	61
Asthma	Yes	302	0	0	0	9	30	40	48	60	61	61	61	61
Angina	No	4,811	0	0	0	12	34	40	50	60	61	61	61	61
Angina	Yes	66	0	0	0	0	20	40	44	60	61	61	61	61
Bronchitis/Emphysema	No	4,699	0	0	0	12	33	40	50	6	61	61	61	61
Bronchitis/Emphysema	Yes	182	0	0	0	6	30	40	48	60	61	61	61	61

Table 16-27. Number of Hours Spent Working (hours/week) (continued)

Number of Hours Spent Working for Pay Between 6PM and 6AM

			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		4,894	0	0	0	0	0	0	8	30	45	61	61	61
Gender	Male	2,465	0	0	0	0	0	0	10	35	50	61	61	61
Gender	Female	2,429	0	0	0	0	0	0	5	20	39	61	61	61
Age (years)	1 to 4	0	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)	5 to 11	0	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)	12 to 17	14	0	0	0	0	0	5	20	24	25	25	25	25
Age (years)	18 to 64	4,623	0	0	0	0	0	0	8	30	42	61	61	61
Age (years)	> 64	181	0	0	0	0	0	0	0	20	61	61	61	61
Race	White	3,989	0	0	0	0	0	0	8	25	40	61	61	61
Race	Black	499	0	0	0	0	0	0	10	40	61	61	61	61
Race	Asian	75	0	0	0	0	0	0	12	30	61	61	61	61
Race	Some Others	87	0	0	0	0	0	0	7	25	45	61	61	61
Race	Hispanic	194	0	0	0	0	0	0	15	35	48	61	61	61
Hispanic	No	4,492	0	0	0	0	0	0	8	27	40	61	61	61
Hispanic	Yes	341	0	0	0	0	0	0	13	35	50	61	61	61
Employment	Full Time	4,092	0	0	0	0	0	0	8	30	45	61	61	61
Employment	Part Time	802	0	0	0	0	0	0	6	20	35	61	61	61
Employment	Not Employed	0	0	0	0	0	0	0	0	0	0	0	0	0
Education	< High School	308	0	0	0	0	0	0	11	50	61	61	61	61
Education	High School Graduate	1,597	0	0	0	0	0	0	8	35	50	61	61	61
Education	< College	1,251	0	0	0	0	0	0	9	26	40	60	61	61
Education	College Graduate	953	0	0	0	0	0	0	8	20	40	61	61	61
Education	Post Graduate	716	0	0	0	0	0	0	7	20	30	61	61	61
Census Region	Northeast	1,096	0	0	0	0	0	0	7	24	40	61	61	61
Census Region	Midwest	1,118	0	0	0	0	0	0	10	30	42	61	61	61
Census Region	South	1,674	0	0	0	0	0	0	7	30	48	61	61	61
Census Region	West	1,006	0	0	0	0	0	0	10	30	47	61	61	61
Day of Week	Weekday	3,306	0	0	0	0	0	0	8	30	48	61	61	61
Day of Week	Weekend	1,588	0	0	0	0	0	0	7	28	40	61	61	61
Season	Winter	1,305	0	0	0	0	0	0	8	28	40	61	61	61
Season	Spring	1,197	0	0	0	0	0	0	8	30	48	61	61	61
Season	Summer	1,342	0	0	0	0	0	0	9	30	48	61	61	61
Season	Fall	1,050	0	0	0	0	0	0	7	25	40	61	61	61
Asthma	No	4,578	0	0	0	0	0	0	8	30	45	61	61	61
Asthma	Yes	301	0	0	0	0	0	0	8	28	36	61	61	61
Angina	No	4,809	0	0	0	0	0	0	8	30	44	61	61	61
Angina	Yes	66	0	0	0	0	0	0	7	36	40	61	61	61
Bronchitis/Emphysema	No	45,697	0	0	0	0	0	0	8	30	43	61	61	61
Bronchitis/Emphysema	Yes	182	0	0	0	0	0	0	10	40	50	61	61	61

Table 16-27. Number of Hours Spent Working (hours/week) (continued)

Number of Hours Worked in a Week That Was Outdoors (hours/week)

			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		4,891	0	0	0	0	0	0	1	30	50	61	61	61
Gender	Male	2,463	0	0	0	0	0	0	16	42	60	61	61	61
Gender	Female	2,428	0	0	0	0	0	0	0	2	12	55	61	61
Age (years)	1 to 4	0	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)	5 to 11	0	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)	12 to 17	14	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)	18 to 64	4,621	0	0	0	0	0	0	1	30	50	61	61	61
Age (years)	> 64	181	0	0	0	0	0	0	2	29	60	61	61	61
Race	White	3,986	0	0	0	0	0	0	2	30	50	61	61	61
Race	Black	499	0	0	0	0	0	0	0	25	48	61	61	61
Race	Asian	75	0	0	0	0	0	0	0	3	30	40	61	61
Race	Some Others	87	0	0	0	0	0	0	1	17	40	48	61	61
Race	Hispanic	194	0	0	0	0	0	0	2	30	50	61	61	61
Hispanic	No	4,489	0	0	0	0	0	0	1	30	48	61	61	61
Hispanic	Yes	341	0	0	0	0	0	0	2	35	60	61	61	61
Employment	Full Time	4,090	0	0	0	0	0	0	2	35	50	61	61	61
Employment	Part Time	801	0	0	0	0	0	0	0	15	30	61	61	61
Employment	Not Employed	0	0	0	0	0	0	0	0	0	0	0	0	0
Education	< High School	308	0	0	0	0	0	0	17	55	61	61	61	61
Education	High School Graduate	1,594	0	0	0	0	0	0	6	40	60	61	61	61
Education	< College	1,251	0	0	0	0	0	0	1	30	46	61	61	61
Education	College Graduate	953	0	0	0	0	0	0	0	20	35	50	61	61
Education	Post Graduate	716	0	0	0	0	0	0	0	4	15	60	61	61
Census Region	Northeast	1,094	0	0	0	0	0	0	0	25	40	61	61	61
Census Region	Midwest	1,117	0	0	0	0	0	0	0	30	50	61	61	61
Census Region	South	1,674	0	0	0	0	0	0	2	32	55	61	61	61
Census Region	West	1,006	0	0	0	0	0	0	2	33	50	61	61	61
Day of Week	Weekday	3,305	0	0	0	0	0	0	1	32	50	61	61	61
Day of Week	Weekend	1,586	0	0	0	0	0	0	1	30	48	61	61	61
Season	Winter	1,305	0	0	0	0	0	0	0	25	50	61	61	61
Season	Spring	1,195	0	0	0	0	0	0	2	30	50	61	61	61
Season	Summer	1,341	0	0	0	0	0	0	2	36	50	61	61	61
Season	Fall	1,050	0	0	0	0	0	0	0	30	45	61	61	61
Asthma	No	4,576	0	0	0	0	0	0	1	30	50	61	61	61
Asthma	Yes	300	0	0	0	0	0	0	0	31	50	61	61	61
Angina	No	4,806	0	0	0	0	0	0	1	30	50	61	61	61
Angina	Yes	66	0	0	0	0	0	0	4	35	50	61	61	61
Bronchitis/Emphysema	No	4,694	0	0	0	0	0	0	1	30	50	61	61	61
Bronchitis/Emphysema	Yes	182	0	0	0	0	0	0	2	30	60	61	61	61

\- Signifies missing data.
N = Doer sample size.
Note: A value of "61" for number of hours signifies that more than 60 hours were spent. Percentiles are the percentage of doers below or equal to a given number of hours.

Source: U.S. EPA (1996).

Table 16-28. Number of Showers Taken per Day, by Children <21 Years

Age (years)	*N*	Showers per Day				
		0	1	2	3	Don't Know
Birth to <1	37	36	1	0	0	0
1 to <2	53	48	5	0	0	0
2 to <3	67	54	10	2	0	1
3 to <6	187	153	25	7	1	1
6 to <11	245	122	95	25	1	2
11 to <16	258	51	150	53	3	1
16 to <21	232	23	147	57	5	0

N = Number of respondents.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-29. Time Spent (minutes) Bathing, Showering, and in Bathroom Immediately After Bathing and Showering, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Duration of Bath (minutes)															
Birth to <1	26	19	5	5	5	6	8	10	18	28	30	30	45	53	60
1 to <2	37	23	10	10	10	10	10	15	20	30	30	32	41	43	45
2 to <3	48	23	1	2.9	5	7	10	15	20	30	30	45	60	60	60
3 to <6	125	24	5	5	5	6	10	15	25	30	35	60	60	61	61
6 to <11	89	24	5	5	5	10	10	15	20	30	31	46	60	60	61
11 to <16	38	25	5	6	6	10	10	16	20	30	40	43	60	61	61
16 to <21	17	33	10	11	12	14	18	20	30	45	60	60	61	61	61
Duration in Bathroom Immediately Following a Bath (minutes)															
Birth to <1	26	2	0	0	0	0	0	0	1	3	9	10	10	10	10
1 to <2	37	3	0	0	0	0	0	1	2	5	5	6	10	10	10
2 to <3	48	4	0	0	0	0	0	0	1.5	5	10	15	15	18	20
3 to <6	125	4	0	0	0	0	0	1	2	5	10	15	15	19	30
6 to <11	89	4	0	0	0	0	0	1	3	5	10	10	16	21	30
11 to <16	38	9	0	0	0	1	1	2	5	14	20	26	33	36	40
16 to <21	17	11	0	0	1	2	3	5	10	10	19	29	39	42	45
Sum of Duration in Bath and in Bathroom Immediately Following Bath (minutes)															
Birth to <1	26	22	6	7	8	9	10	12	19	29	32	38	55	63	70
1 to <2	37	26	10	10	11	12	16	17	30	32	35	41	46	48	50
2 to <3	48	26	6	7	8	10	14	16	23	34	45	50	60	61	61
3 to <6	125	28	5	6	7	10	12	18	30	32	48	60	66	69	76
6 to <11	89	28	6	6	9	10	13	20	25	33	41	60	63	71	80
11 to <16	38	33	7	8	10	12	16	23	31	41	52	64	70	70	70
16 to <21	17	45	15	15	16	17	21	30	40	60	73	77	82	83	85
Duration of Shower (minutes)															
Birth to <1	1	15	15	-	-	-	-	-	-	-	-	-	-	-	15
1 to <2	5	20	5	-	-	-	-	-	-	-	-	-	-	-	30
2 to <3	12	22	5	5	5	5	6	14	20	30	30	44	53	57	60
3 to <6	33	17	3	4	4	5	5	10	15	20	30	34	47	54	60
6 to <11	119	18	4	5	5	5	7	10	15	20	30	41	57	60	60
11 to <16	204	18	3	4	5	5	6	10	15	20	30	40	50	60	60
16 to <21	207	20	3	5	5	5	8	10	15	30	40	45	60	60	61
Duration in Shower Room Immediately Following a Shower (minutes)															
Birth to <1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1
1 to <2	5	10	0	-	-	-	-	-	-	-	-	-	-	-	45
2 to <3	12	5	0	0	0	1	1	1	4	6	10	12	14	14	15
3 to <6	33	7	0	0	1	2	2	3	5	10	15	20	22	23	25
6 to <11	119	6	0	0	0	0	1	2	5	10	13	16	26	30	30
11 to <16	204	8	0	0	0	0	1	3	5	10	19	30	40	45	60
16 to <21	207	8	0	0	0	0	1	3	5	10	15	20	30	39	61
Sum of Shower Duration and Time Spent in Shower Room Immediately Following Shower (minutes)															
Birth to <1	1	16	16	-	-	-	-	-	-	-	-	-	-	-	16
1 to <2	5	30	6	-	-	-	-	-	-	-	-	-	-	-	60
2 to <3	12	27	6	6	7	8	11	19	21	33	44	56	65	67	70
3 to <6	33	24	8	8	8	8	8	13	25	30	40	45	57	64	70
6 to <11	119	24	5	6	6	8	10	15	20	30	43	50	61	68	90
11 to <16	204	26	4	5	7	10	11	15	22	35	50	60	65	70	70
16 to <21	207	28	4	5	7	10	10	15	25	35	50	60	74	89	121

N = Doer sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.
Note: A value of "61" was used for any shower, bath, or bathroom stay longer than 60 minutes. A value of "121" for the sum of shower duration and time spent in bathroom following shower (or the sum of bath duration and time spent in bathroom following bath) signifies that more than 120 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-30. Mean Time Spent (minutes/day) and Bathing/Showering, Adults 18 Years and Older, Doers Only

Age (years)	Mean No. Baths/Showers per Day[a]	Median Time Spent in Shower/Bath[b] (minutes/bath)	Time Spent in Shower/Bath[c] (minutes/day)
18 to 64	1.27	13.5	17.1
>64	1.14	15.0	17.1

[a] For additional statistics see Table 16-30. Calculated by averaging the reported number of baths/showers taken per day (truncated at 11), by the number of respondents. Respondents responding Missing and Don't Know were excluded (N = 5).

[b] For additional statistics see Table 16-31.

[c] Calculated by multiplying the mean number of showers/baths per day by the median time spent in shower/bath.

Source: U.S. EPA (1996).

Table 16-31. Number of Times Respondent Took Shower, Doers Only

Category	*N*	-	1	2	3	4	5	8	10	11+	DK
All	3,594	2	2,747	802	30	1	1	1	1	4	5
Sex											
Male	1,720	-	1,259	436	21	1	-	-	-	1	2
Female	1,872	2	1,486	366	9	-	1	1	1	3	3
Refused	2	-	2	-	-	-	-	-	-	-	-
Age (years)											
-	64	-	46	17	-	-	-	-	-	-	1
1 to 4	41	-	30	9	1	-	-	-	-	-	1
5 to 11	140	-	112	26	1	-	-	-	-	-	1
12 to 17	270	-	199	65	6	-	-	-	-	-	-
18 to 64	2,650	1	1,983	636	21	-	-	-	-	3	2
>64	429	1	377	49	1	-	-	-	-	1	-
Race											
White	2,911	2	2,323	562	17	-	1	-	-	4	2
Black	349	-	199	140	7	1	-	1	-	-	1
Asian	64	-	49	14	1	-	-	-	-	-	-
Some Others	65	-	40	23	2	-	-	-	-	-	-
Hispanic	162	-	103	56	2	-	-	-	1	-	-
Refused	43	-	33	7	1	-	-	-	-	-	2
Hispanic											
No	3,269	2	2,521	711	24	1	1	1	-	4	4
Yes	277	-	190	81	5	-	-	-	1	-	-
DK	17	-	13	4	-	-	-	-	-	-	-
Refused	31	-	23	6	1	-	-	-	-	-	1
Employment											
-	439	-	330	99	8	-	-	-	-	-	2
Full Time	1,838	1	1,361	454	17	-	-	-	1	2	2
Part Time	328	1	261	65	-	-	1	-	-	-	-
Not Employed	967	-	780	177	5	1	-	1	-	2	1
Refused	22	-	15	7	-	-	-	-	-	-	-
Education											
-	515	-	382	121	9	-	-	-	-	-	3
< High School	297	-	240	54	2	-	-	-	-	1	-
High School Graduate	1,042	1	789	243	5	-	1	1	-	1	1
< College	772	1	589	176	4	-	-	-	1	-	1
College Graduate	576	-	434	133	7	1	-	-	-	1	-
Post Graduate	392	-	313	75	3	-	-	-	-	1	-
Census Region											
Northeast	828	-	622	196	7	-	-	-	-	-	3
Midwest	756	-	621	131	3	-	-	-	-	-	1
South	1,246	1	893	334	14	1	-	-	-	3	-
West	764	1	611	141	6	-	1	1	1	1	1
Day Of Week											
Weekday	2,481	-	1,889	563	17	1	1	1	1	4	4
Weekend	1,113	2	858	239	13	-	-	-	-	-	1
Season											
Winter	941	-	732	198	9	-	-	-	-	1	1
Spring	889	-	674	205	7	-	-	-	1	-	2
Summer	1,003	-	735	254	10	1	-	-	-	2	1
Fall	761	2	606	145	4	-	1	1	-	1	1
Asthma											
No	3,312	2	2,543	730	25	1	1	1	1	4	4
Yes	261	-	189	67	5	-	-	-	-	-	-
DK	21	-	15	5	-	-	-	-	-	-	1
Angina											
No	3,481	1	2,653	730	25	1	1	1	1	4	4
Yes	261	-	189	67	5	-	-	-	-	-	-
DK	22	-	17	4	-	-	-	-	-	-	1

Table 16-31. Number of Times Respondent Took Shower, Doers Only (continued)

Category	*N*	-	1	2	3	4	5	8	10	11+	DK
Bronchitis/Emphysema											
No	3,419	2	2,620	758	27	1	1	1	1	4	4
Yes	154	-	112	39	3	-	-	-	-	-	-
DK	21	-	15	5	-	-	-	-	-	-	1

- = Indicates missing data.
DK = The respondent replied “don’t know”.
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-32. Time Spent (minutes) Showering and in Shower Room Immediately After Showering (minutes/shower)

			Duration of Shower											
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		3,547	3	4	5	5	10	15	20	30	35	50	60	61
Gender	Male	1,707	3	4	5	5	10	15	20	30	30	45	60	61
Gender	Female	1,838	3	4	5	5	10	15	20	30	40	60	60	61
Age (years)	1 to 4	40	5	5	5	5	5	10	18	30	50	60	60	60
Age (years)	5 to 11	139	3	4	5	5	10	15	20	30	40	60	60	60
Age (years)	12 to 17	268	5	5	5	7	10	15	25	35	45	60	60	61
Age (years)	18 to 64	2,634	3	3	5	5	10	15	20	30	30	45	60	61
Age (years)	> 64	408	3	3	5	5	10	10	20	30	30	45	60	61
Race	White	2,873	3	4	5	5	10	13	20	30	30	45	60	61
Race	Black	344	4	4	5	6	10	20	20	40	60	60	61	61
Race	Asian	64	1	3	4	5	10	15	20	30	40	48	61	61
Race	Some Others	65	3	3	5	10	10	15	20	45	60	60	61	61
Race	Hispanic	161	3	4	5	6	10	15	20	40	45	60	61	61
Hispanic	No	3,226	3	4	5	5	10	15	20	30	30	45	60	61
Hispanic	Yes	276	3	4	5	6	10	15	23	39	45	60	61	61
Employment	Full Time	1,828	3	4	5	5	10	15	20	30	30	45	60	61
Employment	Part Time	324	2	3	5	5	10	12	20	30	30	45	60	60
Employment	Not Employed	940	3	3	5	5	10	15	20	30	40	60	60	61
Education	< High School	289	4	5	5	8	10	15	20	30	40	60	60	61
Education	High School Graduate	1,030	2	3	5	5	10	15	20	30	40	60	60	61
Education	< College	760	3	5	5	5	10	12	20	30	30	45	60	61
Education	College Graduate	574	3	3	5	5	10	10	20	25	30	40	60	61
Education	Post Graduate	389	2	3	4	5	7	10	15	25	30	45	60	61
Census Region	Northeast	821	4	5	5	5	10	15	20	30	32	50	60	61
Census Region	Midwest	745	3	4	5	5	10	10	20	30	30	45	60	61
Census Region	South	1,220	3	3	5	5	10	15	20	30	40	60	60	61
Census Region	West	761	2	3	5	5	10	10	15	30	30	45	60	61
Day of Week	Weekday	2,447	3	4	5	5	10	15	20	30	35	48	60	61
Day of Week	Weekend	1,100	3	4	5	5	10	15	20	30	40	60	60	61
Season	Winter	929	3	4	5	5	10	15	20	30	40	60	60	61
Season	Spring	875	3	4	5	5	10	15	20	30	40	60	60	61
Season	Summer	992	2	3	5	5	10	15	20	30	40	45	60	61
Season	Fall	751	3	4	5	5	10	12	20	30	30	40	48	61
Asthma	No	3,274	3	4	5	5	10	15	20	30	32	45	60	61
Asthma	Yes	257	3	4	5	5	10	15	20	40	50	60	60	61
Angina	No	3,445	3	4	5	5	10	15	20	30	35	50	60	61
Angina	Yes	84	3	4	5	5	10	15	15	30	30	40	45	45
Bronchitis/Emphysema	No	3,379	3	4	5	5	10	15	20	30	35	50	60	61
Bronchitis/Emphysema	Yes	151	3	4	5	5	10	15	20	30	40	48	60	61

Table 16-32. Time Spent (minutes) Showering and in Shower Room Immediately After Showering (minutes/shower) (continued)

Duration in Shower Room Immeditately Following a Shower (minutes)														
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		3,533	0	0	0	1	3	5	10	20	30	40	50	61
Gender	Male	1,698	0	0	0	1	3	5	10	15	20	30	30	61
Gender	Female	1,833	0	0	0	1	3	5	12	20	30	45	60	61
Age (years)	1 to 4	41	0	0	0	0	1	5	10	15	20	45	45	45
Age (years)	5 to 11	137	0	0	0	1	2	5	10	15	20	30	30	60
Age (years)	12 to 17	2,619	0	0	0	1	3	5	10	20	30	40	52	61
Age (years)	18 to 64	2,619	0	0	0	1	3	5	10	20	30	40	52	61
Age (years)	> 64	409	0	0	0	1	4	5	10	20	30	35	45	60
Race	White	2,872	0	0	0	1	3	5	10	20	30	40	50	61
Race	Black	341	0	0	0	1	3	5	10	20	25	30	45	60
Race	Asian	64	0	0	0	0	2	5	10	15	20	30	60	60
Race	Some Others	62	0	0	0	0	3	5	10	30	35	45	52	52
Race	Hispanic	156	0	0	0	1	3	5	10	20	25	40	60	60
Hispanic	No	3,221	0	0	0	1	3	5	10	20	30	40	50	61
Hispanic	Yes	269	0	0	0	1	3	5	10	20	25	45	60	60
Employment	Full Time	1,818	0	0	0	1	3	5	10	20	30	35	50	60
Employment	Part Time	323	0	0	0	1	3	5	10	20	30	45	50	60
Employment	Not Employed	938	0	0	0	1	3	5	10	20	30	45	60	61
Education	< High School	283	0	0	0	1	3	5	15	20	30	45	45	61
Education	High School Graduate	1,025	0	0	0	1	3	5	10	20	30	45	60	61
Education	< College	761	0	0	0	1	3	5	10	20	30	35	50	61
Education	College Graduate	573	0	0	1	1	3	5	10	20	30	35	45	60
Education	Post Graduate	387	0	0	0	1	2	5	10	20	30	30	45	60
Census Region	Northeast	822	0	0	0	1	3	5	10	20	25	40	50	60
Census Region	Midwest	737	0	0	0	1	3	5	10	20	30	35	45	60
Census Region	South	1,220	0	0	0	1	3	5	10	20	30	40	45	61
Census Region	West	754	0	0	0	1	2	5	10	20	30	30	60	61
Day of Week	Weekday	2,438	0	0	0	1	3	5	10	20	30	40	50	61
Day of Week	Weekend	1,095	0	0	0	1	3	5	10	20	30	40	50	61
Season	Winter	930	0	0	0	1	4	5	10	20	30	40	45	61
Season	Spring	876	0	0	0	1	2	5	10	20	30	45	60	61
Season	Summer	978	0	0	0	1	3	5	10	20	30	30	50	61
Season	Fall	749	0	0	0	1	3	5	10	20	25	40	53	61
Asthma	No	3,260	0	0	0	1	3	5	10	20	30	38	50	61
Asthma	Yes	259	0	0	0	1	3	5	13	20	30	40	45	61
Angina	No	3,429	0	0	0	1	3	5	10	20	30	40	50	61
Angina	Yes	88	0	0	0	2	3	8.5	15	20	30	30	45	45
Bronchitis/Emphysema	No	3,366	0	0	0	1	3	5	10	20	30	40	50	61
Bronchitis/Emphysema	Yes	152	0	0	0	1	2.5	5	10	20	30	30	45	60

N = Doer sample size.

Note: Percentiles are the percentage of doers below or equal to a given number of minutes. A value of 61 for number of minutes signifies that more than 60 minutes were spent.

Source: U.S. EPA (1996).

Table 16-33. Number of Baths Given or Taken in One Day by Number of Respondents

		Number of Baths/Day										
Category	*N*	1	2	3	4	5	6	7	10	11	15	DK
All	649	459	144	20	9	4	2	1	1	1	3	5
Gender												
Male	159	117	33	5	1	-	1	1	-	-	1	-
Female	490	342	111	15	8	4	1	-	1	1	2	5
Age (years)												
-	9	8	1	-	-	-	-	-	-	-	-	-
18 to 64	491	322	127	20	9	4	2	1	1	1	2	2
> 64	149	129	16	-	-	-	-	-	-	-	1	3
Race												
White	487	364	92	13	7	2	1	-	-	1	2	5
Black	106	68	29	5	1	-	1	1	1	-	-	-
Asian	12	5	5	-	1	-	-	-	-	-	1	-
Some Others	12	7	4	1	-	-	-	-	-	-	-	-
Hispanic	26	10	13	1	-	2	-	-	-	-	-	-
Refused	6	5	1	-	-	-	-	-	-	-	-	-
Hispanic												
No	600	430	127	19	9	2	2	1	1	1	3	5
Yes	40	21	16	1	-	2	-	-	-	-	-	-
DK	6	5	1	-	-	-	-	-	-	-	-	-
Ref	3	3	-	-	-	-	-	-	-	-	-	-
Employment												
-	1	1	-	-	-	-	-	-	-	-	-	-
Full Time	283	183	76	12	5	-	2	1	1	1	1	1
Part Time	76	56	17	1	1	1	-	-	-	-	-	-
Not Employed	287	217	51	7	3	3	-	-	-	-	2	4
Refused	2	2	-	-	-	-	-	-	-	-	-	-
Education												
-	4	4	-	-	-	-	-	-	-	-	-	-
< High School	96	66	19	3	2	2	-	-	-	-	1	3
High School Graduate	235	167	54	8	2	-	1	1	-	-	-	2
< College	163	112	38	6	2	2	1	-	-	1	1	-
College Graduate	102	68	28	3	2	-	-	-	1	-	-	-
Post Graduate	49	42	5	-	1	-	-	-	-	-	1	-
Census Region												
Northeast	137	100	25	3	4	1	1	-	-	1	-	2
Midwest	151	116	29	4	1	-	-	-	1	-	-	-
South	255	164	70	9	2	3	1	1	-	-	2	3
West	106	79	20	4	2	-	-	-	-	-	1	-
Day of Week												
Weekday	415	299	89	10	4	2	2	1	1	1	2	4
Weekend	234	160	55	10	5	2	-	-	-	-	1	1
Season												
Winter	178	124	37	10	1	3	-	-	-	-	1	2
Spring	160	126	27	4	1	-	-	1	-	-	-	1
Summer	174	112	49	4	3	1	1	-	1	-	2	1
Fall	137	97	31	2	4	-	1	-	-	1	-	1
Asthma												
No	596	424	129	19	7	4	2	1	1	1	3	5
Yes	52	34	15	1	2	-	-	-	-	-	-	-
DK	1	1	-	-	-	-	-	-	-	-	-	-
Angina												
No	620	435	141	19	9	4	2	1	1	1	3	4
Yes	26	22	2	1	-	-	-	-	-	-	-	1
DK	3	2	1	-	-	-	-	-	-	-	-	-
Bronchitis/Emphysema												
No	610	429	137	20	9	4	2	1	1	1	2	4
Yes	36	27	7	-	-	-	-	-	-	-	1	1
DK	3	3	-	-	-	-	-	-	-	-	-	-

- = Indicates missing data.
DK = The respondent replied “don't know”.
N = Doer sample size.
Refused = Refused data.

Source: U.S. EPA (1996).

Table 16-34. Time Spent (minutes) Giving and Taking the Bath(s) and in Bathroom Immediately After Bathing (minutes/bath)

		Duration of Bath (minutes/bath)													
			Percentiles												
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		631	2	5	5	10	15	20	30	45	60	61	61	61
Gender	Male	155	1	4	5	6	10	15	30	45	60	61	61	61
Gender	Female	476	3	5	5	10	15	20	30	45	60	61	61	61
Age (years)	18 to 64	485	2	5	5	10	15	20	30	60	60	61	61	61
Age (years)	> 64	139	3	5	5	5	10	15	20	40	60	61	61	61
Race	White	476	1	4	5	10	10	20	30	45	60	61	61	61
Race	Black	102	5	5	9	10	15	23	40	60	61	61	61	61
Race	Asian	12	10	10	10	10	15	20	28	30	40	40	40	40
Race	Some Others	12	5	5	5	10	15	28	30	40	61	61	61	61
Race	Hispanic	25	2	2	5	5	10	20	45	61	61	61	61	61
Hispanic	No	584	2	5	5	10	15	20	30	45	60	61	61	61
Hispanic	Yes	39	2	2	5	5	10	20	30	60	61	61	61	61
Employment	Full Time	279	1	4	5	10	15	20	30	45	60	61	61	61
Employment	Part Time	75	3	4	5	10	10	20	30	35	40	60	60	60
Employment	Not Employed	275	2	5	5	10	10	20	30	60	60	61	61	61
Education	< High School	89	1	5	10	10	15	20	35	60	61	61	61	61
Education	High School Graduate	229	5	5	5	10	12	20	30	45	60	61	61	61
Education	< College	159	1	2	5	6	10	20	30	45	60	61	61	61
Education	College Graduate	102	5	5	8	10	15	20	30	45	60	60	60	61
Education	Post Graduate	49	1	1	5	5	10	15	25	40	45	60	60	60
Census Region	Northeast	132	1	5	5	6	10	15	30	45	60	61	61	61
Census Region	Midwest	149	2	4	5	7	10	20	30	30	60	61	61	61
Census Region	South	246	3	5	10	10	15	20	35	60	60	61	61	61
Census Region	West	104	5	5	5	10	11	20	30	45	60	61	61	61
Day of Week	Weekday	403	2	5	5	10	15	20	30	45	60	61	61	61
Day of Week	Weekend	228	4	5	5	10	10	20	30	60	60	61	61	61
Season	Winter	173	2	5	5	10	10	20	30	45	60	61	61	61
Season	Spring	154	1	3	5	10	10	20	30	45	60	61	61	61
Season	Summer	171	5	5	5	10	10	20	30	60	60	61	61	61
Season	Fall	133	4	5	8	10	15	20	30	45	60	61	61	61
Asthma	No	580	2	5	5	10	12	20	30	45	60	61	61	61
Asthma	Yes	51	4	5	5	10	15	20	30	60	61	61	61	61
Angina	No	606	2	5	5	10	15	20	30	45	60	61	61	61
Angina	Yes	23	5	5	5	5	10	15	30	40	45	60	60	60
Bronchitis/Emphysema	No	595	2	5	5	10	10	20	30	45	60	61	61	61
Bronchitis/Emphysema	Yes	34	5	5	8	15	15	20	30	45	45	60	60	60

Table 16-34. Time Spent (minutes) Giving and Taking the Bath(s) and in Bathroom Immediately After Bathing (minutes/bath) (continued)

Duration in Bathroom Immediately After the Bath(s) (minutes/bath)														
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		624	0	0	0	0	2	5	10	20	30	45	55	61
Gender	Male	153	0	0	0	0	2	5	10	12	20	30	35	45
Gender	Female	471	0	0	0	0	2	5	10	20	30	45	60	61
Age (years)	18 to 64	484	0	0	0	0	2	5	10	15	25	40	50	61
Age (years)	> 64	133	0	0	0	1	5	10	15	30	35	55	60	60
Race	White	465	0	0	0	0	2	5	10	18	30	45	58	61
Race	Black	104	0	0	0	0	2	5	10	20	30	40	45	45
Race	Asian	12	0	0	0	0	2	5	8	10	20	20	20	20
Race	Some Others	12	0	0	0	0	0	3	8	10	15	15	15	15
Race	Hispanic	26	0	0	0	0	1	5	10	25	25	61	61	61
Hispanic	No	575	0	0	0	0	2	5	10	20	30	40	50	61
Hispanic	Yes	40	0	0	0	0	1	5	10	23	25	61	61	61
Employment	Full Time	277	0	0	0	0	2	5	10	15	20	30	30	45
Employment	Part Time	75	0	0	0	0	3	5	10	15	25	35	40	40
Employment	Not Employed	269	0	0	0	0	2	5	10	25	35	58	60	61
Education	< High School	86	0	0	0	0	5	10	15	30	35	61	61	61
Education	High School Graduate	229	0	0	0	0	2	5	10	15	30	40	45	58
Education	< College	159	0	0	0	0	2	5	10	15	30	45	60	60
Education	College Graduate	100	0	0	0	0	2	5	10	19	25	30	38	45
Education	Post Graduate	47	0	0	0	0	1	5	10	15	20	30	30	30
Census Region	Northeast	129	0	0	0	0	2	5	10	20	30	30	30	60
Census Region	Midwest	146	0	0	0	0	2	5	10	15	25	50	60	60
Census Region	South	246	0	0	0	0	3	5	10	20	30	45	55	61
Census Region	West	103	0	0	0	0	1	5	10	20	20	30	45	58
Day of Week	Weekday	398	0	0	0	0	2	5	10	18	30	40	50	61
Day of Week	Weekend	226	0	0	0	0	3	5	10	20	30	45	60	61
Season	Winter	175	0	0	0	1	3	5	10	20	30	58	61	61
Season	Spring	152	0	0	0	0	2	5	10	20	30	40	45	60
Season	Summer	165	0	0	0	0	2	5	10	15	20	30	45	50
Season	Fall	132	0	0	0	0	2	5	10	15	20	45	55	60
Asthma	No	572	0	0	0	0	2	5	10	20	30	45	58	61
Asthma	Yes	51	0	0	0	0	1	5	10	15	30	30	45	45
Angina	No	597	0	0	0	0	2	5	10	20	30	45	58	61
Angina	Yes	24	0	0	0	1	5	5	10	15	30	55	55	55
Bronchitis/Emphysema	No	588	0	0	0	0	2	5	10	20	30	45	58	61
Bronchitis/Emphysema	Yes	33	0	0	0	0	2	5	10	30	40	45	45	45

N = Doer sample size.

Note: Percentiles are the percentage of doers below or equal to a given number of minutes. A value of 61 for number of minutes signifies that more than 60 minutes were spent.

Source: U.S. EPA (1996).

Table 16-35. Time Spent Altogether in the Shower or Bathtub and in the Bathroom Immediately Following a Shower or Bath (minutes/bath)

Duration in Shower or Bathtub (minutes/bath)														
			Percentiles											
Group Name	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		4,252	3	4	5	5	10	15	20	30	35	60	60	121
Gender	Male	1,926	3	4	5	5	10	15	20	30	30	60	60	121
Gender	Female	2,325	3	4	5	5	10	15	20	30	40	60	75	121
Age (years)	1 to 4	198	1	5	5	10	15	20	30	45	60	120	120	120
Age (years)	5 to 11	263	4	5	5	10	13	20	30	30	60	90	120	121
Age (years)	12 to 17	239	4	4	5	7	10	15	30	30	45	60	60	120
Age (years)	18 to 64	2,904	3	4	5	5	10	14	20	30	30	50	60	121
Age (years)	> 64	567	2	3	5	5	10	15	20	30	30	45	60	120
Race	White	3,425	3	4	5	5	10	15	20	30	30	60	60	121
Race	Black	446	4	4	5	6	10	15	25	30	45	75	120	121
Race	Asian	74	5	5	5	7	10	15	15	30	30	60	90	90
Race	Some Others	78	5	5	5	7	10	15	30	30	45	60	60	60
Race	Hispanic	178	1	3	5	7	10	15	20	30	45	90	100	120
Hispanic	No	3,861	3	4	5	5	10	15	20	30	35	60	60	121
Hispanic	Yes	328	1	3	5	5	10	15	20	30	45	60	90	120
Employment	Full Time	1,974	3	4	5	5	10	10	20	30	30	45	60	121
Employment	Part Time	395	3	3	5	5	10	15	20	30	30	45	60	60
Employment	Not Employed	1,161	2	3	5	5	10	15	20	30	35	60	60	121
Education	< High School	376	1	4	5	5	10	15	25	30	45	60	90	121
Education	High School Graduate	1,242	3	4	5	5	10	15	20	30	30	60	60	121
Education	< College	862	3	4	5	5	10	15	20	30	30	45	60	120
Education	College Graduate	554	3	3	5	5	10	10	15	30	30	45	90	120
Education	Post Graduate	449	3	4	5	5	8	10	15	20	30	45	60	121
Census Region	Northeast	920	4	4	5	5	10	15	20	30	35	60	100	121
Census Region	Midwest	947	3	4	5	5	10	15	20	30	30	45	60	120
Census Region	South	1,497	3	4	5	5	10	15	20	30	45	60	75	121
Census Region	West	888	3	3	5	5	10	15	20	30	30	45	60	121
Day of Week	Weekday	2,858	3	4	5	5	10	15	20	30	30	60	60	121
Day of Week	Weekend	1,394	3	4	5	5	10	15	20	30	40	60	75	121
Season	Winter	1,116	3	4	5	5	10	15	20	30	35	60	60	121
Season	Spring	1,130	3	4	5	5	10	15	20	30	40	60	90	121
Season	Summer	1,154	3	4	5	5	10	15	20	30	40	60	60	121
Season	Fall	852	3	5	5	5	10	15	20	30	30	60	60	121
Asthma	No	3,911	3	4	5	5	10	15	20	30	30	60	60	121
Asthma	Yes	325	3	4	5	5	10	15	20	30	45	60	120	121
Angina	No	4,117	3	4	5	5	10	15	20	30	35	60	60	121
Angina	Yes	111	3	4	5	5	10	15	20	30	30	45	45	60
Bronchitis/Emphysema	No	4,025	3	4	5	5	10	15	20	30	30	60	60	121
Bronchitis/Emphysema	Yes	205	1	3	5	5	10	15	20	30	45	60	120	121

Table 16-35. Time Spent Altogether in the Shower or Bathtub and in the Bathroom Immediately Following a Shower or Bath (minutes/bath) (continued)

Duration in Bathroom Immediately Following a Shower or Bath (minutes/bath)														
			Percentiles											
Group Name	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		4,182	0	0	0	1	4	5	15	20	30	40	60	121
Gender	Male	1,897	0	0	0	1	3	5	10	15	20	30	40	121
Gender	Female	2,284	0	0	0	1	5	10	15	30	30	45	60	121
Age (years)	1 to 4	196	0	0	0	0	0	2	5	10	15	20	35	45
Age (years)	5 to 11	260	0	0	0	0	2	5	10	15	15	30	35	120
Age (years)	12 to 17	238	0	0	0	2	5	5	10	20	30	45	45	60
Age (years)	18 to 64	2,866	0	0	0	1	5	10	15	20	30	45	60	121
Age (years)	> 64	548	0	0	0	1	4	10	15	20	30	40	60	120
Race	White	3,372	0	0	0	1	4	5	15	20	30	40	60	121
Race	Black	438	0	0	0	0	4	6	15	30	30	60	60	60
Race	Asian	74	0	0	0	0	2	5	10	20	30	35	45	45
Race	Some Others	76	0	0	0	1	5	10	15	20	25	30	60	60
Race	Hispanic	176	0	0	1	1	3	5	10	20	30	30	30	60
Hispanic	No	3,797	0	0	0	1	4	5	15	20	30	45	60	121
Hispanic	Yes	325	0	0	0	1	3	5	10	20	30	30	30	60
Employment	Full Time	1,949	0	0	0	1	5	10	15	20	30	40	60	121
Employment	Part Time	392	0	0	0	2	5	10	15	25	30	45	60	120
Employment	Not Employed	1,129	0	0	0	1	5	10	15	20	30	45	60	121
Education	< High School	358	0	0	0	1	5	10	15	30	30	60	90	121
Education	High School Graduate	1,220	0	0	0	1	5	10	15	25	30	45	60	121
Education	< College	847	0	0	0	1	5	10	15	20	30	30	60	121
Education	College Graduate	550	0	0	1	2	5	10	15	20	30	45	45	60
Education	Post Graduate	446	0	0	0	1	5	8	15	20	30	30	50	120
Census Region	Northeast	907	0	0	0	1	5	5	10	20	30	30	45	121
Census Region	Midwest	929	0	0	0	1	5	5	15	20	30	45	60	121
Census Region	South	1,472	0	0	0	1	4	5	15	20	30	40	60	121
Census Region	West	874	0	0	0	1	3	5	10	20	30	45	45	60
Day of Week	Weekday	2,802	0	0	0	1	4	5	10	20	30	35	50	121
Day of Week	Weekend	1,380	0	0	0	1	4	8	15	20	30	45	60	121
Season	Winter	1,090	0	0	0	1	5	7	15	20	30	45	60	121
Season	Spring	1,119	0	0	0	1	3	5	10	20	30	45	50	120
Season	Summer	1,129	0	0	0	1	3	5	10	20	30	40	52	120
Season	Fall	844	0	0	0	1	5	8	15	20	30	35	60	121
Asthma	No	3,845	0	0	0	1	4	5	15	20	30	40	60	121
Asthma	Yes	322	0	0	0	0	3	5	10	20	30	60	90	121
Angina	No	4,052	0	0	0	1	4	5	15	20	30	40	60	121
Angina	Yes	108	0	0	0	0	5	6	13	20	30	30	30	60
Bronchitis/emphysema	No	3,961	0	0	0	1	4	5	15	20	30	40	60	121
Bronchitis/emphysema	Yes	201	0	0	0	0	4	10	10	30	30	60	88	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-36. Time Spent (minutes/day) Bathing and Showering, Doers Only [a]

								Percentiles							
Group Name	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		6,416	26.1	29.7	0.4	1	705	5	10	20	30	50	60	90	120
Sex	Male	2,930	24.2	31.0	0.6	1	705	5	10	20	30	45	60	75	100
Sex	Female	3,484	27.6	28.4	0.5	1	555	5	10	20	30	60	75	105	135
Sex	Refused	2	20.0	14.1	10.0	10	30	10	10	20	30	30	30	30	30
Age (years)	-	114	29.0	39.0	3.7	2	300	5	10	20	30	60	60	105	275
Age (years)	1 to 4	330	30.0	19.4	1.1	1	170	10	15	30	31	55	60	85	90
Age (years)	5 to 11	438	25.8	35.3	1.7	1	690	5	15	20	30	45	60	60	75
Age (years)	12 to 17	444	23.1	18.7	0.9	1	210	5	10	18	30	45	60	65	90
Age (years)	18 to 64	4,383	25.4	27.2	0.4	1	555	5	10	20	30	50	60	90	120
Age (years)	>64	707	29.9	44.5	1.7	1	705	5	10	20	30	60	85	120	150
Race	White	5,117	25.0	28.5	0.4	1	705	5	10	20	30	45	60	90	115
Race	Black	707	31.5	31.6	1.2	1	295	5	15	22	40	60	80	120	170
Race	Asian	112	28.2	29.8	2.8	5	270	5	15	20	30	60	75	90	90
Race	Some Others	122	30.2	27.3	2.5	1	240	8	15	28	35	50	60	100	150
Race	Hispanic	280	28.8	39.3	2.3	2	546	5	15	20	32	55	63	90	155
Race	Refused	78	27.6	40.3	4.6	3	275	5	10	15	30	60	100	195	275
Hispanic	No	5,835	25.9	28.5	0.4	1	705	5	10	20	30	50	60	90	120
Hispanic	Yes	486	28.8	40.6	1.8	2	570	5	15	20	30	50	60	90	140
Hispanic	DK	33	25.8	16.8	2.9	5	65	10	15	20	30	55	65	65	65
Hispanic	Refused	62	24.3	37.2	4.7	3	275	5	10	15	25	30	60	105	275
Employment	-	1,189	26.1	26.4	0.8	1	690	5	15	20	30	45	60	75	90
Employment	Full Time	3,095	24.1	25.1	0.5	1	555	5	10	15	30	45	60	85	110
Employment	Part Time	558	24.8	23.2	1.0	1	295	5	10	20	30	46	60	90	110
Employment	Not Employed	1,528	30.3	39.9	1.0	1	705	5	10	20	30	60	85	120	155
Employment	Refused	46	30.4	45.2	6.7	3	275	5	10	15	30	55	105	275	275
Education	-	1,330	25.7	26.4	0.7	1	690	5	15	20	30	45	60	75	90
Education	< High School	474	33.3	53.0	2.4	1	570	5	15	21	33	60	85	110	300
Education	High School Graduate	1,758	25.8	23.6	0.6	1	270	5	10	20	30	50	60	90	120
Education	< College	1,288	26.4	27.0	0.8	1	255	5	10	20	30	55	75	105	150
Education	College Graduate	897	25.4	34.8	1.2	1	705	5	10	15	30	50	65	105	135
Education	Post Graduate	669	22.8	23.1	0.9	1	257	5	10	15	30	45	60	85	100
Census Region	Northeast	1,444	25.0	24.3	0.6	1	360	5	10	20	30	50	60	90	105
Census Region	Midwest	1,402	24.6	30.3	0.8	1	570	5	10	15	30	45	60	85	115
Census Region	South	2,266	27.4	26.1	0.5	1	300	5	15	20	30	55	65	100	135
Census Region	West	1,304	26.5	38.8	1.1	1	705	5	10	20	30	48	60	90	133
Day Of Week	Weekday	4,427	25.3	30.3	0.5	1	705	5	10	20	30	45	60	90	115
Day Of Week	Weekend	1,989	27.9	28.2	0.6	1	555	5	15	20	30	60	68	100	130
Season	Winter	1,796	26.9	26.9	0.6	1	546	5	11	20	30	50	60	90	110
Season	Spring	1,645	28.6	41.1	1.0	1	705	5	15	20	30	60	70	115	150
Season	Summer	1,744	23.9	20.7	0.5	1	270	5	10	20	30	45	60	80	100
Season	Fall	1,231	24.7	25.6	0.7	1	340	5	10	17	30	50	60	95	120
Asthma	No	5,912	26.1	30.0	0.4	1	705	5	10	20	30	50	60	90	120
Asthma	Yes	468	26.5	23.0	1.1	1	210	5	15	20	30	46	60	100	120
Asthma	DK	36	23.1	44.1	7.3	3	275	5	10	15	25	30	30	275	275
Angina	No	6,243	26.0	29.0	0.4	1	705	5	10	20	30	50	60	90	120
Angina	Yes	131	31.1	49.5	4.3	5	546	5	15	25	30	50	60	105	131
Angina	DK	42	22.2	40.9	6.3	3	275	5	10	15	25	30	30	275	275
Bronchitis/Emphysema	No	6,112	26.1	29.9	0.4	1	705	5	10	20	30	50	60	90	120
Bronchitis/Emphysema	Yes	268	27.2	22.2	1.4	1	150	5	13	20	30	60	60	95	131
Bronchitis/Emphysema	DK	36	22.5	44.1	7.3	3	275	5	10	15	23	30	30	275	275

- = Indicates missing data.
DK = The respondent replied “don’t know”.
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

[a] Includes baby and child care, personal care services, washing and personal hygiene (bathing, showering, etc.).

Source: U.S. EPA (1996).

Table 16-37. Number of Times Washing the Hands at Specified Daily Frequencies, Children <21 Years

Age (years)	*N*	Number of Times/Day							
		0	1–2	3–5	6–9	10–19	20–29	30+	DK
Birth to <1	37	2	15	12	2	1	1	0	4
1 to <2	53	7	8	23	8	4	0	2	1
2 to <3	67	0	15	39	10	0	1	0	2
3 to <6	187	2	37	101	27	10	1	2	7
6 to <11	245	2	47	131	34	16	3	1	11
11 to <16	258	8	37	128	49	22	5	2	7
16 to <21	232	0	23	115	47	38	4	3	2

N = Number of respondents.
DK = Respondents answered “don’t know.”

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-38. Number of Times Washing the Hands at Specified Daily Frequencies, Doers Only

		Number of Times/Day								
	N	–	0–0	1–2	3–5	6–9	10–19	20–29	30+	DK
All	4,663	38	34	311	1,692	1,106	892	223	178	189
Sex										
Male	2,163	16	19	218	975	487	286	59	49	54
Female	2,498	22	15	92	716	619	606	164	129	135
Refused	2	-	-	1	1	-	-	-	-	-
Age (years)										
-	84	8	-	1	25	15	11	4	5	15
1 to 4	263	-	15	62	125	35	11	2	3	10
5 to 11	348	1	5	61	191	48	21	4	2	15
12 to 17	326	3	6	46	159	64	30	7	2	9
18 to 64	2,972	18	7	131	1,029	760	640	168	143	76
>64	670	8	1	10	163	184	179	38	23	64
Race										
White	3,774	21	28	251	1,377	902	740	181	140	134
Black	463	6	2	30	149	120	85	19	23	29
Asian	77	1	-	5	29	19	12	4	1	6
Some Others	96	-	1	10	39	16	15	8	5	2
Hispanic	193	1	3	14	78	42	31	10	5	9
Refused	60	9	-	1	20	7	9	1	4	9
Hispanic										
No	4,244	27	29	276	1,536	1,022	823	205	164	162
Yes	347	2	5	33	130	76	57	17	10	17
DK	26	-	-	1	12	4	5	1	1	2
Refused	46	9	-	1	14	4	7	-	3	8
Employment										
-	926	4	26	165	471	145	61	13	7	34
Full Time	2,017	12	4	96	707	525	406	116	103	48
Part Time	379	-	-	13	142	101	86	10	15	12
Not Employed	1,309	18	4	36	365	327	334	83	52	90
Refused	32	4	-	1	7	8	5	1	1	5
Education										
-	1,021	13	26	174	507	158	74	13	12	44
< High School	399	2	-	8	120	96	88	26	24	35
High School Graduate	1,253	12	4	56	391	318	298	70	47	57
< College	895	2	3	28	284	246	197	59	48	28
College Graduate	650	6	-	23	238	174	139	28	27	15
Post Graduate	445	3	1	22	152	114	96	27	20	10
Census Region										
Northeast	1,048	9	6	68	404	243	195	55	38	30
Midwest	1,036	5	7	68	373	251	212	41	38	41
South	1,601	14	11	108	559	379	299	79	66	86
West	978	10	10	67	356	233	186	48	36	32
Day of Week										
Weekday	3,156	34	22	199	1,103	764	599	155	147	133
Weekend	1,507	4	12	112	589	342	293	68	31	56
Season										
Winter	1,264	6	10	91	507	286	223	55	51	35
Spring	1,181	13	9	78	406	283	238	60	44	50
Summer	1,275	15	9	78	443	315	232	65	48	70
Fall	943	4	6	64	336	222	199	43	35	34
Asthma										
No	4,287	28	32	283	1,562	1,024	819	207	165	167
Yes	341	1	2	26	126	77	69	16	10	14
DK	35	9	-	2	4	5	4	-	3	8
Angina										
No	4,500	28	34	306	1,652	1,069	851	218	171	171
Yes	125	2	-	3	32	34	36	5	3	10
DK	38	8	-	2	8	3	5	-	4	8
Bronchitis/Emphysema										
No	4,424	27	33	302	1,627	1,040	835	213	172	175
Yes	203	3	1	7	57	61	55	10	3	6
DK	36	8	-	2	8	5	2	-	3	8

- = Indicates missing data.
DK = The respondent replied "don't know".
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-39. Number of Times Swimming in a Month in Freshwater Swimming Pool, Children <21 Years

Age (year)	*N*	Times/Month															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Birth to <1	10	1	4	1	0	0	2	0	0	0	1	0	0	0	0	0	0
1to <2	8	2	3	1	0	1	0	0	1	0	0	0	0	0	0	0	0
2 to <3	18	3	4	1	0	1	1	0	1	1	2	0	2	0	0	1	0
3 to <6	45	5	7	6	5	2	1	1	2	0	2	0	0	1	1	5	0
6 to <11	76	15	10	5	5	5	3	1	3	0	6	0	5	0	0	7	2
11 to <16	66	19	10	6	3	5	4	1	3	1	4	0	1	0	0	2	0
16 to <21	50	6	6	2	6	6	2	2	1	0	5	1	1	0	0	0	0
Age (year)	*N*	Times/Month															
		18	20	23	24	25	26	28	29	30	32	40	42	45	50	60	DK
Birth to <1	10	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1to <2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	18	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
3 to <6	45	0	2	0	0	1	0	0	0	3	1	0	0	0	0	0	0
6 to <11	76	0	3	0	1	1	0	0	0	3	0	0	0	0	1	0	0
11 to <16	66	1	2	0	0	0	0	0	0	2	0	0	0	0	0	1	1
16 to <21	50	0	6	0	0	1	2	0	0	3	0	0	0	0	0	0	0

N = Doer sample size.
DK = Respondents answered "don't know."

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-40. Time Spent (minutes/month) Swimming in Freshwater Swimming Pool, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Birth to <1	10	96	6	-	-	-	-	-	-	-	-	-	-	-	181
1 to <2	7	105	45	-	-	-	-	-	-	-	-	-	-	-	181
2 to <3	18	116	15	16	17	19	27	60	120	181	181	181	181	181	181
3 to <6	42	137	6	8	9	12	40	83	181	181	181	181	181	181	181
6 to <11	72	151	8	13	17	30	60	150	181	181	181	181	181	181	181
11 to <16	65	139	4	8	11	20	30	90	181	181	181	181	181	181	181
16 to <21	50	145	2	3	5	25	39	124	181	181	181	181	181	181	181

N = Doer sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes of 10 or fewer.
Note: A value of 181 for number of minutes signifies that more than 180 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-41. Number of Times Swimming in a Month in Freshwater Swimming Pool, Doers Only

		Times/Month															
	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
All	653	147	94	73	47	42	26	11	26	2	38	3	27	2	2	27	2
Sex																	
Male	300	62	47	37	20	16	17	5	9	2	16	2	13	1	-	16	1
Female	352	85	47	36	27	26	9	6	17	-	22	1	14	1	1	11	1
Refused	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Age (years)																	
-	8	2	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-
1 to 4	63	11	14	7	3	3	4	1	3	1	4	-	2	1	1	2	-
5 to 11	100	16	15	7	9	6	4	2	4	-	7	-	5	-	-	11	2
12 to 17	84	21	13	7	4	8	4	2	3	1	8	-	1	-	-	2	-
18 to 64	360	86	48	50	27	22	11	5	14	-	18	3	15	1	1	10	-
>64	38	11	2	1	3	2	2	1	2	-	1	-	4	-	-	2	-
Race																	
White	555	126	74	64	44	32	25	10	23	2	36	1	23	2	2	21	1
Black	30	8	7	1	-	2	-	-	1	-	-	2	-	-	-	2	1
Asian	13	3	2	2	-	1	-	1	1	-	1	-	1	-	-	-	-
Some Others	12	2	-	2	2	1	-	-	-	-	-	-	-	-	-	4	-
Hispanic	35	5	8	4	1	6	1	-	1	-	1	-	3	-	-	-	-
Refused	8	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hispanic																	
No	591	135	81	68	44	35	25	10	25	2	36	3	24	1	2	24	2
Yes	55	10	11	5	2	6	1	1	1	-	2	-	3	1	-	3	-
DK	2	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Refused	5	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Employment																	
-	243	47	41	21	17	15	12	5	10	2	18	-	8	1	1	15	2
Full Time	240	56	38	38	15	13	10	3	8	-	10	1	8	1	1	6	-
Part Time	43	13	2	4	3	8	-	1	1	-	4	2	2	-	-	1	-
Not Employed	122	30	12	10	12	6	3	2	7	-	6	-	9	-	-	5	-
Refused	5	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Education																	
-	257	51	43	21	18	17	12	5	11	2	19	-	8	1	1	15	2
< High School	16	2	2	3	-	3	1	1	1	-	-	1	-	-	-	-	-
High School Graduate	112	28	15	16	11	6	5	1	1	-	5	1	5	-	1	3	-
<College	104	29	11	11	2	9	2	3	7	-	4	1	7	-	-	3	-
College Graduate	93	22	12	14	10	2	3	-	2	-	5	-	6	-	-	4	-
Post Graduate	71	15	11	8	6	5	3	1	4	-	5	-	1	1	-	2	-
Census Region																	
Northeast	136	32	15	10	16	9	4	1	4	-	13	1	8	1	2	4	-
Midwest	130	35	21	17	8	6	7	2	4	-	9	-	4	1	-	6	-
South	235	46	36	29	13	15	12	7	10	2	10	2	8	-	-	9	2
West	152	34	22	17	10	12	3	1	8	-	6	-	7	-	-	8	-
Day of Week																	
Weekday	445	97	67	52	36	25	15	9	14	1	24	2	18	2	2	21	1
Weekend	208	50	27	21	11	17	11	2	12	1	14	1	9	-	-	6	1
Season																	
Winter	62	19	12	5	3	1	2	-	6	-	2	1	3	-	-	-	-
Spring	174	55	25	19	13	9	7	3	7	-	8	-	7	-	-	2	1
Summer	363	61	45	41	29	26	15	8	12	2	27	2	14	2	2	24	1
Fall	54	12	12	8	2	6	2	-	1	-	1	-	3	-	-	1	-
Asthma																	
No	590	132	81	67	43	38	25	10	24	2	37	3	25	2	2	22	2
Yes	56	14	11	5	4	3	1	1	2	-	1	-	2	-	-	5	-
DK	7	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-
Angina																	
No	639	143	90	73	47	41	26	10	26	2	37	3	27	2	2	26	2
Yes	8	3	1	-	-	1	-	1	-	-	-	-	-	-	-	1	-
DK	6	1	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Bronchitis/Emphysema																	
No	621	138	91	71	45	40	25	10	24	2	38	2	27	2	2	25	2
Yes	26	8	1	2	1	2	1	1	1	-	-	1	-	-	-	2	-
DK	6	1	2	-	1	-	-	-	1	-	-	-	-	-	-	-	-

Table 16-41. Number of Times Swimming in a Month in Freshwater Swimming Pool, Doers Only (continued)

	Times/Month																
	18	20	23	24	25	26	28	29	30	31	32	40	42	45	50	60	DK
All	2	25	1	1	9	2	1	1	26	2	1	2	2	1	1	2	5
Sex																	
Male	-	10	-	-	4	2	1	-	10	2	1	1	1	-	-	-	4
Female	2	15	1	1	5	-	-	1	16	-	-	1	1	1	1	2	1
Refused	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Age (years)																	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to 4	-	2	-	-	-	-	-	1	2	-	1	-	-	-	-	-	-
5 to 11	-	3	-	1	2	-	-	-	5	-	-	-	-	-	1	-	-
12 to 17	1	4	-	-	-	1	-	-	2	-	-	-	-	-	-	1	1
18 to 64	-	15	1	-	7	1	1	-	15	2	-	2	1	1	-	-	3
>64	1	1	-	-	-	-	-	-	2	-	-	-	1	-	-	1	1
Race																	
White	2	19	1	1	9	2	1	1	19	2	1	2	2	-	-	2	5
Black	-	3	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Asian	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Some Others	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Hispanic	-	1	-	-	-	-	-	-	3	-	-	-	-	1	-	-	-
Refused	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Hispanic																	
No	2	23	1	1	9	2	1	1	20	2	1	2	2	-	1	2	4
Yes	-	1	-	-	-	-	-	-	6	-	-	-	-	1	-	-	1
DK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refused	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Employment																	
-	1	9	-	1	2	1	-	1	9	-	1	-	-	-	1	1	1
Full Time	-	8	-	-	5	-	1	-	10	2	-	2	1	1	-	-	2
Part Time	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-
Not Employed	1	7	1	-	1	1	-	-	6	-	-	-	1	-	-	1	1
Refused	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Education																	
-	1	11	-	1	2	2	-	1	9	-	1	-	-	-	1	1	1
< High School	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
High School Graduate	-	6	-	-	1	-	-	-	4	-	-	-	1	-	-	1	1
< College	-	3	1	-	4	-	-	-	4	-	-	-	-	1	-	-	2
College Graduate	-	2	-	-	2	-	-	-	3	2	-	2	1	-	-	-	1
Post Graduate	1	2	-	-	-	-	1	-	5	-	-	-	-	-	-	-	-
Census Region																	
Northeast	-	7	-	-	2	1	-	-	2	1	-	1	1	-	-	-	1
Midwest	-	4	-	-	1	-	-	-	4	-	-	-	1	-	-	-	-
South	2	7	1	1	4	-	1	1	9	1	-	1	-	-	1	1	4
West	-	7	-	-	2	1	-	-	11	-	1	-	-	1	-	1	-
Day of Week																	
Weekday	1	18	1	1	7	1	1	-	19	-	1	1	-	1	1	2	4
Weekend	1	7	-	-	2	1	-	1	7	2	-	1	2	-	-	-	1
Season																	
Winter	1	3	-	-	-	1	1	-	-	1	-	-	1	-	-	-	-
Spring	-	8	-	-	2	-	-	-	3	-	-	-	1	-	1	1	2
Summer	1	10	1	1	7	1	-	1	21	1	1	2	-	1	-	1	3
Fall	-	4	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Asthma																	
No	2	21	1	1	9	1	1	1	23	2	1	2	2	1	-	2	5
Yes	-	3	-	-	-	1	-	-	2	-	-	-	-	-	1	-	-
DK	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Angina																	
No	2	24	1	1	9	2	1	1	26	2	1	2	1	1	1	2	5
Yes	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
DK	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bronchitis/Emphysema																	
No	2	22	1	1	9	2	1	1	23	2	1	2	2	1	1	2	4
Yes	-	2	-	-	-	-	-	-	3	-	-	-	-	-	-	-	1
DK	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- = Indicates missing data.
DK = The respondent replied “don’t know”.
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-42. Time Spent (minutes/month) in Freshwater Swimming Pool, Doers Only

Category	Population Group		Percentiles											
		N	1	2	5	10	25	50	75	90	95	98	99	100
All		640	2	3	10	15	30	60	90	180	181	181	181	181
Sex	Male	295	3	4	8	10	30	45	90	180	181	181	181	181
Sex	Female	345	2	3	10	15	30	60	90	180	181	181	181	181
Age (years)	1 to 4	60	3	3	8	15	20	43	120	180	181	181	181	181
Age (years)	5 to 11	95	2	3	20	30	45	60	120	180	181	181	181	181
Age (years)	12 to 17	83	4	5	15	20	40	60	120	180	181	181	181	181
Age (years)	18 to 64	357	2	3	5	10	20	45	60	120	181	181	181	181
Age (years)	>64	38	5	5	8	10	30	40	60	120	120	181	181	181
Race	White	548	2	3	10	15	30	45	90	180	181	181	181	181
Race	Black	27	10	10	15	30	60	60	150	181	181	181	181	181
Race	Asian	13	4	4	4	20	30	60	60	120	181	181	181	181
Race	Some Others	12	2	2	2	15	25	60	150	181	181	181	181	181
Race	Hispanic	34	3	3	5	10	20	60	120	180	181	181	181	181
Hispanic	No	580	2	3	10	15	30	60	90	180	181	181	181	181
Hispanic	Yes	54	3	5	5	15	30	53	120	180	181	181	181	181
Employment	Full Time	237	3	4	5	10	20	45	60	150	181	181	181	181
Employment	Part Time	43	2	2	5	15	20	30	90	120	181	181	181	181
Employment	Not Employed	121	2	2	8	10	20	45	60	120	180	181	181	181
Education	< High School	16	1	1	1	2	13	30	61	181	181	181	181	181
Education	High School Graduate	111	3	5	8	10	30	60	90	180	181	181	181	181
Education	< College	102	3	3	5	10	20	30	60	120	120	180	181	181
Education	College Graduate	92	2	3	10	15	23	43	61	150	181	181	181	181
Education	Post Graduate	71	5	10	10	10	20	30	60	70	120	180	181	181
Census Region	Northeast	134	4	8	10	15	30	45	120	180	181	181	181	181
Census Region	Midwest	127	5	5	10	15	30	45	90	150	180	181	181	181
Census Region	South	227	2	3	5	15	30	60	120	180	181	181	181	181
Census Region	West	152	2	3	5	10	20	45	61	120	180	181	181	181
Day of Week	Weekday	434	2	3	8	10	30	60	90	180	181	181	181	181
Day of Week	Weekend	206	4	5	10	15	30	60	90	180	181	181	181	181
Season	Winter	60	2	3	5	13	30	53	90	120	181	181	181	181
Season	Spring	171	2	4	5	10	20	40	60	120	180	181	181	181
Season	Summer	356	3	3	10	15	30	60	120	180	181	181	181	181
Season	Fall	53	2	10	10	10	20	45	70	180	181	181	181	181
Asthma	No	578	2	3	10	15	30	55	90	180	181	181	181	181
Asthma	Yes	55	2	3	4	10	30	60	120	180	181	181	181	181
Angina	No	626	2	3	10	15	30	60	90	180	181	181	181	181
Angina	Yes	8	15	15	15	15	25	43	75	120	120	120	120	120
Bronchitis/Emphysema	No	608	3	3	10	15	30	60	90	180	181	181	181	181
Bronchitis/Emphysema	Yes	26	2	2	5	5	15	43	60	181	181	181	181	181

N = Doer sample size.
Note: A Value of 181 for number of minutes signifies that more than 180 minutes were spent.

Source: U.S. EPA (1996).

Table 16-43. Time Spent (minutes/day) Playing on Dirt, Sand/Gravel, or Grass Whole Population and Doers Only, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Playing on Dirt—Whole Population															
Birth to <1	11	15	0	0	0	0	0	0	0	10	20	71	101	111	121
1 to <2	37	20	0	0	0	0	0	0	0	10	84	121	121	121	121
2 to <3	61	18	0	0	0	0	0	0	0	20	60	120	121	121	121
3 to <6	179	29	0	0	0	0	0	0	0	59	120	121	121	121	121
6 to <11	98	28	0	0	0	0	0	0	0	60	120	121	121	121	121
11 to <16	35	25	0	0	0	0	0	0	1	30	77	120	120	121	121
16 to <21	7	9	0	-	-	-	-	-	-	-	-	-	-	-	30
Playing on Dirt—Doers Only															
Birth to <1	5	33	2	-	-	-	-	-	-	-	-	-	-	-	121
1 to <2	13	56	5	5	5	5	6	10	45	120	121	121	121	121	121
2 to <3	24	47	5	5	5	5	7	15	30	60	121	121	121	121	121
3 to <6	82	63	1	1	1	1	6	30	60	120	121	121	121	121	121
6 to <11	44	63	2	3	5	10	15	30	60	120	121	121	121	121	121
11 to <16	18	49	1	2	2	4	9	19	30	60	120	120	121	121	121
16 to <21	2	30	30	-	-	-	-	-	-	-	-	-	-	-	30
Playing on Sand/Gravel—Whole Population															
Birth to <1	10	4	0	-	-	-	-	-	-	-	-	-	-	-	20
1 to <2	37	17	0	0	0	0	0	0	0	30	60	84	121	121	121
2 to <3	58	24	0	0	0	0	0	0	0	30	120	121	121	121	121
3 to <6	186	30	0	0	0	0	0	0	2	60	120	121	121	121	121
6 to <11	101	30	0	0	0	0	0	0	0	60	120	121	121	121	121
11 to <16	36	30	0	0	0	0	0	0	0	38	120	121	121	121	121
16 to <21	8	42	0	-	-	-	-	-	-	-	-	-	-	-	121
Playing on Sand/Gravel—Doers Only															
Birth to <1	2	18	15	-	-	-	-	-	-	-	-	-	-	-	20
1 to <2	15	43	5	5	5	5	7	15	30	60	103	121	121	121	121
2 to <3	26	53	1	1	1	1	3	10	30	120	121	121	121	121	121
3 to <6	93	60	3	3	3	5	8	25	60	90	121	121	121	121	121
6 to <11	46	67	5	7	10	11	15	30	60	120	121	121	121	121	121
11 to <16	16	67	1	3	5	12	15	26	60	120	121	121	121	121	121
16 to <21	4	83	30	-	-	-	-	-	-	-	-	-	-	-	121
Playing on Grass—Whole Population															
Birth to <1	11	43	0	0	0	0	0	2	30	73	121	121	121	121	121
1 to <2	38	62	0	0	0	0	9	16	60	120	121	121	121	121	121
2 to <3	59	55	0	0	0	0	1	15	30	120	121	121	121	121	121
3 to <6	180	69	0	0	0	0	0	28	60	121	121	121	121	121	121
6 to <11	99	62	0	0	0	0	0	20	60	120	121	121	121	121	121
11 to <16	36	67	0	0	0	0	1	30	60	120	121	121	121	121	121
16 to <21	8	45	0	-	-	-	-	-	-	-	-	-	-	-	120
Playing on Grass—Doers Only															
Birth to <1	9	52	1	-	-	-	-	-	-	-	-	-	-	-	121
1 to <2	35	68	5	7	8	10	15	25	60	120	121	121	121	121	121
2 to <3	53	62	1	2	3	3	5	20	60	120	121	121	121	121	121
3 to <6	157	79	1	2	2	10	15	60	70	121	121	121	121	121	121
6 to <11	85	73	1	5	9	11	17	30	60	120	121	121	121	121	121
11 to <16	32	75	1	5	10	23	30	30	60	120	121	121	121	121	121
16 to <21	6	60	15	-	-	-	-	-	-	-	-	-	-	-	120

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes of 10 or fewer.
Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent.
Source: U.S. EPA re-analysis of source data from U.S. EPA (1996)

Table 16-44. Number of Minutes Spent Playing or Working on Selected Outdoor Surfaces, Doers Only

Dirt (minutes/day)

			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		647	0	0	0	0	0	0	30	100	121	121	121	121
Sex	Male	326	0	0	0	0	0	0	30	120	121	121	121	121
Sex	Female	320	0	0	0	0	0	0	30	60	121	121	121	121
Age (years)	1 to 4	205	0	0	0	0	0	0	30	120	121	121	121	121
Age (years)	5 to 11	185	0	0	0	0	0	0	30	120	121	121	121	121
Age (years)	12 to 17	38	0	0	0	0	0	1	30	60	120	120	120	120
Age (years)	18 to 64	214	0	0	0	0	0	0	15	60	120	121	121	121
Age (years)	>64	2	0	0	0	0	0	0	0	0	0	0	0	0
Race	White	528	0	0	0	0	0	0	30	120	121	121	121	121
Race	Black	60	0	0	0	0	0	0	30	74	120	121	121	121
Race	Asian	5	0	0	0	0	0	30	30	121	121	121	121	121
Race	Some Others	16	0	0	0	0	0	0	20	40	60	60	60	60
Race	Hispanic	36	0	0	0	0	0	1	60	120	121	121	121	121
Hispanic	No	574	0	0	0	0	0	0	30	90	121	121	121	121
Hispanic	Yes	69	0	0	0	0	0	1	30	120	121	121	121	121
Employment	Full Time	138	0	0	0	0	0	0	15	60	120	121	121	121
Employment	Part Time	25	0	0	0	0	0	0	10	60	60	121	121	121
Employment	Not Employed	52	0	0	0	0	0	0	10	60	60	121	121	121
Education	< High School	17	0	0	0	0	0	0	60	121	121	121	121	121
Education	High School Graduate	67	0	0	0	0	0	0	10	60	88	120	121	121
Education	< College	62	0	0	0	0	0	0	15	60	60	121	121	121
Education	College Graduate	51	0	0	0	0	0	0	15	30	60	121	121	121
Education	Post Graduate	18	0	0	0	0	0	0	0	60	120	120	120	120
Census Region	Northeast	118	0	0	0	0	0	0	30	60	121	121	121	121
Census Region	Midwest	116	0	0	0	0	0	0	20	60	120	121	121	121
Census Region	South	250	0	0	0	0	0	0	30	90	121	121	121	121
Census Region	West	163	0	0	0	0	0	1	60	121	121	121	121	121
Day of Week	Weekday	406	0	0	0	0	0	0	30	88	121	121	121	121
Day of Week	Weekend	241	0	0	0	0	0	0	30	120	121	121	121	121
Season	Winter	93	0	0	0	0	0	0	45	121	121	121	121	121
Season	Spring	230	0	0	0	0	0	0	30	105	121	121	121	121
Season	Summer	245	0	0	0	0	0	0	30	90	121	121	121	121
Season	Fall	79	0	0	0	0	0	0	10	60	120	121	121	121
Asthma	No	590	0	0	0	0	0	0	30	110	121	121	121	121
Asthma	Yes	56	0	0	0	0	0	10	60	60	121	121	121	121
Angina	No	646	0	0	0	0	0	0	30	100	121	121	121	121
Bronchitis/Emphysema	No	627	0	0	0	0	0	0	30	120	121	121	121	121
Bronchitis/Emphysema	Yes	20	0	0	0	0	0	0	38	60	90.5	121	121	121

Table 16-44. Number of Minutes Spent Playing on Selected Outdoor Surfaces, Doers Only (continued)

Sand or Gravel (minutes/day)

			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		659	0	0	0	0	0	0	45	120	121	121	121	121
Sex	Male	334	0	0	0	0	0	0	45	120	121	121	121	121
Sex	Female	324	0	0	0	0	0	1	60	120	121	121	121	121
Age (years)	1 to 4	203	0	0	0	0	0	0	30	120	121	121	121	121
Age (years)	5 to 11	193	0	0	0	0	0	3	60	121	121	121	121	121
Age (years)	12 to 17	40	0	0	0	0	0	0	45	120	121	121	121	121
Age (years)	18 to 64	219	0	0	0	0	0	0	45	120	121	121	121	121
Age (years)	>64	2	0	0	0	0	0	0	0	0	0	0	0	0
Race	White	534	0	0	0	0	0	0	50	120	121	121	121	121
Race	Black	64	0	0	0	0	0	0	15	120	121	121	121	121
Race	Asian	5	0	0	0	0	0	30	60	121	121	121	121	121
Race	Some Others	15	0	0	0	0	0	0	60	121	121	121	121	121
Race	Hispanic	39	0	0	0	0	0	15	60	121	121	121	121	121
Hispanic	No	583	0	0	0	0	0	0	45	120	121	121	121	121
Hispanic	Yes	72	0	0	0	0	0	2	60	120	121	121	121	121
Employment	Full Time	140	0	0	0	0	0	0	45	105	121	121	121	121
Employment	Part Time	27	0	0	0	0	0	10	60	121	121	121	121	121
Employment	Not Employed	53	0	0	0	0	0	0	30	120	121	121	121	121
Education	< High School	17	0	0	0	0	0	0	60	121	121	121	121	121
Education	High School Graduate	69	0	0	0	0	0	0	30	121	121	121	121	121
Education	< College	64	0	0	0	0	0	0	38	120	121	121	121	121
Education	College Graduate	50	0	0	0	0	0	0	30	60	60	121	121	121
Education	Post Graduate	20	0	0	0	0	0	15	60	120	120	120	120	120
Census Region	Northeast	116	0	0	0	0	0	0	60	120	121	121	121	121
Census Region	Midwest	122	0	0	0	0	0	0	30	60	121	121	121	121
Census Region	South	256	0	0	0	0	0	0	45	120	121	121	121	121
Census Region	West	165	0	0	0	0	0	0	60	121	121	121	121	121
Day of Week	Weekday	410	0	0	0	0	0	0	40	120	121	121	121	121
Day of Week	Weekend	249	0	0	0	0	0	0	60	121	121	121	121	121
Season	Winter	97	0	0	0	0	0	5	45	120	121	121	121	121
Season	Spring	232	0	0	0	0	0	1	53	120	121	121	121	121
Season	Summer	250	0	0	0	0	0	0	60	120	121	121	121	121
Season	Fall	80	0	0	0	0	0	0	30	105	121	121	121	121
Asthma	No	600	0	0	0	0	0	0	45	120	121	121	121	121
Asthma	Yes	58	0	0	0	0	0	3	60	120	121	121	121	121
Angina	No	659	0	0	0	0	0	0	45	120	121	121	121	121
Bronchitis/emphysema	No	638	0	0	0	0	0	0	45	120	121	121	121	121
Bronchitis/emphysema	Yes	21	0	0	0	0	0	30	60	121	121	121	121	121

Table 16-44. Number of Minutes Spent Playing on Selected Outdoor Surfaces, Doers Only (continued)

Grass (minutes/day)														
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		657	0	0	0	0	20	60	120	121	121	121	121	121
Sex	Male	327	0	0	0	0	20	60	121	121	121	121	121	121
Sex	Female	329	0	0	0	0	15	60	120	121	121	121	121	121
Age (years)	1 to 4	206	0	0	0	0	15	60	120	121	121	121	121	121
Age (years)	5 to 11	185	0	0	0	0	30	60	121	121	121	121	121	121
Age (years)	12 to 17	39	0	0	0	0	30	60	120	121	121	121	121	121
Age (years)	18 to 64	221	0	0	0	0	20	60	120	121	121	121	121	121
Age (years)	>64	3	30	30	30	30	30	121	121	121	121	121	121	121
Race	White	532	0	0	0	0	20	60	121	121	121	121	121	121
Race	Black	65	0	0	0	3	20	58	90	121	121	121	121	121
Race	Asian	5	10	10	10	10	30	30	30	121	121	121	121	121
Race	Some Others	16	0	0	0	0	10	60	120	121	121	121	121	121
Race	Hispanic	37	0	0	0	0	30	60	110	121	121	121	121	121
Hispanic	No	581	0	0	0	0	20	60	121	121	121	121	121	121
Hispanic	Yes	72	0	0	0	0	10	35	100	121	121	121	121	121
Employment	Full Time	141	0	0	0	0	20	60	121	121	121	121	121	121
Employment	Part Time	27	0	0	0	0	15	60	120	121	121	121	121	121
Employment	Not Employed	55	0	0	0	5	23	60	121	121	121	121	121	121
Education	< High School	20	0	0	0	5	30	60	121	121	121	121	121	121
Education	High School Graduate	69	0	0	0	0	15	60	121	121	121	121	121	121
Education	< College	64	0	0	0	0	18	47	60	121	121	121	121	121
Education	College Graduate	51	0	0	0	1	30	60	121	121	121	121	121	121
Education	Post Graduate	19	0	0	0	0	25	60	121	121	121	121	121	121
Census Region	Northeast	119	0	0	0	0	30	60	121	121	121	121	121	121
Census Region	Midwest	120	0	0	0	8	30	60	121	121	121	121	121	121
Census Region	South	252	0	0	0	1	20	60	120	121	121	121	121	121
Census Region	West	166	0	0	0	0	10	45	120	121	121	121	121	121
Day of Week	Weekday	412	0	0	0	0	15	60	120	121	121	121	121	121
Day of Week	Weekend	245	0	0	0	1	30	60	121	121	121	121	121	121
Season	Winter	95	0	0	0	0	4	30	120	121	121	121	121	121
Season	Spring	231	0	0	0	1	30	60	121	121	121	121	121	121
Season	Summer	250	0	0	0	2	30	60	121	121	121	121	121	121
Season	Fall	81	0	0	0	0	10	35	120	121	121	121	121	121
Asthma	No	600	0	0	0	0	20	60	120	121	121	121	121	121
Asthma	Yes	56	0	0	0	0	23	60	120.5	121	121	121	121	121
Angina	No	656	0	0	0	0	20	60	120	121	121	121	121	121
Bronchitis/Emphysema	No	636	0	0	0	0	20	60	120	121	121	121	121	121
Bronchitis/Emphysema	Yes	21	0	0	0	0	30	60	121	121	121	121	121	121

Table 16-44. Number of Minutes Spent Playing on Selected Outdoor Surfaces, Doers Only (continued)

Working With Soil in a Garden or Other Circumstances (hours/month)

			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		4,572	0	0	0	0	0	0	3	15	40	88	160	320
Gender	Male	2,125	0	0	0	0	0	0	3	20	50	150	230	320
Gender	Female	2,445	0	0	0	0	0	0	2	12	30	60	90	320
Age (years)	1 to 4	256	0	0	0	0	0	0	1	7	20	60	120	150
Age (years)	5 to 11	341	0	0	0	0	0	0	2	10	20	50	60	320
Age (years)	12 to 17	321	0	0	0	0	0	0	1	5	10	40	60	200
Age (years)	18 to 64	2,935	0	0	0	0	0	0	3	16	40	90	200	320
Age (years)	> 64	646	0	0	0	0	0	0	3	25	60	90	160	300
Race	White	3,715	0	0	0	0	0	0	3	16	40	88	160	320
Race	Black	454	0	0	0	0	0	0	0	8	30	60	160	320
Race	Asian	76	0	0	0	0	0	0	2	6	15	24	40	40
Race	Some Others	94	0	0	0	0	0	0	2	15	60	150	200	200
Race	Hispanic	187	0	0	0	0	0	0	2	12	25	90	320	320
Hispanic	No	4,179	0	0	0	0	0	0	3	15	40	80	180	320
Hispanic	Yes	336	0	0	0	0	0	0	2	15	32	90	120	320
Employment	Full Time	1,999	0	0	0	0	0	0	4	20	45	144	240	320
Employment	Part Time	375	0	0	0	0	0	0	3	12	32	90	120	320
Employment	Not Employed	1,270	0	0	0	0	0	0	3	20	45	64	100	320
Education	< High School	381	0	0	0	0	0	0	2	16	60	120	160	320
Education	High School Grad	1,228	0	0	0	0	0	0	4	20	50	120	200	320
Education	< College	884	0	0	0	0	0	0	4	20	40	90	240	320
Education	College Grad.	649	0	0	0	0	0	0	3	16	40	70	100	320
Education	Post Grad.	443	0	0	0	0	0	0	5	20	40	61	90	320
Census Region	Northeast	1,031	0	0	0	0	0	0	1	10	30	90	120	320
Census Region	Midwest	1,013	0	0	0	0	0	0	2	10	30	60	120	320
Census Region	South	1,566	0	0	0	0	0	0	3	18	40	90	180	320
Census Region	West	962	0	0	0	0	0	0	5	20	50	90	200	320
Day of Week	Weekday	3,094	0	0	0	0	0	0	3	15	40	80	160	320
Day of Week	Weekend	1,478	0	0	0	0	0	0	3	15	40	90	150	320
Season	Winter	1,255	0	0	0	0	0	0	0	4	12	50	90	320
Season	Spring	1,152	0	0	0	0	0	0	5	20	45	110	200	320
Season	Summer	1,236	0	0	0	0	0	0	5	25	50	96	160	320
Season	Fall	929	0	0	0	0	0	0	3	10	30	88	180	320
Asthma	No	4,217	0	0	0	0	0	0	3	15	40	90	160	320
Asthma	Yes	335	0	0	0	0	0	0	2	12	30	60	80	320
Angina	No	4,426	0	0	0	0	0	0	3	15	40	88	160	320
Angina	Yes	121	0	0	0	0	0	0	2	7	24	60	110	120
Bronchitis/Emphysema	No	4,352	0	0	0	0	0	0	3	15	40	88	180	320
Bronchitis/Emphysema	Yes	198	0	0	0	0	0	0	1	7	24	60	80	100

N = Doer sample size.

NOTE: A value of "121" for number of minutes signifies that more than 120 minutes were spent.

Source: U.S. EPA (1996).

Table 16-45. Time Spent (minutes/day) Working or Being Near Excessive Dust in the Air, Children <21 Years

Age (years)	*N*	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Birth to <1	2	63	5	-	-	-	-	-	-	-	-	-	-	-	121
1 to <2	5	44	0	-	-	-	-	-	-	-	-	-	-	-	121
2 to <3	1	121	121	-	-	-	-	-	-	-	-	-	-	-	121
3 to <6	15	63	0	0	1	1	2	8	60	121	121	121	121	121	121
6 to <11	12	60	0	0	0	1	2	5	45	121	121	121	121	121	121
11 to <16	14	53	0	0	0	1	2	6	38	113	121	121	121	121	121
16 to <21	14	65	2	2	3	4	7	16	53	121	121	121	121	121	121

N = Doer sample size.
Min = Minimum.
Max = Maximum.
\- = Percentiles were not calculated for sample sizes of 10 or fewer.
Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA (1996).

Table 16-46. Time Spent (minutes/day) Working or Being Near Excessive Dust in the Air, Doers Only

Category	Population Group	*N*	Percentiles											
			1	2	5	10	25	50	75	90	95	98	99	100
All		679	0	2	5	7	30	121	121	121	121	121	121	121
Sex	Male	341	1	2	5	8	30	121	121	121	121	121	121	121
Sex	Female	338	0	2	5	5	30	121	121	121	121	121	121	121
Age (years)	1 to 4	22	0	0	0	2	5	75	121	121	121	121	121	121
Age (years)	5 to 11	50	0	1	2	4	15	75	121	121	121	121	121	121
Age (years)	12 to 17	52	0	1	2	5	5	20	120	121	121	121	121	121
Age (years)	18 to 64	513	2	5	5	10	30	121	121	121	121	121	121	121
Age (years)	>64	38	2	2	2	5	35	106	121	121	121	121	121	121
Race	White	556	0	2	5	8	30	121	121	121	121	121	121	121
Race	Black	66	1	3	5	5	20	121	121	121	121	121	121	121
Race	Asian	7	20	20	20	20	60	90	121	121	121	121	121	121
Race	Some Others	15	5	5	5	10	60	120	121	121	121	121	121	121
Race	Hispanic	29	3	3	5	7	20	121	121	121	121	121	121	121
Hispanic	No	611	0	2	5	5	30	121	121	121	121	121	121	121
Hispanic	Yes	57	0	3	3	10	30	121	121	121	121	121	121	121
Employment	Full Time	368	2	5	7	15	38	121	121	121	121	121	121	121
Employment	Part Time	66	0	2	5	5	20	120	121	121	121	121	121	121
Employment	Not Employed	122	0	2	5	8	30	121	121	121	121	121	121	121
Education	< High School	52	2	5	5	7	35	121	121	121	121	121	121	121
Education	High School Graduate	199	0	0	5	10	30	121	121	121	121	121	121	121
Education	< College	140	5	5	10	20	60	121	121	121	121	121	121	121
Education	College Graduate	82	1	2	5	15	30	121	121	121	121	121	121	121
Education	Post Graduate	76	3	5	5	10	38	121	121	121	121	121	121	121
Census Region	Northeast	138	0	0	5	5	20	121	121	121	121	121	121	121
Census Region	Midwest	145	2	2	5	10	30	121	121	121	121	121	121	121
Census Region	South	227	1	2	5	5	30	121	121	121	121	121	121	121
Census Region	West	169	0	3	5	10	30	120	121	121	121	121	121	121
Day of Week	Weekday	471	0	1	5	7	30	121	121	121	121	121	121	121
Day of Week	Weekend	208	2	2	5	5	30	121	121	121	121	121	121	121
Season	Winter	154	0	0	5	5	30	121	121	121	121	121	121	121
Season	Spring	193	0	1	3	5	20	121	121	121	121	121	121	121
Season	Summer	193	2	2	5	10	30	121	121	121	121	121	121	121
Season	Fall	139	3	5	5	10	30	121	121	121	121	121	121	121
Asthma	No	606	0	2	5	5	30	121	121	121	121	121	121	121
Asthma	Yes	73	0	3	5	10	30	121	121	121	121	121	121	121
Angina	No	662	0	2	5	7	30	121	121	121	121	121	121	121
Angina	Yes	15	3	3	3	30	60	121	121	121	121	121	121	121
Bronchitis/Emphysema	No	637	0	2	5	7	30	121	121	121	121	121	121	121
Bronchitis/Emphysema	Yes	41	0	0	5	5	30	121	121	121	121	121	121	121

N = Doer sample size.
Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent.

Source: U.S. EPA (1996).

Table 16-47. Number of Times Floors Were Swept or Vacuumed at Specified Frequencies by the Number of Respondents

	N	Number of Times						
		Almost Every Day	3-5/week	1-2/week	1-2/month	< Often	Never	DK
All	4,663	921	1,108	2,178	373	48	10	25
Gender								
Male	2,163	415	520	976	201	27	5	19
Female	2,498	505	588	1,201	172	21	5	6
Refused	2	1	0	1	0	0	0	0
Age (years)								
-	84	16	11	41	12	3	0	1
1 to 4	263	96	74	88	4	0	0	1
5 to 11	348	115	107	120	6	0	0	0
12 to 17	326	82	83	144	15	2	0	0
18 to 64	2,972	524	723	1,420	252	34	6	13
> 64	670	88	110	365	84	9	4	10
Race								
White	3,774	641	879	1,868	324	36	8	18
Black	463	167	115	150	19	5	2	5
Asian	77	11	15	39	8	3	0	1
Some Others	96	26	29	32	8	1	0	0
Hispanic	193	68	61	55	7	2	0	0
Refused	60	8	9	34	7	1	0	1
Hispanic								
No	4,244	799	988	2,035	345	43	9	25
Yes	347	106	107	110	21	3	0	0
DK	26	8	3	11	2	1	1	0
Refused	46	8	10	22	5	1	0	0
Employment								
-	926	290	267	342	24	2	0	1
Full Time	2,017	291	486	1,018	184	27	2	9
Part Time	379	82	82	177	34	1	0	3
Not Employed	1,309	256	263	626	127	18	8	11
Refused	32	2	10	15	4	0	0	1
Education								
-	1,021	314	285	384	31	4	0	3
< High School	399	110	91	162	20	6	2	8
High School Graduate	1,253	269	302	591	69	12	3	7
< College	895	130	223	438	93	8	2	1
College Graduate	650	64	132	346	93	9	3	3
Post Graduate	445	34	75	257	67	9	0	3
Census Region								
Northeast	1,048	236	230	484	83	8	2	5
Midwest	1,036	156	249	527	86	10	2	6
South	1,601	376	403	707	93	11	2	9
West	978	153	226	460	111	19	4	5
Day of Week								
Weekday	3156	631	765	1,458	248	33	5	16
Weekend	1507	290	343	720	125	15	5	9
Season								
Winter	1,264	268	309	557	105	15	2	8
Spring	1,181	217	286	560	96	12	3	7
Summer	1,275	251	312	596	94	13	1	8
Fall	943	185	201	465	78	8	4	2
Asthma								
No	4,287	821	1,013	2,030	351	39	10	23
Yes	341	95	88	133	17	7	0	1
DK	35	5	7	15	5	2	0	1
Angina								
No	4,500	892	1,080	2,098	352	44	10	24
Yes	125	21	23	63	16	2	0	0
DK	38	8	5	17	5	2	0	1
Bronchitis/emphysema								
No	4,424	871	1,064	2,063	349	44	9	24
Yes	203	45	39	99	17	2	1	0
DK	36	5	5	16	7	2	0	1

N = Sample size.
DK = The respondent replied "don't know."
- = Indicates missing data.
Refused = respondent refused to answer.

Source: U.S. EPA (1996).

Table 16-48. Number of Days Since the Floor Area in the Home Was Swept or Vacuumed by the Number of Respondents

		Number of Days Since That Area Was Swept-Vacuumed													
	N	0	Swept-Vacuumed Yes'day	1	2	3	4	5	6	7	8	10	14	>2 Weeks	DK
All	9,386	8,112	550	278	189	85	63	31	17	26	2	1	5	16	11
Gender															
Male	4,294	3,688	245	136	100	35	37	19	8	10	1	0	3	7	5
Female	5,088	4,421	304	142	89	50	26	12	9	16	1	1	2	9	6
Refused	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)															
-	187	180	1	0	3	1	0	0	0	0	0	0	0	1	1
1 to 4	499	67	199	93	54	24	19	17	9	7	0	1	2	6	1
5 to 11	703	393	121	70	50	23	22	8	2	4	1	0	2	2	5
12 to 17	589	533	30	12	6	3	0	0	1	2	0	0	0	2	0
18 to 64	6,059	5,,592	198	102	76	34	22	6	5	13	1	0	1	5	4
> 64	1,349	1347	1	1	0	0	0	0	0	0	0	0	0	0	0
Race															
White	7,591	6,586	398	232	152	72	55	29	14	24	2	1	5	13	8
Black	945	825	72	18	17	7	3	1	2	0	0	0	0	0	0
Asian	157	138	5	6	2	2	1	0	0	1	0	0	0	1	1
Some Others	182	141	21	7	9	2	1	0	0	0	0	0	0	1	0
Hispanic	385	300	52	15	9	2	2	0	1	1	0	0	0	1	2
Refused	126	122	2	0	0	0	1	1	0	0	0	0	0	0	0
Hispanic															
No	8,534	7,421	460	248	170	80	57	29	15	24	2	1	5	14	8
Yes	702	549	88	29	17	5	4	2	2	2	0	0	0	1	3
Dk	47	42	1	1	1	0	1	0	0	0	0	0	0	1	0
Refused	103	100	1	0	1	0	1	0	0	0	0	0	0	0	0
Employment															
-	1,773	974	349	175	112	50	41	25	12	13	1	1	4	9	7
Full Time	4,096	3,826	96	64	50	21	18	6	4	6	1	0	0	4	0
Part Time	802	741	28	10	8	6	2	0	0	4	0	0	1	1	1
Not Employed	2,644	2502	77	29	18	8	2	0	1	3	0	0	0	1	3
Refused	71	,69	0	0	1	0	0	0	0	0	0	0	0	1	0
Education															
-	1,968	1,162	353	175	114	50	41	25	12	13	1	1	4	10	7
< High School	834	793	24	13	2	1	0	0	0	0	0	0	0	0	1
High School Graduate	2,612	2,447	76	39	26	9	7	1	2	0	1	0	0	2	2
< College	1,801	1,681	55	25	18	10	6	0	1	3	0	0	0	2	0
College Graduate	1,247	1,155	28	19	17	10	5	3	1	7	0	0	0	1	1
Post Graduate	924	874	14	7	12	5	4	2	1	3	0	0	1	1	0
Census Region															
Northeast	2,075	1,793	129	65	35	18	4	9	9	6	0	0	0	5	2
Midwest	2,102	1,826	108	59	47	21	17	7	2	6	2	1	2	2	2
South	3,243	2,805	193	87	75	26	27	8	3	8	0	0	2	5	4
West	1,966	1,688	120	67	32	20	15	7	3	6	0	0	1	4	3
Day of Week															
Weekday	6,316	5,487	366	160	125	57	51	18	13	15	2	1	4	11	6
Weekend	3,070	2,625	184	118	64	28	12	13	4	11	0	0	1	5	5
Season															
Winter	2,524	2,144	162	79	61	27	17	7	3	13	0	0	1	5	5
Spring	2,438	2,112	121	90	48	19	19	9	7	4	0	0	2	5	2
Summer	2,536	2,187	167	68	41	26	19	12	3	3	0	1	2	4	3
Fall	1,888	1,669	100	41	39	13	8	3	4	6	2	0	0	2	1
Asthma															
No	8,629	7,455	502	262	171	80	59	30	13	22	2	1	5	16	11
Yes	694	596	48	15	17	5	4	1	4	4	0	0	0	0	0
Dk	63	61	0	1	1	0	0	0	0	0	0	0	0	0	0

Table 16-48. Number of Days Since the Floor Area in the Home Was Swept or Vacuumed by the Number of Respondents (continued)

		Number of Days Since That Area Was Swept-Vacuumed													
	N	0	Swept-Vacuumed Yes'day	1	2	3	4	5	6	7	8	10	14	>2 Weeks	DK
Angina															
No	9,061	7,793	547	277	189	83	63	31	17	26	2	1	5	16	11
Yes	250	246	2	1	0	1	0	0	0	0	0	0	0	0	0
Dk	75	73	1	0	0	1	0	0	0	0	0	0	0	0	0
Bronchitis/emphysema															
No	8,882	7,645	536	268	182	84	61	31	17	25	2	1	5	15	10
Yes	433	397	13	10	7	1	2	0	0	1	0	0	0	1	1
Dk	71	70	1	0	0	0	0	0	0	0	0	0	0	0	0

N = Sample size.
DK = The respondent replied “don't know.”
- = Indicates missing data.
Refused = Respondent refused to answer.

Source: U.S. EPA (1996).

Table 16-49. Time Spent (minutes/day) With Smokers Present, Children <21 Years

Age (year)	*N*	Mean	SD	SE	Min	Percentiles								Max
						5	25	50	75	90	95	98	99	
1 to 4	155	367	325	26	5	30	90	273	570	825	1,010	1,140	1,305	1,440
5 to 11	224	318	314	21	1	25	105	190	475	775	1,050	1,210	1,250	1,440
12 to 17	256	246	244	15	1	10	60	165	360	595	774	864	1,020	1,260

N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum.
Max = Maximum.

Source: U.S. EPA (1996).

Table 16-50. Time Spent (minutes/day) With Smokers Present, Doers Only

								Percentiles							
Category	Population Group	*N*	Mean	SD	SE	Min	Max	5	25	50	75	90	95	98	99
All		4,005	381.5	300.5	4.7	1	1,440	30	120	319	595	815	925	1,060	1,170
Sex	Male	1,967	411.4	313.0	7.1	1	1,440	30	135	355	638	855	965	1,105	1,217
Sex	Female	2,035	352.8	285.1	6.3	1	1,440	29	105	285	545	780	870	995	1,110
Sex	Refused	3	283.3	188.2	108.6	105	480	105	105	265	480	480	480	480	480
Age (years)	-	54	386.3	305.4	41.6	5	1,440	25	105	370	555	780	995	995	1,440
Age (years)	1 to 4	155	366.6	324.5	26.1	5	1,440	30	90	273	570	825	1,010	1,140	1,305
Age (years)	5 to 11	224	318.1	314.0	21.0	1	1,440	25	105	190	475	775	1,050	1,210	1,250
Age (years)	12 to 17	256	245.8	243.6	15.2	1	1,260	10	60	165	360	595	774	864	1,020
Age (years)	18 to 64	2,976	403.1	299.4	5.5	2	1,440	30	135	355	625	830	930	1,047	1,150
Age (years)	>64	340	342.7	292.2	15.8	5	1,440	30	100	240	540	798	880	1,015	1,205
Race	White	3,279	389.2	303.0	5.3	1	1,440	30	120	330	610	825	930	1,060	1,190
Race	Black	395	360.0	288.0	14.5	2	1,440	22	118	300	538	775	905	1,080	1,160
Race	Asian	48	262.1	209.9	30.3	5	800	10	64	213	413	560	630	800	800
Race	Some Others	79	420.7	339.2	38.2	10	1,328	30	135	310	655	885	1,140	1,305	1,328
Race	Hispanic	165	292.6	250.2	19.5	5	1,095	15	75	220	475	660	800	845	945
Race	Refused	39	393.5	325.3	52.1	25	1,110	30	115	290	655	865	1,040	1,110	1,110
Hispanic	No	3,666	384.9	301.2	5.0	1	1,440	30	120	324	600	822	930	1,060	1,170
Hispanic	Yes	288	336.2	280.9	16.6	1	1,440	20	115	252	512	760	850	1,010	1,260
Hispanic	DK	18	369.8	371.5	87.6	15	1,440	15	90	220	600	760	1,440	1,440	1,440
Hispanic	Refused	33	403.4	322.8	56.2	25	1,110	30	120	325	655	840	1,040	1,110	1,110
Employment	-	624	301.7	295.5	11.8	1	1,440	15	75	190	450	735	900	1,140	1,230
Employment	Full Time	2,042	405.9	296.3	6.6	2	1,440	30	135	365	625	835	925	1,005	1,110
Employment	Part Time	381	378.0	291.1	14.9	5	1,440	30	135	325	585	805	915	1,080	1,245
Employment	Not Employed	935	383.8	308.7	10.1	3	1,440	30	120	310	600	825	930	1,110	1,290
Employment	Refused	23	342.0	254.2	53.0	25	925	30	120	325	450	715	885	925	925
Education	-	704	308.6	292.8	11.0	1	1,440	15	88	205	465	741	900	1,095	1,217
Education	< High School	377	497.7	317.8	16.4	2	1,440	40	225	465	775	905	990	1,120	1,369
Education	High School Graduate	1,315	425.7	301.7	8.3	3	1,440	30	155	390	650	840	928	1,060	1,202
Education	< College	829	388.8	295.8	10.3	5	1,435	30	135	330	600	810	930	1,050	1,155
Education	College Graduate	473	325.9	272.7	12.5	2	1,140	30	90	240	499	735	860	990	1,035
Education	Post Graduate	307	282.5	257.1	14.7	3	1,205	20	60	200	430	665	810	900	983
Census Region	Northeast	932	369.5	287.7	9.4	2	1,440	30	120	314	565	800	892	990	1,095
Census Region	Midwest	938	384.1	304.8	10.0	2	1,440	29	120	320	600	825	930	1,080	1,140
Census Region	South	1,409	404.0	308.5	8.2	1	1,440	30	130	345	630	840	943	1,090	1,205
Census Region	West	726	349.9	292.0	10.8	1	1,440	30	110	274	541	800	900	1,045	1,180
Day Of Week	Weekday	2,661	374.7	296.2	5.7	1	1,440	30	120	315	578	810	915	1,045	1,150
Day Of Week	Weekend	1,344	394.9	308.5	8.4	1	1,440	30	120	322	625	833	940	1,110	1,260
Season	Winter	1,046	374.2	304.2	9.4	1	1,440	25	115	295	590	815	925	1,080	1,170
Season	Spring	1,034	384.8	301.6	9.4	2	1,440	30	120	320	610	810	900	1,105	1,215
Season	Summer	1,059	385.1	300.4	9.2	2	1,440	30	120	330	591	840	940	1,040	1,130
Season	Fall	866	382.0	295.1	10.0	2	1,440	30	120	324	590	810	915	1,030	1,150
Asthma	No	3,687	378.8	298.4	4.9	1	1,440	30	120	315	591	810	915	1,050	1,170
Asthma	Yes	298	416.9	324.0	18.8	5	1,440	20	135	343	652	870	1,015	1,202	1,335
Asthma	DK	20	350.0	304.3	68.0	25	995	28	60	290	540	795	902.5	995	995
Angina	No	3,892	380.9	299.5	4.8	1	1,440	30	120	320	595	815	920	1,060	1,170
Angina	Yes	87	404.3	345.1	37.0	2	1,380	30	120	270	703	910	1,015	1,320	1,380
Angina	DK	26	390.6	300.4	58.9	25	995	30	115	343	670	780	790	995	995
Bronchitis/Emphysema	No	3,749	378.7	298.6	4.9	1	1,440	30	120	315	590	810	915	1,060	1,170
Bronchitis/Emphysema	Yes	236	431.2	326.8	21.3	5	1,380	30	150	363	680	892	980	1,205	1,260
Bronchitis/Emphysema	DK	20	326.3	291.1	65.1	10	995	18	85	223	540	755	888	995	995

- = Indicates missing data.
DK = The respondent replied “don’t know”.
Refused = Refused data.
N = Doer sample size.
SD = Standard deviation.
SE = Standard error.
Min = Minimum number of minutes.
Max = Maximum number of minutes.

Source: U.S. EPA (1996).

Table 16-51. Number of Minutes Spent Smoking and Smoking Cigars or Pipe Tobacco (minutes/day)

			Smoking												
			Percentiles												
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		9,386	0	0	0	0	0	0	240	615	795	930	1,035	1,440
Gender	Male	4,294	0	0	0	0	0	0	310	685	840	983	1,095	1,440
Gender	Female	5,088	0	0	0	0	0	0	180	545	725	870	960	1,440
Age (years)	1 to 4	499	0	0	0	0	0	0	75	455	735	975	1,095	1,440
Age (years)	5 to 11	703	0	0	0	0	0	0	82	370	625	975	1,140	1,440
Age (years)	12 to 17	589	0	0	0	0	0	0	130	377	542	810	864	1,260
Age (years)	18 to 64	6,059	0	0	0	0	0	0	345	675	830	950	1,045	1,440
Age (years)	> 64	1,349	0	0	0	0	0	0	10	340	622	825	910	1,440
Race	White	7,591	0	0	0	0	0	0	250	630	805	940	1,035	1,440
Race	Black	945	0	0	0	0	0	0	225	540	715	910	1,071	1,440
Race	Asian	157	0	0	0	0	0	0	60	375	494	565	790	800
Race	Some Others	182	0	0	0	0	0	0	255	680	815	1,140	1,305	1,328
Race	Hispanic	385	0	0	0	0	0	0	175	481	652	813	845	1,095
Hispanic	No	8,534	0	0	0	0	0	0	243	625	800	940	1,035	1,440
Hispanic	Yes	702	0	0	0	0	0	0	175	518	680	850	920	1,440
Employment	Full Time	4,096	0	0	0	0	0	0	360	687	835	945	1,005	1,440
Employment	Part Time	802	0	0	0	0	0	0	295	630	793	930	1,054	1,440
Employment	Not Employed	2,644	0	0	0	0	0	0	145	555	768	915	1,045	1,440
Education	< High School	834	0	0	0	0	0	0	420	790	880	1,004	1,105	1,440
Education	High School Graduate	2,612	0	0	0	0	0	5	390	710	840	956	1,060	1,440
Education	< College	1,801	0	0	0	0	0	0	288	630	805	945	1,045	1,435
Education	College Graduate	1,247	0	0	0	0	0	0	135	480	660	860	970	1,140
Education	Post Graduate	924	0	0	0	0	0	0	60	380	595	795	860	1,205
Census Region	Northeast	2,075	0	0	0	0	0	0	259	610	775	915	990	1,440
Census Region	Midwest	2,102	0	0	0	0	0	0	255	630	810	945	1,054	1,440
Census Region	South	3,243	0	0	0	0	0	0	275	655	810	950	1,060	1,440
Census Region	West	1,966	0	0	0	0	0	0	140	510	710	885	990	1,440
Day of Week	Weekday	6,316	0	0	0	0	0	0	225	595	780	925	1,015	1,440
Day of Week	Weekend	3,070	0	0	0	0	0	0	260	651	810	950	1,080	1,440
Season	Winter	2,524	0	0	0	0	0	0	210	600	790	930	1,034	1,440
Season	Spring	2,438	0	0	0	0	0	0	240	626	785	920	1,060	1,440
Season	Summer	2,536	0	0	0	0	0	0	235	600	810	940	1,020	1,440
Season	Fall	1,888	0	0	0	0	0	0	285	630	791	945	1,020	1,440
Asthma	No	8,629	0	0	0	0	0	0	240	610	790	928	1,020	1,440
Asthma	Yes	694	0	0	0	0	0	0	270	668	855	1,020	1,170	1,440
Angina	No	9,061	0	0	0	0	0	0	240	615	795	930	1,034	1,440
Angina	Yes	250	0	0	0	0	0	0	125	615	835	1,008	1,125	1,380
Bronchitis/emphysema	No	8,882	0	0	0	0	0	0	235	605	785	928	1,020	1,440
Bronchitis/emphysema	Yes	433	0	0	0	0	0	50	405	810	900	1,040	1,205	1,380

Table 16-51. Number of Minutes Spent Smoking and Smoking Cigars or Pipe Tobacco (minutes/day) (continued)

		Smoking Cigars or Pipe Tobacco												
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		57	2	3	3	10	20	60	61	61	61	61	61	61
Gender	Male	53	3	5	10	10	20	60	61	61	61	61	61	61
Gender	Female	4	2	2	2	2	3	9	38	61	61	61	61	61
Age (years)	5 to 11	1	15	15	15	15	15	15	15	15	15	15	15	15
Age (years)	12 to 17	0	0	0	0	0	0	0	0	0	0	0	0	0
Age (years)	18 to 64	43	2	2	3	10	15	45	61	61	61	61	61	61
Age (years)	> 64	13	15	15	15	20	45	60	61	61	61	61	61	61
Race	White	50	2	3	3	10	20	60	61	61	61	61	61	61
Race	Black	4	10	10	10	10	10	15	25	30	30	30	30	30
Race	Some Others	0	0	0	0	0	0	0	0	0	0	0	0	0
Race	Hispanic	3	30	30	30	30	30	45	61	61	61	61	61	61
Hispanic	No	52	2	3	3	10	20	60	61	61	61	61	61	61
Hispanic	Yes	5	10	10	10	10	30	40	45	61	61	61	61	61
Employment	Full Time	37	2	2	3	10	20	60	61	61	61	61	61	61
Employment	Part Time	3	3	3	3	3	3	10	10	10	10	10	10	10
Employment	Not Employed	16	15	15	15	20	38	60	61	61	61	61	61	61
Education	< High School	2	45	45	45	45	45	53	61	61	61	61	61	61
Education	High School Graduate	22	2	2	10	10	15	45	61	61	61	61	61	61
Education	< College	16	3	3	3	3	25	60	61	61	61	61	61	61
Education	College Graduate	10	5	5	5	8	20	30	61	61	61	61	61	61
Education	Post Graduate	6	20	20	20	20	30	53	61	61	61	61	61	61
Census Region	Northeast	17	10	10	10	20	20	61	61	61	61	61	61	61
Census Region	Midwest	19	2	2	2	3	15	30	60	61	61	61	61	61
Census Region	South	11	10	10	10	10	10	45	61	61	61	61	61	61
Census Region	West	10	10	10	10	10	30	60	61	61	61	61	61	61
Day of Week	Weekday	37	2	2	3	10	20	60	61	61	61	61	61	61
Day of Week	Weekend	20	3	3	7	10	20	38	61	61	61	61	61	61
Season	Winter	16	3	3	3	10	15	25	60	61	61	61	61	61
Season	Spring	16	2	2	2	5	15	61	61	61	61	61	61	61
Season	Summer	18	10	10	10	20	30	60	61	61	61	61	61	61
Season	Fall	7	3	3	3	3	10	60	61	61	61	61	61	61
Asthma	No	54	2	3	10	10	20	60	61	61	61	61	61	61
Asthma	Yes	3	3	3	3	3	3	5	60	60	60	60	60	60
Angina	No	55	2	3	3	10	20	60	61	61	61	61	61	61
Angina	Yes	2	60	60	60	60	60	61	61	61	61	61	61	61
Bronchitis/emphysema	No	56	2	3	3	10	20	60	61	61	61	61	61	61
Bronchitis/emphysema	Yes	1	60	60	60	60	60	60	60	60	60	60	60	60

N = Doer sample size.
Note: Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-52. Number of Minutes Spent (at home) Working or Being Near Food While Fried, Grilled, or Barbequed (minutes/day)

Category	Population Group	*N*	Percentiles											
			1	2	5	10	25	50	75	90	95	98	99	100
All		1,055	0	1	2	5	10	20	30	105	121	121	121	121
Gender	Male	485	0	1	2	5	10	20	30	90	121	121	121	121
Gender	Female	570	0	0	2	5	10	20	30	120	121	121	121	121
Age (years)	1 to 4	35	0	0	2	2	5	20	30	45	60	60	60	60
Age (years)	5 to 11	82	0	0	0	2	5	15	30	60	90	121	121	121
Age (years)	12 to 17	82	0	0	2	4	10	20	45	60	90	121	121	121
Age (years)	18 to 64	747	0	2	3	5	10	20	40	120	121	121	121	121
Age (years)	> 64	96	0	1	3	5	10	20	30	60	120	121	121	121
Race	White	848	0	1	2	5	10	20	30	105	121	121	121	121
Race	Black	115	2	2	5	5	10	20	30	61	121	121	121	121
Race	Asian	18	0	0	0	0	5	10	20	121	121	121	121	121
Race	Some Others	16	5	5	5	5	13	20	45	121	121	121	121	121
Race	Hispanic	48	0	0	5	5	15	30	60	90	121	121	121	121
Hispanic	No	960	0	1	2	5	10	20	30	90	121	121	121	121
Hispanic	Yes	84	0	1	2	5	10	20	60	121	121	121	121	121
Employment	Full Time	506	1	2	3	5	10	20	45	121	121	121	121	121
Employment	Part Time	95	0	1	2	5	10	15	40	90	121	121	121	121
Employment	Not Employed	252	0	1	3	5	10	20	30	90	121	121	121	121
Education	< High School	96	0	1	2	5	10	23	53	121	121	121	121	121
Education	High School Graduate	318	0	2	5	5	10	20	30	120	121	121	121	121
Education	< College	208	0	2	3	5	10	20	35	121	121	121	121	121
Education	College Graduate	135	1	1	2	5	10	20	30	90	121	121	121	121
Education	Post Graduate	83	0	2	5	5	10	15	30	60	121	121	121	121
Census Region	Northeast	198	0	2	3	5	10	15	30	90	121	121	121	121
Census Region	Midwest	248	0	0	4	5	10	20	30	121	121	121	121	121
Census Region	South	399	0	1	2	5	10	20	40	90	121	121	121	121
Census Region	West	210	0	0	2	5	7	15	30	60	121	121	121	121
Day of Week	Weekday	662	0	1	3	5	10	20	30	90	121	121	121	121
Day of Week	Weekend	393	0	1	2	5	10	20	30	120	121	121	121	121
Season	Winter	267	0	2	2	5	10	20	30	60	121	121	121	121
Season	Spring	296	0	0	3	5	10	20	45	120	121	121	121	121
Season	Summer	299	0	0	3	5	10	20	30	90	121	121	121	121
Season	Fall	193	0	0	2	5	10	20	30	121	121	121	121	121
Asthma	No	960	0	1	3	5	10	20	30	90	121	121	121	121
Asthma	Yes	92	0	0	2	5	15	30	60	121	121	121	121	121
Angina	No	1,032	0	1	2	5	10	20	30	95	121	121	121	121
Angina	Yes	19	0	0	0	5	15	30	30	121	121	121	121	121
Bronchitis/Emphysema	No	1,005	0	1	2	5	10	20	30	90	121	121	121	121
Bronchitis/Emphysema	Yes	47	0	0	3	5	10	30	60	121	121	121	121	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-53. Number of Minutes Spent (at home) Working or Being Near Open Flames Including Barbeque Flames (minutes/day)

			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		479	0	0	1	2	10	20	60	121	121	121	121	121
Gender	Male	252	0	0	1	2	10	20	60	121	121	121	121	121
Gender	Female	227	0	0	2	2	10	20	30	121	121	121	121	121
Age (years)	1 to 4	14	0	0	0	0	5	10	30	121	121	121	121	121
Age (years)	5 to 11	29	0	0	0	0	5	15	30	90	121	121	121	121
Age (years)	12 to 17	28	0	0	1	2	10	23	43	60	60	90	90	90
Age (years)	18 to 64	372	0	0	1	3	10	20	60	121	121	121	121	121
Age (years)	> 64	31	2	2	2	4	5	17	30	120	121	121	121	121
Race	White	407	0	0	1	2	10	20	45	121	121	121	121	121
Race	Black	31	0	0	0	2	5	20	30	60	121	121	121	121
Race	Asian	5	5	5	5	5	20	40	121	121	121	121	121	121
Race	Some Others	8	10	10	10	10	11	23	60	121	121	121	121	121
Race	Hispanic	22	2	2	3	5	5	30	60	120	121	121	121	121
Hispanic	No	436	0	0	1	2	10	20	43	121	121	121	121	121
Hispanic	Yes	36	2	2	3	5	11	60	90	121	121	121	121	121
Employment	Full Time	262	0	0	1	2	10	20	60	121	121	121	121	121
Employment	Part Time	44	0	0	1	4	5	15	53	121	121	121	121	121
Employment	Not Employed	99	0	1	2	3	10	20	40	120	121	121	121	121
Education	< High School	27	2	2	2	3	5	20	60	121	121	121	121	121
Education	High School Graduate	130	0	0	2	3	10	20	60	121	121	121	121	121
Education	< College	92	0	0	1	2	10	30	90	121	121	121	121	121
Education	College Graduate	95	0	1	2	5	10	20	40	121	121	121	121	121
Education	Post Graduate	55	0	0	0	2	10	20	40	121	121	121	121	121
Census Region	Northeast	124	0	0	1	3	10	15	30	121	121	121	121	121
Census Region	Midwest	112	0	0	2	3	10	20	45	121	121	121	121	121
Census Region	South	149	0	0	1	2	5	20	60	121	121	121	121	121
Census Region	West	94	0	0	1	2	10	20	60	121	121	121	121	121
Day of Week	Weekday	284	0	0	1	3	10	15	30	121	121	121	121	121
Day of Week	Weekend	195	0	0	1	2	10	30	60	121	121	121	121	121
Season	Winter	142	0	0	0	2	10	20	60	121	121	121	121	121
Season	Spring	115	0	1	2	3	10	20	60	120	121	121	121	121
Season	Summer	137	0	0	2	3	10	20	45	121	121	121	121	121
Season	Fall	85	1	1	1	3	10	20	40	121	121	121	121	121
Asthma	No	443	0	0	1	2	10	20	45	121	121	121	121	121
Asthma	Yes	35	0	0	3	3	15	30	120	121	121	121	121	121
Angina	No	461	0	0	1	2	10	20	45	121	121	121	121	121
Angina	Yes	15	2	2	2	2	10	15	60	121	121	121	121	121
Bronchitis/Emphysema	No	461	0	0	1	2	10	20	45	121	121	121	121	121
Bronchitis/Emphysema	Yes	16	3	3	3	5	13	38	106	121	121	121	121	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-54. Number of Minutes Spent Running, Walking, or Standing Alongside a Road With Heavy Traffic (minutes/day)

Category	Population Group	*N*	Percentiles											
			1	2	5	10	25	50	75	90	95	98	99	100
All		401	0	1	2	2	5	15	30	60	121	121	121	121
Gender	Male	202	1	1	2	3	5	18	45	120	121	121	121	121
Gender	Female	198	0	0	1	2	5	10	30	60	120	121	121	121
Age (years)	1 to 4	12	1	1	1	2	4	8	30	60	60	60	60	60
Age (years)	5 to 11	20	1	1	2	2	5	6	13	25	60	90	90	90
Age (years)	12 to 17	27	0	0	2	2	4	5	30	60	90	120	120	120
Age (years)	18 to 64	304	0	1	1	2	5	15	30	90	121	121	121	121
Age (years)	> 64	31	2	2	2	4	5	20	45	60	121	121	121	121
Race	White	306	0	1	2	2	5	15	30	110	121	121	121	121
Race	Black	51	0	0	1	1	3	7	30	50	60	60	121	121
Race	Asian	10	3	3	3	4	5	8	15	18	20	20	20	20
Race	Some Others	7	2	2	2	2	5	10	45	121	121	121	121	121
Race	Hispanic	24	2	2	2	3	10	18	40	60	60	120	120	120
Hispanic	No	356	0	1	1	2	5	15	30	90	121	121	121	121
Hispanic	Yes	43	1	1	2	2	5	10	30	60	120	121	121	121
Employment	Full Time	214	0	1	1	2	5	15	30	120	121	121	121	121
Employment	Part Time	50	0	1	2	2	5	15	30	90	121	121	121	121
Employment	Not Employed	76	0	1	2	3	6	15	30	60	110	120	121	121
Education	< High School	18	4	4	4	5	6	10	15	30	121	121	121	121
Education	High School Graduate	106	1	1	2	2	5	15	60	121	121	121	121	121
Education	< College	84	0	0	1	3	6	20	40	120	121	121	121	121
Education	College Graduate	79	0	1	1	2	5	15	30	60	90	121	121	121
Education	Post Graduate	50	1	1	2	2	5	10	20	53	90	120	120	120
Census Region	Northeast	129	1	1	2	2	5	20	50	120	121	121	121	121
Census Region	Midwest	83	0	0	1	2	5	10	20	60	121	121	121	121
Census Region	South	105	0	0	1	2	5	15	30	90	121	121	121	121
Census Region	West	84	1	2	2	3	5	15	30	60	120	121	121	121
Day of Week	Weekday	303	0	0	2	2	5	15	30	60	120	121	121	121
Day of Week	Weekend	98	1	1	2	3	5	15	30	121	121	121	121	121
Season	Winter	104	0	0	1	2	5	10	20	60	110	121	121	121
Season	Spring	114	1	1	2	2	6	20	60	120	121	121	121	121
Season	Summer	104	0	1	2	2	5	10	30	60	121	121	121	121
Season	Fall	79	0	1	2	3	5	20	35	120	121	121	121	121
Asthma	No	370	0	1	2	2	5	15	30	60	121	121	121	121
Asthma	Yes	31	0	0	1	2	5	15	30	120	121	121	121	121
Angina	No	393	0	1	2	2	5	15	30	90	121	121	121	121
Angina	Yes	8	2	2	2	2	7	18	30	60	60	60	60	60
Bronchitis/Emphysema	No	378	0	1	1	2	5	15	30	60	121	121	121	121
Bronchitis/Emphysema	Yes	22	2	2	5	5	5	18	30	121	121	121	121	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-55. Number of Minutes Spent in a Car, Van, Truck, or Bus in Heavy Traffic (minutes/day)

Category	Population Group	*N*	Percentiles											
			1	2	5	10	25	50	75	90	95	98	99	100
All		1,197	1	2	5	5	10	20	60	120	121	121	121	121
Gender	Male	534	1	2	4	5	10	20	60	120	121	121	121	121
Gender	Female	663	1	2	5	5	10	25	60	120	121	121	121	121
Age (years)	1 to 4	33	4	4	5	5	10	15	30	60	60	121	121	121
Age (years)	5 to 11	63	1	2	5	5	10	20	45	60	120	121	121	121
Age (years)	12 to 17	52	3	3	4	5	9	13	28	90	120	120	121	121
Age (years)	18 to 64	889	1	2	5	5	10	25	60	120	121	121	121	121
Age (years)	> 64	139	3	3	5	5	15	30	60	121	121	121	121	121
Race	White	959	1	2	4	5	10	25	60	120	121	121	121	121
Race	Black	133	2	3	5	5	10	20	40	90	120	121	121	121
Race	Asian	20	5	5	5	5	11	20	30	45	53	60	60	60
Race	Some Others	24	5	5	10	10	13	30	60	90	120	121	121	121
Race	Hispanic	55	1	2	5	5	10	20	60	120	121	121	121	121
Hispanic	No	1,097	1	2	5	5	10	20	60	120	121	121	121	121
Hispanic	Yes	95	1	2	5	5	10	20	90	121	121	121	121	121
Employment	Full Time	659	1	2	5	5	10	30	60	120	121	121	121	121
Employment	Part Time	108	2	2	4	5	10	20	49	121	121	121	121	121
Employment	Not Employed	279	1	2	5	5	10	30	60	120	121	121	121	121
Education	< High School	81	0	3	5	10	10	20	40	121	121	121	121	121
Education	High School Graduate	352	1	2	5	5	10	30	60	120	121	121	121	121
Education	< College	276	1	2	3	5	15	30	60	120	121	121	121	121
Education	College Graduate	176	1	2	4	5	13	30	60	120	121	121	121	121
Education	Post Graduate	150	2	2	5	5	10	20	60	98	120	121	121	121
Census Region	Northeast	229	2	2	4	5	10	20	60	120	121	121	121	121
Census Region	Midwest	263	2	2	5	5	10	30	45	120	121	121	121	121
Census Region	South	429	1	2	5	5	10	30	60	120	121	121	121	121
Census Region	West	276	1	2	5	5	10	20	60	120	121	121	121	121
Day of Week	Weekday	927	1	2	5	5	10	20	60	120	121	121	121	121
Day of Week	Weekend	270	2	2	5	5	10	25	60	120	121	121	121	121
Season	Winter	286	1	2	5	5	10	20	60	120	121	121	121	121
Season	Spring	317	1	2	5	5	10	30	60	120	121	121	121	121
Season	Summer	312	1	3	5	5	10	30	60	120	121	121	121	121
Season	Fall	282	2	2	4	5	10	20	45	120	121	121	121	121
Asthma	No	1,108	1	2	5	5	10	20	60	120	121	121	121	121
Asthma	Yes	89	2	2	5	5	10	30	60	121	121	121	121	121
Angina	No	1,159	1	2	5	5	10	20	60	120	121	121	121	121
Angina	Yes	35	0	0	5	5	10	30	70	121	121	121	121	121
Bronchitis/emphysema	No	1,130	2	2	5	5	10	20	60	120	121	121	121	121
Bronchitis/emphysema	Yes	64	1	1	2	5	10	28	51	120	121	121	121	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-56. Number of Minutes Spent in a Parking Garage or Indoor Parking Lot (minutes/day)

Category	Population Group		Percentiles											
		N	1	2	5	10	25	50	75	90	95	98	99	100
All		294	0	1	1	2	3	5	10	30	60	121	121	121
Gender	Male	138	1	1	1	2	4	5	15	60	121	121	121	121
Gender	Female	156	0	1	1	2	3	5	10	20	40	60	120	121
Age (years)	1 to 4	8	0	0	0	0	2	4	5	10	10	10	10	10
Age (years)	5 to 11	15	1	1	1	2	3	5	10	45	60	60	60	60
Age (years)	12 to 17	20	0	0	1	2	2	8	15	45	91	121	121	121
Age (years)	18 to 64	229	1	1	2	2	5	5	10	30	60	121	121	121
Age (years)	> 64	18	0	0	0	2	3	5	15	45	90	90	90	90
Race	White	208	1	1	2	2	3	5	10	30	60	121	121	121
Race	Black	34	0	0	1	1	5	5	15	20	30	30	30	30
Race	Asian	15	2	2	2	2	2	10	60	120	121	121	121	121
Race	Some Others	7	3	3	3	3	3	5	15	121	121	121	121	121
Race	Hispanic	28	1	1	1	2	5	10	20	60	120	121	121	121
Hispanic	No	251	0	1	1	2	3	5	10	30	60	120	121	121
Hispanic	Yes	39	1	1	1	3	5	10	30	121	121	121	121	121
Employment	Full Time	171	1	1	1	2	3	5	10	30	60	121	121	121
Employment	Part Time	23	2	2	5	5	5	5	10	30	60	121	121	121
Employment	Not Employed	58	0	1	1	2	4	10	20	40	120	121	121	121
Education	< High School	13	0	0	0	5	5	10	10	30	121	121	121	121
Education	High School Graduate	58	1	1	1	2	3	10	30	90	121	121	121	121
Education	< College	54	1	1	2	2	4	5	15	40	120	120	121	121
Education	College Graduate	72	1	1	2	2	5	5	10	15	60	120	121	121
Education	Post Graduate	50	1	1	2	2	5	5	10	13	20	40	60	60
Census Region	Northeast	53	2	2	2	2	5	6	10	30	90	121	121	121
Census Region	Midwest	59	0	0	1	2	3	5	10	30	60	121	121	121
Census Region	South	92	1	1	2	2	4	5	10	30	60	121	121	121
Census Region	West	90	0	1	1	2	4	5	15	45	60	121	121	121
Day of Week	Weekday	208	0	1	1	2	3	5	10	30	60	121	121	121
Day of Week	Weekend	86	1	1	2	2	5	7	15	30	60	121	121	121
Season	Winter	67	0	1	1	2	3	5	10	20	30	120	121	121
Season	Spring	78	0	1	1	2	3	6	15	60	120	121	121	121
Season	Summer	85	0	1	2	2	5	5	15	30	90	121	121	121
Season	Fall	64	1	1	2	2	5	5	10	30	45	121	121	121
Asthma	No	263	1	1	2	2	3	5	10	30	60	121	121	121
Asthma	Yes	30	0	0	1	1	4	7	10	30	121	121	121	121
Angina	No	291	0	1	1	2	4	5	10	30	60	121	121	121
Angina	Yes	2	3	3	3	3	3	47	90	90	90	90	90	90
Bronchitis/emphysema	No	281	0	1	1	2	3	5	10	30	60	121	121	121
Bronchitis/emphysema	Yes	12	2	2	2	5	5	6	10	60	120	120	120	120

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-57. Number of Minutes Spent Walking Outside to a Car in the Driveway or Outside Parking Areas (minutes/day)

Category	Population Group	*N*	Percentiles											
			1	2	5	10	25	50	75	90	95	98	99	100
All		3,303	0	0	0	0	2	5	10	20	30	60	121	121
Gender	Male	1,511	0	0	0	0	2	4	10	20	30	60	121	121
Gender	Female	1,791	0	0	0	0	2	5	10	20	30	60	60	121
Age (years)	1 to 4	132	0	0	0	0	2	2	5	15	20	30	60	121
Age (years)	5 to 11	245	0	0	0	0	1	2	5	15	30	45	80	121
Age (years)	12 to 17	202	0	0	0	0	1	5	10	20	30	30	60	121
Age (years)	18 to 64	2,303	0	0	0	0	2	5	10	20	30	60	120	121
Age (years)	> 64	373	0	0	0	1	2	5	10	15	30	30	88	121
Race	White	2,756	0	0	0	0	2	5	10	20	30	60	120	121
Race	Black	279	0	0	0	0	1	3	5	10	20	30	45	88
Race	Asian	53	0	0	0	0	1	3	10	15	30	32	45	45
Race	Some Others	63	0	0	0	0	2	5	10	30	30	60	120	120
Race	Hispanic	127	0	0	1	1	2	5	10	20	60	120	121	121
Hispanic	No	3,029	0	0	0	0	2	5	10	20	30	60	120	121
Hispanic	Yes	235	0	0	0	0	2	5	10	20	60	120	121	121
Employment	Full Time	1,613	0	0	0	0	2	5	10	20	30	60	120	121
Employment	Part Time	312	0	0	0	1	2	5	10	20	45	120	121	121
Employment	Not Employed	785	0	0	0	0	2	5	10	20	30	60	60	121
Education	< High School	241	0	0	0	0	2	4	10	20	30	110	121	121
Education	High School Graduate	935	0	0	0	0	2	5	10	20	30	60	121	121
Education	< College	680	0	0	0	1	2	5	10	20	30	60	120	121
Education	College Graduate	445	0	0	0	0	2	5	10	20	30	60	60	121
Education	Post Graduate	381	0	0	0	1	2	5	10	15	25	30	120	121
Census Region	Northeast	680	0	0	0	0	2	5	10	15	30	60	90	121
Census Region	Midwest	763	0	0	0	1	2	5	10	15	30	60	120	121
Census Region	South	1,149	0	0	0	0	2	4	10	20	30	60	90	121
Census Region	West	711	0	0	0	0	2	5	10	20	30	60	120	121
Day of Week	Weekday	2,209	0	0	0	0	2	5	10	20	30	60	120	121
Day of Week	Weekend	1,094	0	0	0	0	2	5	10	20	30	60	120	121
Season	Winter	855	0	0	0	0	1	4	10	15	30	30	100	121
Season	Spring	890	0	0	0	0	2	5	10	20	30	100	120	121
Season	Summer	903	0	0	0	0	2	4	10	20	30	60	60	121
Season	Fall	655	0	0	0	1	2	5	10	15	30	45	110	121
Asthma	No	3,063	0	0	0	0	2	5	10	20	30	60	120	121
Asthma	Yes	234	0	0	0	1	2	5	10	15	30	120	121	121
Angina	No	3,219	0	0	0	0	2	5	10	20	30	60	120	121
Angina	Yes	72	0	0	0	0	2	5	10	15	30	45	110	110
Bronchitis/Emphysema	No	3,132	0	0	0	0	2	5	10	20	30	60	120	121
Bronchitis/Emphysema	Yes	162	0	0	0	0	2	5	10	20	30	110	121	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-58. Number of Minutes Spent Running or Walking Outside Other Than to the Car (minutes/day)

Category	Population Group	*N*	Percentiles											
			1	2	5	10	25	50	75	90	95	98	99	100
All		1,273	1	1	3	5	15	45	120	121	121	121	121	121
Gender	Male	605	2	2	5	10	20	60	121	121	121	121	121	121
Gender	Female	668	0	1	2	5	15	30	116	121	121	121	121	121
Age (years)	1 to 4	82	3	3	5	10	30	120	121	121	121	121	121	21
Age (years)	5 to 11	149	4	5	5	10	30	120	121	121	121	121	121	21
Age (years)	12 to 17	110	5	5	5	10	15	60	121	121	121	121	121	121
Age (years)	18 to 64	772	0	1	2	5	15	30	120	121	121	121	121	121
Age (years)	> 64	143	1	1	2	5	15	30	60	121	121	121	121	121
Race	White	1,051	1	1	3	5	15	45	121	121	121	121	121	121
Race	Black	111	0	1	3	5	15	35	120	121	121	121	121	121
Race	Asian	21	2	2	10	10	15	30	70	120	121	121	121	121
Race	Some Others	23	5	5	10	15	20	60	121	121	121	121	121	121
Race	5:hispanic	55	2	3	8	10	20	40	90	121	121	121	121	121
Hispanic	No	1,156	1	1	3	5	15	45	120	121	121	121	121	121
Hispanic	Yes	99	1	2	2	10	20	60	121	121	121	121	121	121
Employment	Full Time	517	0	1	2	5	15	30	120	121	121	121	121	121
Employment	Part Time	112	1	2	2	5	15	30	90	121	121	121	121	121
Employment	Not Employed	300	1	1	3	5	15	30	120	121	121	121	121	121
Education	< High School	97	0	1	3	5	15	30	90	121	121	121	121	121
Education	High School Graduate	287	0	0	2	5	15	30	120	121	121	121	121	121
Education	< College	234	1	1	2	5	15	30	120	121	121	121	121	121
Education	College Graduate	153	1	2	5	10	20	45	120	121	121	121	121	121
Education	Post Graduate	138	1	1	3	5	15	38	90	121	121	121	121	121
Census Region	Northeast	265	1	1	3	5	20	45	120	121	121	121	121	121
Census Region	Midwest	286	1	2	5	5	15	40	121	121	121	121	121	121
Census Region	South	412	1	1	3	5	15	45	121	121	121	121	121	121
Census Region	West	310	1	1	3	6	15	45	120	121	121	121	121	121
Day of Week	Weekday	843	1	1	3	5	15	40	120	121	121	121	121	121
Day of Week	Weekend	430	1	2	4	5	20	60	121	121	121	121	121	21
Season	Winter	312	0	2	2	5	10	43	90	121	121	121	121	21
Season	Spring	403	1	2	4	10	20	60	121	121	121	121	121	121
Season	Summer	396	1	1	3	10	20	55	121	121	121	121	121	21
Season	Fall	162	1	1	2	5	15	30	120	121	121	121	121	121
Asthma	No	1,162	1	1	3	5	15	45	120	121	121	121	121	21
Asthma	Yes	105	2	4	5	6	15	45	121	121	121	121	121	21
Angina	No	1,240	1	1	3	5	15	45	120	121	121	121	121	121
Angina	Yes	25	1	1	5	5	15	45	121	121	121	121	121	121
Bronchitis/Emphysema	No	1,204	1	1	3	5	15	45	120	121	121	121	121	121
Bronchitis/Emphysema	Yes	62	1	2	4	5	15	30	120	121	121	121	121	121

N = Doer sample size.

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-59. Number of Times Washing Dishes by Hand at Specified Frequencies by the Number of Respondents

	N	Number of Times/Week					
		-	Almost Every Day	3-5/Week	1-2/Week	<1-2/Week	DK
All	3,626	1	2,600	490	326	197	12
Gender							
Male	1,554	-	982	264	183	117	8
Female	2,071	1	1,618	225	143	80	4
Refused	1	-	-	1	-	-	-
Age (years)							
-	65	-	51	6	2	6	-
1 to 4	1	-	-	-	1	-	-
5 to 11	103	-	12	14	33	44	-
12 to 17	228	-	57	45	69	56	1
18 to 64	2,642	1	1,979	379	201	76	6
> 64	587	-	501	46	20	15	5
Race							
White	2,928	1	2,114	391	257	157	8
Black	385	-	261	61	40	21	2
Asian	61	-	48	6	3	4	-
Some Others	67	-	44	9	9	5	-
Hispanic	147	-	108	17	12	8	2
Refused	38	-	25	6	5	2	-
Hispanic							
No	3,322	1	2,383	454	296	178	10
Yes	258	-	185	32	25	14	2
DK	21	-	16	-	3	2	-
Refused	25	-	16	4	2	3	-
Employment							
-	328	-	71	57	102	97	1
Full Time	1,765	-	1,282	284	145	50	4
Part Time	349	-	270	44	17	15	3
Not Employed	1,165	1	965	104	60	31	4
Refused	19	-	12	1	2	4	-
Education							
-	386	-	101	65	107	112	1
< High School	354	-	298	26	15	12	3
High School Graduate	1,106	1	856	140	74	30	5
< College	796	-	606	116	57	16	1
College Graduate	591	-	445	86	47	13	-
Post Graduate	393	-	294	57	26	14	2
Census Region							
Northeast	832	-	636	90	60	43	3
Midwest	811	-	569	114	81	45	2
South	1,214	1	840	175	124	70	4
West	769	-	555	111	61	39	3
Day of Week							
Weekday	2,474	-	1,759	335	236	136	8
Weekend	1,152	1	841	155	90	61	4
Season							
Winter	985	-	691	138	90	63	3
Spring	902	1	648	117	85	46	5
Summer	987	-	705	132	92	55	3
Fall	752	-	556	103	59	33	1
Asthma							
No	3,345	1	2,407	455	290	183	9
Yes	263	-	179	33	34	14	3
DK	18	-	14	2	2	-	-
Angina							
No	3,501	-	2,499	475	321	194	12
Yes	105	1	86	11	5	2	-
DK	20	-	15	4	-	1	-
Bronchitis/Emphysema							
No	3438	1	2,459	460	314	192	12
Yes	1,69	-	126	27	11	5	-
DK	19	-	15	3	1	-	-

Table 16-59. Number of Times Washing Dishes by Hand at Specified Frequencies by the Number of Respondents (continued)

-	= Indicates missing data.
DK	= The respondent replied “don't know”.
Refused	= Refused data.
N	= Sample size.

Source: U.S. EPA (1996).

Table 16-60. Number of Times Using a Dishwasher at Specified Frequencies by the Number of Respondents

	Total *N*	Number of Times/Week					
		-	Almost Every Day	3-5/Week	1-2/Week	<1-2/Week	DK
All	2,635	1	557	678	529	824	46
Gender							
Male	1,235	-	259	282	247	417	30
Female	1,399	1	298	396	282	406	16
Refused	1	-	-	-	-	1	-
Age (years)							
-	35	-	4	13	11	6	1
1 to 4	145	-	9	4	3	118	11
5 to 11	211	-	14	8	15	157	17
12 to 17	206	-	27	33	31	113	2
18 to 64	1,718	-	438	512	397	360	11
> 64	320	1	65	108	72	70	4
Race							
White	2,267	1	504	603	487	637	35
Black	163	-	19	32	19	90	3
Asian	54	-	7	8	7	31	1
Some Others	45	-	9	8	1	24	3
Hispanic	84	-	13	15	12	40	4
Refused	22	-	5	12	3	2	-
Hispanic							
No	2,444	1	524	635	504	739	41
Yes	164	-	27	32	21	79	5
DK	11	-	2	2	2	5	-
Refused	16	-	4	9	2	1	-
Employment							
-	552	-	49	45	46	382	30
Full Time	1,191	-	276	359	298	249	9
Part Time	204	-	48	70	46	38	2
Not Employed	678	1	181	200	136	155	5
Refused	10	-	3	4	3	-	-
Education							
-	593	-	55	51	55	400	32
< High School	124	1	29	27	26	41	-
High School Graduate	582	-	153	173	114	132	10
< College	560	-	144	181	117	117	1
College Graduate	446	-	105	134	126	80	1
Post Graduate	330	-	71	112	91	54	2
Census Region							
Northeast	538	-	133	144	95	159	7
Midwest	514	-	116	130	110	152	6
South	953	-	200	251	169	312	21
West	630	1	108	153	155	201	12
Day of Week							
Weekday	1,768	1	378	466	341	549	33
Weekend	867	-	179	212	188	275	13
Season							
Winter	711	-	144	175	149	223	20
Spring	664	1	122	181	132	214	14
Summer	721	-	157	185	134	239	6
Fall	539	-	134	137	114	148	6
Asthma							
No	2,439	1	521	622	492	765	38
Yes	189	-	35	54	35	58	7
DK	7	-	1	2	2	1	1
Angina							
No	2,570	1	538	664	512	809	46
Yes	60	-	19	11	16	14	-
DK	5	-	-	3	1	1	-
Bronchitis/Emphysema							
No	2,533	1	540	646	504	796	46
Yes	93	-	16	27	23	27	-
DK	9	-	1	5	2	1	-

- = Indicates missing data.
DK = The respondent replied “don't know”.
Refused = Refused data.
N = Sample size.

Source: U.S. EPA (1996).

Table 16-61. Number of Times for Washing Clothes in a Washing Machine at Specified Frequencies by the Number of Respondents

		Number of Times/Week						
	Total *N*	-	Almost Every Day	3-5 /Day	1-2/week	<1/week	Never	DK
All	4,663	404	566	1,033	1,827	331	465	37
Gender								
Male	2,163	212	211	458	811	154	300	17
Female	2,498	191	355	575	1,015	177	165	20
Refused	2	1	-	-	1	-	-	-
Age (years)								
-	84	3	6	11	47	3	2	12
1 to 4	263	261	-	-	-	-	1	1
5 to 11	348	101	2	4	16	15	206	4
12 to 17	326	1	22	29	83	67	124	-
18 to 64	2,972	31	489	832	1,328	197	83	12
> 64	670	7	47	157	353	49	49	8
Race								
White	3,774	316	499	883	1,445	246	370	15
Black	463	39	33	72	207	52	55	5
Asian	77	4	1	12	39	13	8	-
Some Others	96	16	10	15	36	8	11	-
Hispanic	193	29	19	41	77	10	17	-
Refused	60	-	4	10	23	2	4	17
Hispanic								
No	4,244	342	528	950	1,674	307	424	19
Yes	347	59	31	69	130	20	38	-
DK	26	2	3	6	10	3	2	-
Refused	46	1	4	8	13	1	1	18
Employment								
-	926	366	23	32	97	76	327	5
Full Time	2,017	21	305	569	929	119	66	8
Part Time	379	6	64	101	166	29	13	-
Not Employed	1,309	10	170	326	628	105	58	12
Refused	32	1	4	5	7	2	1	12
Education								
-	1,021	367	33	37	129	89	343	23
< High School	399	3	61	88	178	40	27	2
High School Graduate	1,253	14	218	367	548	55	47	4
< College	895	3	126	261	432	51	19	3
College Graduate	650	12	78	171	321	57	9	2
Post Graduate	445	5	50	109	219	39	20	3
Census Region								
Northeast	1,048	84	119	216	454	81	87	7
Midwest	1,036	88	108	229	408	78	121	4
South	1,601	147	229	376	557	97	182	13
West	978	85	110	212	408	75	75	13
Day of Week								
Weekday	3,156	257	407	697	1,217	232	320	26
Weekend	1,507	147	159	336	610	99	145	11
Season								
Winter	1,264	121	157	273	472	101	129	11
Spring	1,181	122	135	259	464	82	113	6
Summer	1,275	102	163	280	484	88	142	16
Fall	943	59	111	221	407	60	81	4
Asthma								
No	4,287	371	522	951	1,700	303	421	19
Yes	341	32	42	79	118	26	43	1
DK	35	1	2	3	9	2	1	17
Angina								
No	4,500	403	555	993	1,759	321	451	18
Yes	125	-	8	37	58	7	13	2
DK	38	1	3	3	10	3	1	17

Table 16-61. Number of Times for Washing Clothes in a Washing Machine at Specified Frequencies by the Number of Respondents (continued)

		Number of Times/Week						
	Total *N*	-	Almost Every Day	3-5 /Day	1-2/week	<1/week	Never	DK
Bronchitis/emphysema								
No	4,424	397	549	979	1,724	315	441	19
Yes	203	7	15	51	92	14	23	1
DK	36	-	2	3	11	2	1	17

- = Indicates missing data.
DK = The respondent replied “don't know”.
Refused = Refused data.
N = Sample size.

Source: U.S. EPA (1996).

Table 16-62. Number of Loads of Laundry Washed in a Washing Machine at Home by the Number of Respondents

	N	Number of Loads/Day											
		1	2	3	4	5	6	7	8	9	10	>10	DK
All	1,762	582	604	303	123	55	27	11	12	1	5	1	38
Gender													
Male	678	219	241	120	41	17	8	-	-	1	1	-	30
Female	1,083	363	363	183	82	38	19	10	12	-	4	1	8
Refused	1	-	-	-	-	-	-	1	-	-	-	-	-
Age (years)													
-	30	9	14	2	3	1	-	-	-	-	-	-	1
1 to 4	109	29	36	24	12	5	2	-	-	-	1	-	-
5 to 11	141	38	55	28	8	6	2	1	-	1	1	-	1
12 to 17	127	39	52	22	10	1	1	-	1	-	-	-	1
18 to 64	1,161	385	376	209	80	35	22	9	11	-	3	1	30
> 64	194	82	71	18	10	7	-	1	-	-	-	-	5
Race													
White	1,511	513	519	254	101	48	23	11	12	1	3	-	26
Black	112	27	41	23	11	4	1	-	-	-	1	-	4
Asian	22	7	4	3	5	-	-	-	-	-	-	-	3
Some Others	31	8	12	5	1	1	1	-	-	-	-	-	3
Hispanic	68	18	24	15	5	2	2	-	-	-	1	-	1
Refused	18	9	4	3	-	-	-	-	-	-	-	1	1
Hispanic													
No	1,615	536	556	271	115	50	24	11	12	1	4	-	35
Yes	126	38	42	26	8	5	3	-	-	-	1	-	3
DK	6	-	2	4	-	-	-	-	-	-	-	-	-
Refused	15	8	4	2	-	-	-	-	-	-	-	1	-
Employment													
-	369	102	143	71	29	12	5	1	1	1	2	-	2
Full Time	734	259	244	128	42	20	10	5	4	-	2	-	20
Part Time	160	58	53	23	10	8	3	-	1	-	-	-	4
Not Employed	482	158	158	79	41	15	8	5	6	-	1	1	10
Refused	17	5	6	2	1	-	1	-	-	-	-	-	2
Education													
-	413	118	160	77	32	12	6	1	1	1	2	-	3
< High School	133	44	44	22	10	4	3	2	-	-	-	-	4
High School Graduate	508	175	166	85	35	18	8	3	4	-	-	-	14
< College	321	105	101	61	25	9	3	2	5	-	2	1	7
College Graduate	212	83	68	32	11	8	4	-	1	-	-	-	5
Post Graduate	175	57	65	26	10	4	3	3	1	-	1	-	5
Census Region													
Northeast	367	111	146	57	23	13	7	2	1	-	-	-	7
Midwest	406	125	123	76	42	14	5	3	6	1	-	1	10
South	628	205	228	110	39	17	6	6	4	-	3	-	10
West	361	141	107	60	19	11	9	-	1	-	2	-	11
Day of Week													
Weekday	1,172	418	409	194	62	29	17	7	7	1	1	1	26
Weekend	590	164	195	109	61	26	10	4	5	-	4	-	12
Season													
Winter	458	154	159	73	31	14	6	3	4	1	3	1	9
Spring	465	154	159	87	28	10	10	3	2	-	1	-	11
Summer	482	158	166	85	38	11	8	4	3	-	1	-	8
Fall	357	116	120	58	26	20	3	1	3	-	-	-	10
Asthma													
No	1615	548	545	274	105	50	27	11	12	1	5	1	36
Yes	140	31	56	28	18	5	-	-	-	-	-	-	2
DK	7	3	3	1	-	-	-	-	-	-	-	-	-
Angina													
No	1,710	564	592	294	113	54	26	11	12	1	5	1	37
Yes	40	14	9	7	8	1	1	-	-	-	-	-	-
DK	12	4	3	2	2	-	-	-	-	-	-	-	1
Bronchitis/Emphysema													
No	1,658	544	572	285	112	53	26	10	12	1	5	1	37
Yes	96	36	28	16	11	2	1	1	-	-	-	-	1
DK	8	2	4	2	-	-	-	-	-	-	-	-	-

Table 16-62. Number of Loads of Laundry Washed in a Washing Machine at Home by the Number of Respondents (continued)

-	= Indicates missing data.
DK	= The respondent replied “don't know”.
Refused	= Refused data.
N	= Sample size.

Source: U.S. EPA (1996).

Table 16-63. Range of the Number of Times an Automobile or Motor Vehicle Was Started in a Garage or Carport at Specified Daily Frequencies by the Number of Respondents

		Times/day				
	N	1-2	3-5	6-9	10+	DK
All	2,009	1321	559	78	17	34
Gender						
Male	939	588	290	40	7	14
Female	1,070	733	269	38	10	20
Age(years)						
-	20	13	2	1	1	3
1 to 4	111	68	39	2	2	-
5 to 11	150	93	49	6	-	2
12 to 17	145	86	42	12	1	4
18 to 64	1,287	840	367	50	12	18
> 64	296	221	60	7	1	7
Race						
White	1,763	1,164	486	69	17	27
Black	110	70	31	4	-	5
Asian	46	34	10	2	-	-
Some Others	24	19	5	-	-	-
Hispanic	55	26	24	3	-	2
Refused	11	8	3	-	-	-
Hispanic						
No	1,879	1,239	519	74	17	30
Yes	111	68	35	4	-	4
DK	12	9	3	-	-	-
Refused	7	5	2	-	-	-
Employment						
-	398	241	127	20	3	7
Full Time	919	610	253	35	9	12
Part Time	149	93	48	4	2	2
Not Employed	536	372	129	19	3	13
Refused	7	5	2	-	-	-
Education						
-	427	262	134	21	4	6
< High School	84	59	17	2	1	5
High School Graduate	464	336	107	13	2	6
< College	440	304	107	20	5	4
College Graduate	326	201	106	10	2	7
Post Graduate	268	159	88	12	3	6
Census Region						
Northeast	289	213	64	8	2	2
Midwest	541	360	142	29	2	8
South	702	430	221	27	8	16
West	477	318	132	14	5	8
Day of Week						
Weekday	1,383	903	386	63	11	20
Weekend	626	418	173	15	6	14
Season						
Winter	567	396	136	20	5	10
Spring	518	336	141	25	5	11
Summer	525	313	178	18	6	10
Fall	399	276	104	15	1	3
Asthma						
No	1,861	1,228	514	70	17	32
Yes	146	92	44	8	-	2
DK	2	1	1	-	-	-
Angina						
No	1,959	1,288	545	76	17	33
Yes	48	33	12	2	-	1
DK	2	-	2	-	-	-
Bronchitis/Emphysema						
No	1,922	1,266	532	74	17	33
Yes	84	54	25	4	-	1
DK	3	1	2	-	-	-

- = Indicates missing data.
DK = Respondent replied “don't know”.
Refused = Refused data.
N = Doer sample size.

Source: U.S. EPA (1996).

Table 16-64. Time Spent at Home While the Windows or Outside Door Were Left Open (minutes/day)

Windows Left Open														
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		1,960	2	10	30	180	360	840	961	961	961	961	961	961
Gender	Male	893	5	10	30	180	360	840	961	961	961	961	961	961
Gender	Female	1,067	2	10	30	119	360	840	961	961	961	961	961	961
Age (years)	1 to 4	99	0	1	10	180	180	600	961	961	961	961	961	961
Age (years)	5 to 11	159	3	10	20	60	360	600	961	961	961	961	961	961
Age (years)	12 to 17	101	2	5	24	180	360	600	961	961	961	961	961	961
Age (years)	18 to 64	1,282	6	16	60	180	360	840	961	961	961	961	961	961
Age (years)	> 64	282	1	5	30	180	360	840	961	961	961	961	961	961
Race	White	1,558	2	10	30	180	360	840	961	961	961	961	961	961
Race	Black	208	3	10	30	180	360	840	961	961	961	961	961	961
Race	Asian	47	10	10	16	180	360	600	961	961	961	961	961	961
Race	Some Others	44	1	1	60	90	180	600	961	961	961	961	961	961
Race	Hispanic	80	2	20	30	60	360	600	961	961	961	961	961	961
Hispanic	No	1,775	2	10	30	180	360	840	961	961	961	961	961	961
Hispanic	Yes	156	20	20	30	180	180	840	961	961	961	961	961	961
Employment	Full Time	822	5	15	30	180	360	840	961	961	961	961	961	961
Employment	Part Time	190	1	7	30	60	180	840	961	961	961	961	961	961
Employment	Not Employed	576	5	10	60	180	360	840	961	961	961	961	961	961
Education	< High School	163	1	6	30	90	360	840	961	961	961	961	961	961
Education	High School Graduate	542	2	10	60	180	360	840	961	961	961	961	961	961
Education	< College	408	5	15	30	119	360	840	961	961	961	961	961	961
Education	College Graduate	247	15	15	60	100	360	840	961	961	961	961	961	961
Education	Post Graduate	216	10	10	30	180	360	840	961	961	961	961	961	961
Census Region	Northeast	498	3	10	30	119	360	840	961	961	961	961	961	961
Census Region	Midwest	390	5	10	60	180	360	840	961	961	961	961	961	961
Census Region	South	494	1	6	30	90	360	600	961	961	961	961	961	961
Census Region	West	578	2	10	30	180	360	840	961	961	961	961	961	961
Day of Week	Weekday	1,285	3	10	30	180	360	840	961	961	961	961	961	961
Day of Week	Weekend	675	2	10	30	119	360	840	961	961	961	961	961	961
Season	Winter	308	1	2	10	24	180	360	961	961	961	961	961	961
Season	Spring	661	10	20	60	180	360	600	961	961	961	961	961	961
Season	Summer	680	10	30	180	180	600	961	961	961	961	961	961	961
Season	Fall	311	3	5	30	60	180	600	961	961	961	961	961	961
Asthma	No	1,809	2	10	30	180	360	840	961	961	961	961	961	961
Asthma	Yes	145	5	10	60	118	360	840	961	961	961	961	961	961
Angina	No	1,902	3	10	30	180	360	840	961	961	961	961	961	961
Angina	Yes	49	1	1	24	30	180	961	961	961	961	961	961	961
Bronchitis/Emphysema	No	1,850	2	10	30	180	360	840	961	961	961	961	961	961
Bronchitis/Emphysema	Yes	100	5	15	35	180	480	961	961	961	961	961	961	961

Table 16-64. Time Spent at Home While the Windows or Outside Door Were Left Open (minutes/day) (continued)

			Outside Door Left Open											
			Percentiles											
Category	Population Group	*N*	1	2	5	10	25	50	75	90	95	98	99	100
All		1,170	0	1	5	10	60	180	600	600	721	721	721	721
Gender	Male	505	0	1	3	10	60	180	600	600	721	721	721	721
Gender	Female	665	1	1	5	10	60	180	600	600	721	721	721	721
Age (years)	1 to 4	68	0	0	2	10	30	180	360	721	721	721	721	721
Age (years)	5 to 11	109	0	1	3	10	60	180	600	600	600	721	721	721
Age (years)	12 to 17	79	0	1	3	5	60	180	360	600	721	721	721	721
Age (years)	18 to 64	718	1	1	3	10	60	180	600	600	721	721	721	721
Age (years)	> 64	180	1	1	10	20	180	360	600	721	721	721	721	721
Race	White	968	0	1	5	10	60	180	600	600	721	721	721	721
Race	Black	100	1	3	6	13	60	180	600	600	600	661	721	721
Race	Asian	23	1	1	2	60	180	360	600	600	721	721	721	721
Race	Some Others	22	1	1	1	15	30	180	600	600	721	721	721	721
Race	Hispanic	45	0	0	5	5	45	180	360	600	600	721	721	721
Hispanic	No	1,073	0	1	3	10	60	180	600	600	721	721	721	721
Hispanic	Yes	81	0	1	5	10	45	180	360	600	600	721	721	721
Employment	Full Time	451	1	1	3	10	60	180	600	600	721	721	721	721
Employment	Part Time	93	0	3	5	15	60	180	600	600	721	721	721	721
Employment	Not Employed	362	1	1	5	10	60	360	600	600	721	721	721	721
Education	< High School	96	1	1	2	11	75	360	600	600	721	721	721	721
Education	High School Graduate	309	1	3	5	10	60	180	600	600	721	721	721	721
Education	< College	225	0	1	3	10	60	180	600	600	721	721	721	721
Education	College Graduate	150	0	1	1	15	60	180	600	600	721	721	721	721
Education	Post Graduate	124	2	2	3	5	30	180	600	600	721	721	721	721
Census Region	Northeast	223	1	2	5	10	90	180	600	600	721	721	721	721
Census Region	Midwest	221	0	0	2	10	60	180	600	600	721	721	721	721
Census Region	South	361	1	1	5	10	60	180	360	600	600	721	721	721
Census Region	West	365	0	1	5	15	60	180	600	600	721	721	721	721
Day of Week	Weekday	732	0	1	5	10	60	180	600	600	721	721	721	721
Day of Week	Weekend	438	1	1	5	10	60	180	600	600	721	721	721	721
Season	Winter	184	0	0	2	3	10	60	180	600	600	600	600	600
Season	Spring	407	1	1	5	20	180	360	600	600	721	721	721	721
Season	Summer	385	0	2	10	30	180	360	600	721	721	721	721	721
Season	Fall	194	1	1	2	10	30	180	360	600	600	600	600	600
Asthma	No	1,072	0	1	5	10	60	180	600	600	721	721	721	721
Asthma	Yes	97	1	1	3	6	30	180	600	600	721	721	721	721
Angina	No	1,133	0	1	5	10	60	180	600	600	721	721	721	721
Angina	Yes	36	1	1	3	10	105	360	360	600	721	721	721	721
Bronchitis/emphysema	No	1,105	0	1	3	10	60	180	600	600	721	721	721	721
Bronchitis/emphysema	Yes	63	5	5	10	10	90	180	600	600	600	721	721	721

N = Doer sample size.

Note: Values of "180", "360", "600","840" and "961" for number of minutes signify that 2-4 hours, 4-8 hours, 8-12 hours, 12-16 hours, and more than 16 hours, respectively, were spent. Percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 16-65. Mean Time Spent (hours/week)[a] in Ten Major Activity Categories Grouped by Regions

Activity	West *N* = 200	North Central *N* = 304	Northeast *N* = 185	South *N* = 286	Total[b] *N* = 975 Mean	Total[b] *N* = 975 SD[c]
Activity Category						
Market Work	23.44	29.02	27.34	24.21	26.15	23.83
House/yard work	14.64	14.17	14.29	15.44	14.66	12.09
Child care	2.50	2.82	2.32	2.66	2.62	5.14
Services/shop	5.22	5.64	4.92	4.72	5.15	5.40
Personal care	79.23	76.62	78.11	79.38	78.24	12.70
Education	2.94	1.43	0.95	1.45	1.65	6.34
Organizations	3.42	2.97	2.45	2.68	2.88	5.40
Social entertainment	8.26	8.42	8.98	8.22	8.43	8.17
Active leisure	5.94	5.28	4.77	5.86	5.49	7.81
Passive leisure	22.47	21.71	23.94	23.47	22.80	13.35
Total Time	168.00	168.00	168.00	168.00	168.00	0.09

[a] Weighted for day of week, panel loss (not defined in report), and correspondence to Census. Data may not add to totals shown due to rounding.
[b] *N* = surveyed population.
[c] SD = standard deviation.

Source: Hill (1985).

Table 16-66. Total Mean Time Spent (minutes/day) in Ten Major Activity Categories Grouped by Type of Day

	Time Duration (minutes/day)		
	Weekday [*N*[a] = 831]	Saturday [*N* = 831]	Sunday [*N* = 831]
Activity Category			
Market Work	288.0 (257.7)[b]	97.9 (211.9)	58.0 (164.8)
House/Yardwork	126.3 (119.3)	160.5 (157.2)	124.5 (133.3)
Child Care	26.6 (50.9)	19.4 (51.5)	24.8 (61.9)
Services/Shopping	48.7 (58.7)	64.4 (92.5)	21.6 (49.9)
Personal Care	639.2 (114.8)	706.8 (169.8)	734.3 (156.5)
Education	16.4 (64.4)	5.4 (38.1)	7.3 (48.0)
Organizations	21.1 (49.7)	18.4 (75.2)	58.5 (104.5)
Social Entertainment	54.9 (69.2)	1,114.1 (156.0)	110.0 (151.2)
Active Leisure	37.9 (71.11)	61.4 (126.5)	64.5 (120.6)
Passive Leisure	181.1 (121.9)	191.8 (161.6)	236.5 (167.1)
Total Time	1,440	1,440	1,440

[a] *N* = Number of respondents.
[b] ( ) = Numbers in parentheses are standard deviations.

Source: Hill (1985).

Table 16-67. Mean Time Spent (minutes/day) in Ten Major Activity Categories During 4 Waves of Interviews[a]

	Fall (Nov. 1, 1975)[b] *N* = 861	Spring (June 1, 1976)[b] *N* = 861	Spring (June 1, 1976)[b] *N* = 861	Summer (Sept. 21, 1976)[b] *N* = 861	Range of Standard Deviations
Activity Category	**Wave 1**	**Wave 2**	**Wave 3**	**Wave 4**	
Market work	222.94	226.53	210.44	230.92	272–287
House/yard work	133.16	135.58	143.10	119.95	129–156
Child care	25.50	22.44	25.51	21.07	49–58
Services/shop	48.98	44.09	44.61	47.75	76–79
Personal care	652.95	678.14	688.27	674.85	143–181
Education	22.79	12.57	2.87	10.76	32–93
Organizations	25.30	22.55	23.21	29.91	68–87
Social entertainment	63.87	67.11	83.90	72.24	102–127
Active leisure	42.71	47.46	46.19	42.30	96–105
Passive leisure	210.75	183.48	171.85	190.19	144–162
Total Time	1,440.00	1,440.00	1,440.00	1,440.00	--

[a] Weighted for day of week, panel loss (not defined in report), and correspondence to Census.
[b] Dates by which 50% of the interviews for each wave were taken.

Source: Hill (1985).

Table 16-68. Mean Time Spent (hours/week) in Ten Major Activity Categories Grouped by Sex[a]

	Time Duration (hours/week)					
	Men *N* = 140		Women *N* = 561		Men and Women *N* = 971	
Activity Category						
Market work	35.8	(23.6)[b]	17.9	(20.7)	26.2	(23.8)
House/yard	8.5	(9.0)	20.0	(11.9)	14.7	(12.1)
Child care	1.2	(2.5)	3.9	(6.4)	2.6	(5.2)
Services/shop	3.9	(4.5)	6.3	(5.9)	5.2	(5.4)
Personal care	77.3	(13.0)	79.0	(12.4)	78.2	(12.7)
Education	2.3	(7.7)	1.1	(4.8)	1.7	(6.4)
Organizations	2.5	(5.5)	3.2	(5.3)	2.9	(5.4)
Social entertainment	7.9	(8.3)	8.9	(8.0)	8.4	(8.2)
Active leisure	5.9	(8.2)	5.2	(7.4)	5.5	(7.8)
Passive leisure	22.8	(14.1)	22.7	(12.7)	22.8	(13.3)
Total time	168.1		168.1		168.1	

[a] Detailed components of activities (87) are presented in Table 1A-4 of the original study.
[b] ( ) = Numbers in parentheses are standard deviations.

Source: Hill (1985).

Table 16-69. Mean Time Spent (minutes/day) Performing Major Activities, by Age, Sex, and Type of Day

Activity	Age (3 to 11 years)				Age (12 to 17 years)			
	Weekday		Weekend		Weekday		Weekend	
	Boy (*N* = 118)	Girl (*N* = 111)	Boy (*N* = 118)	Girl (*N* = 111)	Boy (*N* = 77)	Girl (*N* = 83)	Boy (*N* = 77)	Girl (*N* = 83)
Market Work	16	0	7	4	23	21	58	25
Household Work	17	21	32	43	16	40	46	89
Personal Care	43	44	42	50	48	71	35	76
Eating	81	78	78	84	73	65	58	75
Sleeping	584	590	625	619	504	478	550	612
School	252	259	-	-	314	342	-	-
Studying	14	19	4	9	29	37	25	25
Church	7	4	53	61	3	7	40	36
Visiting	16	9	23	37	17	25	46	53
Sports	25	12	33	23	52	37	65	26
Outdoors	10	7	30	23	10	10	36	19
Hobbies	3	1	3	4	7	4	4	7
Art Activities	4	4	4	4	12	6	11	9
Playing	137	115	177	166	37	13	35	24
TV	117	128	181	122	143	108	187	140
Reading	9	7	12	10	10	13	12	19
Household Conversations	10	11	14	9	21	30	24	30
Other Passive Leisure	9	14	16	17	21	14	43	33
Unknown	22	25	20	29	14	17	10	4
Percent of Time Accounted for by Activities Above	94	92	93	89	93	92	88	89

N = Sample size.
- = No data

Source: Timmer et al. (1985).

Table 16-70. Mean Time Spent (minutes/day) in Major Activities, by Type of Day for 5 Different Age Groups

Activity	Weekday					Weekend					Significant Effect[a]
	Age (years)					Age (years)					
	3–5	6–8	9–11	12–14	15–17	3–5	6–8	9–11	12–14	15–17	
Market Work	-	14	8	14	28	-	4	10	29	48	
Personal Care	41	49	40	56	60	47	45	44	60	51	A, S, AxS (F > M)
Household Work	14	15	18	27	34	17	27	51	72	60	A, S, AxS (F > M)
Eating	82	81	73	69	67	81	80	78	68	65	A
Sleeping	630	595	548	473	499	634	641	596	604	562	A
School	137	292	315	344	314	-	-	-	-	-	
Studying	2	8	29	33	33	1	2	12	15	30	A
Church	4	9	9	9	3	55	56	53	32	37	A
Visiting	14	15	10	21	20	10	8	13	22	56	A (Weekend Only)
Sports	5	24	21	40	46	3	30	42	51	37	A, S (M > F)
Outdoor Activities	4	9	8	7	11	8	23	39	25	26	
Hobbies	0	2	2	4	6	1	5	3	8	3	
Art Activities	5	4	3	3	12	4	4	4	7	10	
Other Passive Leisure	9	1	2	6	4	6	10	7	10	18	A
Playing	218	111	65	31	14	267	180	92	35	21	A, S (M > F)
TV	111	99	146	142	108	122	136	185	169	157	A, S, AxS (M > F)
Reading	5	5	9	10	12	4	9	10	10	18	A
Being Read to	2	2	0	0	0	3	2	0	0	0	A
Unknown	30	14	23	25	7	52	7	14	4	9	A

[a] Effects are significant for weekdays and weekends, unless otherwise specified. A = age effect, $p < 0.05$, for both weekdays and weekend activities; S = sex effect $p < 0.05$, F > M, M > F = females spend more time than males, or vice versa; and AxS = age by sex interaction, $p < 0.05$.

- = No data.

Source: Timmer et al. (1985).

Table 16-71. Mean Time Spent (hours/day) Indoors and Outdoors, by Age and Day of the Week

Age Group	Indoors[a]		Outdoors[b]	
	Weekday	Weekend	Weekday	Weekend
3 to 5 years	19.4	18.9	2.5	3.1
6 to 8 years	20.7	18.6	1.8	2.5
9 to 11 years	20.8	18.6	1.3	2.3
12 to 14 years	20.7	18.5	1.6	1.9
15 to 17 years	19.9	17.9	1.4	2.3

[a] Time indoors was estimated by adding the average times spent performing indoor activities (household work, personal care, eating, sleeping, attending school, studying, attending church, watching television, and engaging in conversation) and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., market work, sports, hobbies, art activities, playing, reading, and other passive leisure).

[b] Time outdoors was estimated by adding the average time spent in outdoor activities and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., market work, sports, hobbies, art activities, playing, reading, and other passive leisure).

Source: Adapted from Timmer et al. (1985).

Table 16-72. Mean Time Spent (minutes/day) in Various Microenvironments by Age Group (years) for the National and California Surveys

Microenvironment	National Data Mean Duration (Standard Error)									
	Age 12–17 *N* = 340[a]	Doer[b]	Age 18–24 *N* = 340	Doer	Age 24–44 *N* = 340	Doer	Age 45–64 *N* = 340	Doer	Age 65+ *N* = 340	Doer
Autoplaces	2 (1)	73	7 (2)	137	2 (1)	43	4 (1)	73	4 (2)	57
Restaurant/bar	9 (2)	60	28 (3)	70	25 (3)	86	19 (2)	67	20 (5)	74
In-vehicle/internal combustion	79 (7)	88	103 (8)	109	94 (4)	101	82 (5)	91	62 (5)	80
In-vehicle/other	0 (0)	12	1 (1)	160	1 (0)	80	1 (1)	198	1 (1)	277
Physical/outdoors	32 (8)	130	17 (4)	110	19 (4)	164	7 (1)	79	15 (4)	81
Physical/indoors	15 (3)	87	8 (2)	76	7 (1)	71	7 (2)	77	7 (1)	51
Work/study-residence	22 (4)	82	19 (6)	185	16 (2)	181	9 (2)	169	5 (3)	297
Work/study-other	159 (14)	354	207 (20)	391	220 (11)	422	180 (13)	429	35 (6)	341
Cooking	11 (3)	40	18 (2)	39	38 (2)	57	43 (3)	64	50 (5)	65
Other activities/kitchen	53 (4)	64	42 (3)	55	70 (4)	86	90 (6)	101	108 (9)	119
Chores/child	91 (7)	92	124 (9)	125	133 (6)	134	121 (6)	122	119 (7)	121
Shop/errands	26 (4)	68	31 (4)	65	33 (2)	66	33 (3)	67	35 (5)	69
Other/outdoors	70 (13)	129	34 (4)	84	48 (6)	105	60 (7)	118	82 (13)	140
Social/cultural	87 (10)	120	100 (12)	141	56 (3)	94	73 (6)	116	85 (8)	122
Leisure-eat/indoors	237 (16)	242	181 (11)	189	200 (8)	208	238 (11)	244	303 (20)	312
Sleep/indoors	548 (31)	551	511 (26)	512	479 (14)	480	472 (15)	472	507 (26)	509

Microenvironment	CARB Data Mean Duration (Standard Error)									
	Age 12–17 *N* = 340[a]	Doer	Age 18–24 *N* = 340	Doer	Age 24–44 *N* = 340	Doer	Age 45–64 *N* = 340	Doer	Age 65+ *N* = 340	Doer
Autoplaces	16 (8)	124	16 (4)	71	25 (9)	114	20 (5)	94	9 (2)	53
Restaurant/bar	16 (4)	44	40 (8)	98	44 (5)	116	31 (4)	82	25 (7)	99
In-vehicle/internal combustion	78 (11)	89	111 (13)	122	98 (5)	111	100 (11)	117	63 (8)	89
In-vehicle/other	1 (0)	19	3 (1)	60	5 (2)	143	2 (1)	56	2 (1)	53
Physical/outdoors	32 (7)	110	13 (3)	88	17 (3)	128	14 (3)	123	15 (4)	104
Physical/indoors	20 (4)	65	5 (2)	77	6 (1)	61	5 (1)	77	3 (1)	48
Work/study-residence	25 (5)	76	30 (11)	161	7 (2)	137	10 (3)	139	5 (3)	195
Work/study-other	196 (30)	339	201 (24)	344	215 (14)	410	173 (20)	429	30 (11)	336
Cooking	3 (1)	19	14 (2)	40	32 (2)	59	31 (3)	68	41 (7)	69
Other activities/kitchen	31 (4)	51	31 (5)	55	43 (3)	65	62 (6)	91	97 (14)	119
Chores/child	72 (11)	77	79 (8)	85	110 (6)	119	99 (8)	109	123 (15)	141
Shop/errands	14 (3)	50	35 (7)	71	33 (4)	71	32 (3)	77	35 (5)	76
Other/outdoors	58 (8)	78	80 (15)	130	68 (8)	127	76 (12)	134	55 (7)	101
Social/cultural	63 (14)	109	65 (10)	110	50 (5)	122	50 (5)	107	49 (7)	114
Leisure-eat/indoors	260 (27)	270	211 (19)	234	202 (9)	215	248 (15)	261	386 (34)	394
Sleep/indoors	557 (44)	560	506 (30)	510	487 (17)	491	485 (23)	491	502 (31)	502

[a] All *N*'s are weighted number.

[b] Doer = Respondents who reported participating in each activity/location spent in microenvironments.

Source: Robinson and Thomas (1991).

Table 16-73. Mean Time Spent in Ten Major Activity Categories Grouped by Total Sample and Sex for the CARB and National Studies (age 18–64 years)

Activity Category	Time Duration (minutes/day)					
	CARB (1987–1988)	National (1985)	CARB (1987–1988)		National (1985)	
	Total Sample		Men	Women	Men	Women
	N^a = 1,359	N = 1,980	N = 639	N = 720	N = 921	N = 1,059
Paid Work	273	252	346	200	323	190
Household Work	102	118	68	137	79	155
Child Care	23	25	12	36	11	43
Obtaining Goods and Services	61	55	48	73	44	62
Personal Needs and Care	642	642	630	655	636	645
Education and Training	22	19	25	20	21	16
Organizational Activities	12	17	11	13	12	20
Entertainment/Social Activities	60	62	57	55	64	62
Recreation	43	50	53	31	69	43
Communication	202	196	192	214	197	194

[a] N = total diary days.

Source: Robinson and Thomas (1991).

Table 16-74. Total Mean Time Spent at 3 Major Locations Grouped by Total Sample and Sex for the CARB and National Study (age 18–64 years)

Location[a]	CARB (1987–1988)	National (1985)	CARB (1987–1988)		National (1985)	
	Total Sample		Men	Women	Men	Women
	N^a = 1,359	N = 1,980	N = 39	N = 720	N = 921	N = 1,059
At Home	892	954	822	963	886	1,022
Away From Home	430	384	487	371	445	324
Travel	116	94	130	102	101	87
Not Ascertained	2	8	1	4	8	7
Total Time	1,440	1,440	1,440	1,440	1,440	1,440

[a] N = total diary days.

Source: Robinson and Thomas (1991).

Table 16-75. Mean Time Spent at 3 Locations for Both CARB and National Studies (ages 12 years and older)

Location Category	Mean Duration (minutes/day)			
	CARB (N = 1,762)[a]	SE[b]	National (N = 2,762)[a]	SE
Indoor	1,255[c]	28	1,279[c]	21
Outdoor	86[d]	5	74[d]	4
In-Vehicle	98[d]	4	87[d]	2
Total Time Spent	1,440		1,440	

[a] N = Weighted Number – National sample population was weighted to obtain a ratio of 46.5 males and 53.5 females, in equal proportion for each day of the week, and for each quarter of the year.
[b] SE = Standard error of mean.
[c] Difference between the mean values for the CARB and national studies is not statistically significant.
[d] Difference between the mean values for the CARB and national studies is statistically significant at the 0.05 level.

Source: Robinson and Thomas (1991).

Table 16-76. Sample Sizes for Sex and Age Groups

Age Group	Group	Sample Size	Age Range
Adults	Men	724	≥18 years
	Women	855	≥18 years
Adolescents	Male	98	12–17 years
	Female	85	12–17 years
Children[a]	Young male	145	6–8 years
	Young female	124	6–8 years
	Old male	156	9–11 years
	Old female	160	9–11 years

[a] Children under the age of 6 are excluded for the present study (too few responses in CARB study).

Source: Funk et al. (1998).

Table 16-77. Assignment of At Home Activities to Inhalation Rate Levels for All Individuals

Children		Adolescent and Adult		
Low	Moderate	Low	Moderate	High
Watching child care	Outdoor cleaning	Night sleep	Food preparation	Outdoor cleaning
Night sleep	Food Preparation	Naps/resting	Food clean-up	
Watch personal care	Metal clean-up	Doing homework	Cleaning house	
Homework	Cleaning house	Radio use	Clothes care	
Radio use	Clothes care	TV use	Car care	
TV use	Car/boat repair	Records/tapes	Household repairs	
Records/tapes	Home repair	Read books	Plant care	
Reading books	Plant care	Read magazines	Animal care	
Reading magazines	Other household	Writing/paperwork	Other household	
Reading newspapers	Pet care	Other passive leisure	Baby care	
Letters/writing	Baby care		Child care	
Other leisure	Child care		Helping/teaching	
Homework/watch TV	Helping/teaching		Talking/reading	
Reading/TV	Talking/reading		Indoor playing	
Reading/listen music	Indoor playing		Outdoor playing	
Paperwork	Outdoor playing		Medical child care	
	Medical child care		Washing	
	Washing, hygiene		Medical care	
	Medical care		Help and care	
	Help and care		Meals at home	
	Meals at home		Dressing/grooming	
	Dressing		Not ascertained	
	Visiting at home		Visiting at home	
	Hobbies		Hobbies	
	Domestic crafts		Domestic crafts	
	Art		Art	
	Music/dance/drama		Music/drama/dance	
	Indoor dance		Games	
	Conservations		Computer use	
	Painting room/home		Conversations	
	Building fire			
	Washing/dressing			
	Outdoor play			
	Playing/eating			
	Playing/talking			
	Playing/watch TV			
	TV/eating			
	TV/something else			
	Reading book/eating			
	Read magazine/eat			
	Read newspaper/eat			

Source: Funk et al. (1998).

Table 16-78. Aggregate Time Spent (minutes/day) at Home in Activity Groups[a]

Activity Group	Adult		Adolescent		Children	
	Mean	SD	Mean	SD	Mean	SD
Low	702	214	789	230	823	153
Moderate	257	183	197	131	241[b]	136
High	9	38	1	11	3	17
$High_{participants}$[c]	92	83	43	72	58	47

[a] Time spent engaging in all activities embodied by inhalation rate category (minutes/day).
[b] Significantly different from adolescents ($p < 0.05$).
[c] Participants in high inhalation rate level activities (i.e., doers).
SD = Standard deviation.

Source: Funk et al. (1998).

Table 16-79. Comparison of Mean Time Spent (minutes/day) at Home, by Sex[a]

Activity Group	Male		Female	
	Mean	SD	Mean	SD
Adults				
Low	691	226	714	200
Moderate	190	150	323[b]	189
High	14	50	4[b]	18
$High_{participants}$[c]	109	97	59[b]	40
Adolescents				
Low	775	206	804	253
Moderate	181	126	241	134
High	2	16	0	0

[a] Time spent engaging in all activities embodied by inhalation rate category (minutes/day).
[b] Significantly different from male ($p < 0.05$).
[c] Participants in high inhalation rate activities (i.e., doers).
SD = Standard deviation.

Source: Funk et al. (1998).

Table 16-80. Comparison of Mean Time Spent (minutes/day) at Home, by Sex and Age for Children[a]

Activity Group	Male				Female			
	6 to 8 Years		9 to 11 Years		6 to 8 Years		9 to 11 Years	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low	806	134	860	157	828	155	803	162
Moderate	259	135	198	111	256	141	247	146
High	3	17	7	27	1	9	2	10
$High_{participant}$[b]	77	59	70	54	68	11	30	23

[a] Time spent engaging in all activities embodied by inhalation rate category (minutes/day).
[b] Participants in high inhalation rate activities (i.e., doers).
SD = Standard deviation.

Source : Funk et al. (1998).

Table 16-81. Number of Person-Days/Individuals[a] for Children Less Than 12 Years in CHAD Database

Age Group	All Studies	California[b]	Cincinnati[c]	NHAPS-Air	NHAPS-Water
0 Years	223/199	104	36/12	39	44
0 to 6 Months	-	50	15/5	-	-
6 to 12 Months	-	54	21/7	-	-
1 Year	259/238	97	31/11	64	67
12 to 18 Months	-	57	-	-	-
18 to 24 Months	-	40	-	-	-
2 Years	317/264	112	81/28	57	67
3 Years	278/242	113	54/18	51	60
4 Years	259/232	91	41/14	64	63
5 Years	254/227	98	40/14	52	64
6 Years	237/199	81	57/19	59	40
7 Years	243/213	85	45/15	57	56
8 Years	259/226	103	49/17	51	55
9 Years	229/195	90	51/17	42	46
10 Years	224/199	105	38/13	39	42
11 Years	227/206	121	32/11	44	30
Total	3,009/2,640	1,200	556/187	619	634

[a] The number of person-days of data are the same as the number of individuals for all studies except for the Cincinnati study. Since up to 3 days of activity pattern data were obtained from each participant in this study, the number of person-days of data is approximately 3 times the number of individuals.
[b] The California study referred to in this table is the Wiley et al. (1991) study.
[c] The Cincinnati study referred to in this table is the Johnson (1989) study.
- = No data.

Source: Cohen Hubal et al. (2000).

Table 16-82. Time Spent (hours/day) in Various Microenvironments, by Age

Age (years)	Average Time ± Standard Deviation (Percent > 0 Hours)				
	Indoors at Home	Outdoors at Home	Indoors at School	Outdoors at Park	In Vehicle
0	19.6 ± 4.3 (99)	1.4 ± 1.5 (20)	3.5 ± 3.7 (2)	1.6 ± 1.5 (9)	1.2 ± 1.0 (65)
1	19.5 ± 4.1 (99)	1.6 ± 1.3 (35)	3.4 ± 3.8 (5)	1.9 ± 2.7 (10)	1.1 ± 0.9 (66)
2	17.8 ± 4.3 (100)	2.0 ± 1.7 (46)	6.2 ± 3.3 (9)	2.0 ± 1.7 (17)	1.2 ± 1.5 (76)
3	18.0 ± 4.2 (100)	2.1 ± 1.8 (48)	5.7 ± 2.8 (14)	1.5 ± 0.9 (17)	1.4 ± 1.9 (73)
4	17.3 ± 4.3 (100)	2.4 ± 1.8 (42)	4.9 ± 3.2 (16)	2.3 ± 1.9 (20)	1.1 ± 0.8 (78)
5	16.3 ± 4.0 (99)	2.5 ± 2.1 (52)	5.4 ± 2.5 (39)	1.6 ± 1.5 (28)	1.3 ± 1.8 (80)
6	16.0 ± 4.2 (98)	2.6 ± 2.2 (48)	5.8 ± 2.2 (34)	2.1 ± 2.4 (32)	1.1 ± 0.8 (79)
7	15.5 ± 3.9 (99)	2.6 ± 2.0 (48)	6.3 ± 1.3 (40)	1.5 ± 1.0 (28)	1.1 ± 1.1 (77)
8	15.6 ± 4.1 (99)	2.1 ± 2.5 (44)	6.2 ± 1.1 (41)	2.2 ± 2.4 (37)	1.3 ± 2.1 (82)
9	15.2 ± 4.3 (99)	2.3 ± 2.8 (49)	6.0 ± 1.5 (39)	1.7 ± 1.5 (34)	1.2 ± 1.2 (76)
10	16.0 ± 4.4 (96)	1.7 ± 1.9 (40)	5.9 ± 1.5 (39)	2.2 ± 2.3 (40)	1.1 ± 1.1 (82)
11	14.9 ± 4.6 (98)	1.9 ± 2.3 (45)	5.9 ± 1.5 (41)	2.0 ± 1.7 (44)	1.6 ± 1.9 (74)

Source: Cohen Hubal et al. (2000).

Table 16-83. Mean Time Children Spent (hours/day) Doing Various Macroactivities While Indoors at Home

Age (years)	Mean Time (Percent > 0 Hours)						
	Eat	Sleep or Nap	Shower or Bath	Play Games	Watch TV or Listen to Radio	Read, Write, Homework	Think, Relax, Passive
0	1.9 (96)	12.6 (99)	0.4 (44)	4.3 (29)	1.1 (9)	0.4 (4)	3.3 (62)
1	1.5 (97)	12.1 (99)	0.5 (56)	3.9 (68)	1.8 (41)	0.6 (19)	2.3 (20)
2	1.3 (92)	11.5 (100)	0.5 (53)	2.5 (59)	2.1 (69)	0.6 (27)	1.4 (18)
3	1.2 (95)	11.3 (99)	0.4 (53)	2.6 (59)	2.6 (81)	0.8 (27)	1.0 (19)
4	1.1 (93)	10.9 (100)	0.5 (52)	2.6 (54)	2.5 (82)	0.7 (31)	1.1 (17)
5	1.1 (95)	10.5 (98)	0.5 (54)	2.0 (49)	2.3 (85)	0.8 (31)	1.2 (19)
6	1.1 (94)	10.4 (98)	0.4 (49)	1.9 (35)	2.3 (82)	0.9 (38)	1.1 (14)
7	1.0 (93)	9.9 (99)	0.4 (56)	2.1 (38)	2.5 (84)	0.9 (40)	0.6 (10)
8	0.9 (91)	10.0 (96)	0.4 (51)	2.0 (35)	2.7 (83)	1.0 (45)	0.7 (7)
9	0.9 (90)	9.7 (96)	0.5 (43)	1.7 (28)	3.1 (83)	1.0 (44)	0.9 (17)
10	1.0 (86)	9.6 (94)	0.4 (43)	1.7 (38)	3.5 (79)	1.5 (47)	0.6 (10)
11	0.9 (89)	9.3 (94)	0.4 (45)	1.9 (27)	3.1 (85)	1.1 (47)	0.6 (10)

Source: Cohen Hubal et al. (2000).

Table 16-84. Time Children Spent (hours/day) in Various Microenvironments, by Age Recast Into New Standard Age Categories

Age Group	*N*	Indoors at Home		Outdoors at Home		Indoors at School		Outdoors at Park		In Vehicle	
		Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing
Birth to <1 month	123	19.6	98	1.7	21	4.3	3	1.3	3	1.3	63
1 to <3 months	33	20.9	100	1.8	9	0.2	3	1.6	9	1.3	27
3 to <6 months	120	19.6	100	0.8	8	7.8	7	1.3	6	1.1	14
6 to <12 months	287	19.1	99	1.1	15	7.6	8	1.8	5	1.3	14
1 to <2 years	728	19.2	99	1.4	34	6.4	9	1.5	5	1.1	27
2 to <3 years	765	18.2	99	1.8	38	6.8	12	2.1	7	1.3	28
3 to <6 years	2,110	17.3	100	1.9	43	5.9	26	1.6	10	1.3	29
6 to <11 years	3,283	15.7	99	1.9	40	6.5	44	2.1	17	1.1	29
11 to <16 years	2,031	15.5	97	1.7	30	6.6	45	2.6	15	1.3	42
16 to <21 years	1,005	14.6	98	1.4	20	5.7	33	3.1	10	1.7	90

N = Sample size.

Source: Based on data source (CHAD) used by Cohen Hubal et al. (2000).

Table 16-85. Time Children Spent (hours/day) in Various Macroactivities While Indoors at Home Recast Into New Standard Age Categories

Age Group	*N*	Eat		Sleep or Nap		Shower or Bath		Play Game		Watch TV/ Listen to Radio		Read, Write, Homework		Think, Relax, Passive	
		Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing
Birth to <1 month	123	2.2	98	13.0	100	0.5	41	5.0	53	1.3	8	0.7	2	2.7	48
1 to <3 months	33	2.4	100	14.8	100	0.4	24	0.7	6	1.6	15	0.0	0	3.5	79
3 to <6 months	120	2.0	100	13.5	100	0.5	9	1.3	31	1.0	21	1.1	3	2.5	59
6 to <12 months	287	1.8	100	12.9	100	0.4	11	1.1	30	1.3	25	0.5	4	2.5	35
1 to <2 years	728	1.7	99	12.5	100	0.5	21	3.2	45	1.8	52	0.6	13	1.4	26
2 to <3 years	765	1.5	98	12.0	100	0.5	22	2.6	45	2.0	77	0.6	18	0.8	30
3 to <6 years	2,110	1.4	99	11.2	100	0.5	38	2.5	38	2.3	86	0.7	25	0.8	28
6 to <11 years	3,283	1.2	98	10.2	100	0.4	54	2.0	28	2.6	84	1.0	43	0.8	20
11 to <16 years	2,031	1.1	94	9.7	98	0.4	50	1.8	18	3.0	85	1.4	45	0.8	20
16 to <21 years	1,005	1.0	84	8.9	98	0.4	45	1.9	5	3.2	73	2.2	37	1.3	24

N = Sample size.

Source: Based on data source (CHAD) used by Cohen Hubal et al. (2000).

Table 16-86. Number and Percentage of Respondents With Children and Those Reporting Outdoor Play[a] Activities in Both Warm and Cold Weather

Source	Respondents with Children	Child Player[a]		Child Non-Player		Warm Weather Player[b]	Cold Weather Player	Player in Both Seasons
	N	*N*	%	*N*	%	*N*	*N*	%
SCS-II base	197	128	65.0	69	35.0	127	100	50.8
SCS-II over sample	483	372	77.0	111	23.0	370	290	60.0
Total	680	500	73.5	180	26.5	497	390	57.4

[a] "Play" and "player" refer specifically to participation in outdoor play on bare dirt or mixed grass and dirt.
[b] Does not include three "Don't know/refused" responses regarding warm weather play.
N = Sample size.

Source: Wong et al. (2000).

Table 16-87. Play Frequency and Duration for All Child Players (from SCS-II data)

Statistic	Cold Weather			Warm Weather		
	Frequency (days/week)	Duration (hours/day)	Total (hours/week)	Frequency (days/week)	Duration (hours/day)	Total (hours/week)
N	372	374	373	488	479	480
5th Percentile	1	1	1	2	1	4
50th Percentile	3	1	5	7	3	20
95th Percentile	7	4	20	7	8	50

N = Sample size.

Source: Wong et al. (2000).

Table 16-88. Hand Washing and Bathing Frequency for All Child Players (from SCS-II data)

Statistic	Cold Weather		Warm Weather	
	Hand Washing (times/day)	Bathing (times/week)	Hand Washing (times/day)	Bathing (times/week)
N	329	388	433	494
5th Percentile	2	2	2	3
50th Percentile	4	7	4	7
95th Percentile	10	10	12	14

N = Sample size.

Source: Wong et al. (2000).

Table 16-89. NHAPS and SCS-II Play Duration[a] Comparison (children only)

Data Source	Mean Play Duration (minutes/day)			χ^2 test[b]
	Cold Weather	Warm Weather	Total	
NHAPS	114	109	223	$p < 0.0001$
SCS-II	102	206	308	

[a] Selected previous day activities in NHAPS; average day outdoor play on bare dirt or mixed grass and dirt in SCS-II.
[b] 2×2 Chi-square test for contingency between NHAPS and SCS-II.

Source: Wong et al. (2000).

Table 16-90. NHAPS and SCS-II Hand Wash Frequency[a] Comparison (children only)

Data Source	Season	Percent[b] Reporting Frequency (times/day) of:								χ^2 test[c]
		0	1–2	3–5	6–9	10–19	20–29	30+	"Don't Know"	
NHAPS	Cold	3	18	51	17	7	1	1	3	$p = 0.06$
SCS-II	Cold	1	16	50	11	7	1	0	15	
NHAPS	Warm	3	18	51	15	7	2	1	4	$p = 0.001$
SCS-II	Warm	0	12	46	16	10	1	0	13	

[a] Selected previous day activities in NHAPS; average day outdoor play on bare dirt or mixed grass and dirt in SCS-II.
[b] Results are reported as percentage of total for clarity. Incidence data were used in statistical tests.
[c] 2×2 Chi-square test for contingency between NHAPS and SCS-II.

Source: Wong et al. (2000).

Table 16-91. Time Spent (minutes/day) Outdoors Based on CHAD Data (doers only)[a]

Age Group	*N*	Time Spent Outdoors					COV(%)	Participation[b] (%)
		Minimum	Median	Maximum	Mean	SD		
<1 month	57	2	60	700	99	124	125	47
1 to 2 months	5	4	60	225	102	90	89	36
3 to 5 months	27	10	90	510	114	98	86	23
6 to 11 months	91	5	60	450	91	76	84	33
1 year	389	1	75	1,035	102	99	97	58
2 years	448	1	100	550	134	108	80	64
3 to 5 years	1,336	1	120	972	146	117	80	68
6 to 10 years	2,216	1	120	1,440	162	144	89	71
11 to 15 years	1,423	1	110	1,440	154	163	106	73
16 to 17 years	356	1	85	1,083	129	145	112	81
18 to 20 years	351	1	70	788	132	155	118	72
21 to 44 years	3,660	1	61	1,305	131	165	126	62
45 to 64 years	1,914	1	69	1,015	135	162	120	62
>64 years	1,002	1	65	840	118	130	110	57

[a] Only data for individuals that spent >0 time outdoors and had 30 or more records are included in the analysis.

[b] Participation rates or percent of sample days in the study spending some time (>0 minutes per day) outdoors. The mean time spent outdoors for the age group may be obtained by multiplying the participation rate by the mean time shown above.

SD = Standard deviation.

COV = Coefficient of variation (SD/mean × 100).

Source: Graham and McCurdy (2004).

Table 16-92. Comparison of Daily Time Spent Outdoors (minutes/day), Considering Sex and Age Cohort (doers only)[a]

Age Group	Sex	*N*	Time Spent Outdoors in Minutes					COV (%)	K-S Test[b]			
			Minimum	Median	Maximum	Mean	SD		D_n	χ^2	*p*	Reject H_0
<1 month	Male	35	7	69	700	116	144	125	0.24	0.90X	0.3964	No
	Female	22	2	58	333	73	78	106				
1 to 2 months	Male	4	4	58	165	71	68	95				
	Female	1	225	225	225	225	-	0		Cannot Test		
3 to 5 months	Male	20	10	86	210	89	56	63	0.42	0.96	0.3158	No
	Female	7	50	140	510	187	153	81				
6 to 11 months	Male	53	10	60	450	95	83	87	0.07	1.00	0.3200	No
	Female	38	5	68	270	86	67	77				
1 year	Male	184	1	80	1,035	110	114	104	0.07	0.71	0.6896	No
	Female	205	4	70	511	95	82	86				
2 years	Male	232	1	105	550	136	105	77	0.09	1.00	0.2705	No
	Female	216	2	90	525	131	111	84				
3 to 5 years	Male	723	1	120	972	146	119	81	0.04	0.74	0.6465	No
	Female	612	2	120	701	144	113	78				
6 to 10 years	Male	1,228	1	132	1,440	173	148	86	0.09	2.05	0.0004	Yes
	Female	987	2	115	1,380	148	138	93				
11 to 15 years	Male	779	1	125	1,440	171	169	99	0.17	3.12	<0.0001	Yes
	Female	640	1	90	1,371	134	153	114				
16 to 17 years	Male	168	2	113	810	151	147	97	0.19	1.80	0.0030	Yes
	Female	188	1	68	1,083	109	141	127				
18 to 20 years	Male	184	2	95	788	162	176	109	0.20	1.84	0.0023	Yes
	Female	167	1	50	606	99	119	120				
21 to 44 years	Male	1,702	1	82	1,005	164	191	117	0.14	4.23	<0.0001	Yes
	Female	1,956	1	55	1,305	103	133	129				
45 to 64 years	Male	839	1	91	1,015	178	193	109	0.18	3.90	<0.0001	Yes
	Female	1,075	1	58	930	102	124	121				
>64 years	Male	396	2	118	840	164	156	96	0.25	3.81	<0.0001	Yes
	Female	605	1	60	630	88	98	111				

[a] Only data for individuals that spent >0 time outdoors and had 30 or more records are included in the analysis.
[b] The 2-sample Kolmogoroz-Smirnov (K-S) test H_0 is that the distribution of variable 1 is the same as variable 2, using D_n (test statistic) and a χ^2 test statistic at $\alpha = 0.050$.
- Data not available.
SD = Standard deviation.
COV = Coefficient of variation (SD/mean × 100).

Source: Graham and McCurdy (2004).

Table 16-93. Time Spent (minutes/day) Indoors Based on CHAD Data (doers only)[a]

Age Group	*N*	Time Spent Indoors					COV (%)	Participation[b] (%)
		Minimum	Median	Maximum	Mean	SD		
<1 month	121	490	1,380	1,440	1,336	137	10	100.0
1 to 2 months	14	1,125	1,380	1,440	1,348	105	8	100.0
3 to 5 months	115	840	1,385	1,440	1,359	93	7	100.0
6 to 11 months	278	840	1,370	1,440	1,353	81	6	100.0
1 year	668	315	1,350	1,440	1,324	107	8	100.0
2 years	700	290	1,319	1,440	1,286	138	11	100.0
3 to 5 years	1,977	23	1,307	1,440	1,276	136	11	100.0
6 to 10 years	3,118	7	1,292	1,440	1,256	153	12	100.0
11 to 15 years	1,939	69	1,300	1,440	1,255	160	13	99.8
16 to 17 years	438	161	1,296	1,440	1,251	171	14	100.0
18 to 20 years	485	512	1,310	1,440	1,242	180	15	100.0
21 to 44 years	5,872	60	1,317	1,440	1,259	176	14	100.0
45 to 64 years	3,073	23	1,320	1,440	1,262	172	14	100.0
>64 years	1,758	600	1,350	1,440	1,310	141	11	100.0

[a] Only data for individuals that spent >0 time indoors and had 30 or more records are included in the analysis.

[b] Participation rates or percent of sample days in the study spending some time (>0 minutes/day) indoors. The mean time spent indoors for the age group may be obtained by multiplying the participation rate (as a decimal) by the mean time shown above.

N = Sample size.

SD = Standard deviation.

COV = Coefficient of variation (SD/mean × 100).

Source: Graham and McCurdy (2004).

Table 16-94. Time Spent (minutes/day) in Motor Vehicles Based on CHAD Data (doers only)[a]

Age Group	*N*	Time Spent in Motor Vehicle					COV (%)	Participation[b] (%)
		Minimum	Median	Maximum	Mean	SD		
<1 month	80	2	68	350	86	68	79	66
1 to 2 months	9	20	83	105	67	32	48	64
3 to 5 months	75	13	60	335	71	49	69	65
6 to 11 months	226	4	51	425	62	47	76	81
1 year	515	1	52	300	67	50	76	77
2 years	581	2	54	955	73	76	104	83
3 to 5 years	1,702	1	55	1,389	70	70	99	86
6 to 10 years	2,766	1	58	1,214	71	68	95	89
11 to 15 years	1,685	1	60	825	76	74	97	87
16 to 17 years	400	4	73	1,007	92	90	98	91
18 to 20 years	449	4	76	852	109	106	98	93
21 to 44 years	5,429	1	80	1,440	105	100	96	92
45 to 64 years	2,739	1	75	1,357	102	105	103	89
>64 years	1,259	4	60	798	86	85	99	72

[a] Only data for individuals that spent >0 time in motor vehicles and had 30 or more records are included in the analysis.

[b] Participation rates or percent of sample days in the study spending some time (>0 minutes/day) in motor vehicles. The mean time spent in motor vehicles for the age group may be obtained by multiplying the participation rate (as a decimal) by the mean time shown above.

N = Sample size.

SD = Standard deviation.

COV = Coefficient of variation (SD/mean × 100).

Source: Graham and McCurdy (2004).

Table 16-95. Mean Time Spent (minutes/day) in Various Activity Categories, by Age—Weekday (children only)

Activity Category	2002–2003				1981–1982			
	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years
Market work	0	0	1	22	-	-	-	28
Household work	25	32	38	39	15	18	27	34
Personal care	68	66	68	73	49	40	56	60
Eating	60	57	54	49	81	73	69	67
Sleeping, naps	607	583	542	515	595	548	473	499
School	406	398	395	352	292	315	344	314
Studying	29	39	49	50	8	29	33	33
Church	4	5	5	3	9	9	9	3
Visiting, socializing	16	25	25	53	-	-	-	-
Sports	10	17	33	33	24	21	40	46
Outdoor Activities	6	6	4	6	9	8	7	11
Hobbies	1	1	1	2	2	2	4	6
Art Activities	8	7	7	4	4	3	3	12
Television	94	106	111	115	99	146	142	108
Other passive leisure	9	10	24	39	-	-	-	-
Playing	74	56	45	35	111	65	31	14
Reading	11	12	11	7	5	9	10	12
Being read to	2	1	0	0	-	-	-	-
Computer activities	6	10	25	38	-	-	-	-
Missing data	4	8	4	6	-	-	-	-

- Data not provided.

Source: Juster et al. (2004).

Table 16-96. Mean Time Spent (minutes/day) in Various Activity Categories, by Age—Weekend Day (children only)

Activity Category	2002–2003				1981–1982			
	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years
Market work	0	0	9	39	-	-	-	48
Household work	81	91	100	79	27	51	72	60
Personal care	78	72	73	77	45	44	60	51
Eating	89	80	69	64	80	78	68	65
Sleeping, naps	666	644	633	629	641	596	604	562
School	3	6	7	7	-	-	-	-
Studying	5	9	20	24	2	12	15	30
Church	41	37	36	30	56	53	32	37
Visiting, socializing	61	66	58	91	-	-	-	-
Sports	23	40	40	27	30	42	51	37
Outdoor Activities	12	12	12	11	23	39	25	26
Hobbies	2	1	4	5	5	3	8	3
Art Activities	11	7	9	6	4	4	7	10
Television	155	184	181	162	136	185	169	157
Other passive leisure	14	15	40	54	-	-	-	-
Playing	163	134	148	59	180	92	35	21
Reading	14	15	13	7	9	10	10	18
Being read to	1	1	0	0	-	-	-	-
Computer activities	12	19	39	58	-	-	-	-
Missing data	9	8	9	11	-	-	-	-

- Data not provided.

Source: Juster et al. (2004).

Table 16-97. Mean Time Spent (minutes/week) in Various Activity Categories for Children, Ages 6 to 17 Years

Activity Category	2002–2003	1981–1982
Market work	53	126
Household work	343	223
Personal care	493	356
Eating	426	508
Sleeping, naps	4,092	3,758
School	1,947	1,581
Studying	238	158
Church	94	125
Visiting, socializing	287	132
Sports	179	244
Outdoor Activities	50	100
Hobbies	12	27
Art Activities	48	40
Television	876	944
Other passive leisure	166	39
Playing	485	440
Reading	77	69
Being read to	5	3
Computer activities	165	0
Missing data	45	1,206

Source: Juster et al. (2004).

Table 16-98. Time Spent (minutes/2-day period)[a] in Various Activities by Children Participating in the Panel Study of Income Dynamics (PSID), 1997 Child Development Supplement (CDS)

Age Group	Boys (*N* = 1,444)		Girls (*N* = 1,387)	
	Mean[a]	Standard Deviation	Mean[a]	Standard Deviation
Television Use				
1 to 5 years	197	168	184	163
6 to 8 years	263	165	239	159
9 to 12 years	251	185	266	194
Electronic Game Use				
1 to 5 years	8	38	5	40
6 to 8 years	44	113	14	39
9 to 12 years	57	102	18	47
Computer Use				
1 to 5 years	7	28	7	35
6 to 8 years	13	43	8	28
9 to 12 years	27	71	15	43
Print Use[b]				
1 to 5 years	21	32	23	34
6 to 8 years	20	37	20	32
9 to 12 years	19	47	29	56
Highly Active Activities[c]				
1 to 5 years	42	74	34	78
6 to 8 years	107	123	62	92
9 to 12 years	137	149	63	88
Moderately Active Activities[d]				
1 to 5 years	55	81	59	92
6 to 8 years	31	65	37	69
9 to 12 years	40	73	46	89
Sedentary Activities[e]				
1 to 5 years	55	71	54	71
6 to 8 years	75	77	80	84
9 to 12 years	110	109	122	111

[a] Means represent minutes spent in each activity over a 2-day period (1 weekday and 1 weekend day).
[b] Print use represents time spent using print media including reading and being read to.
[c] Includes all sport activities such as basketball, soccer, swimming, running or bicycling.
[d] Includes activities such as singing, camping, taking music lessons, fishing, and boating.
[e] Includes activities such as playing board games, doing puzzles, talking on the phone, and relaxing.
N = Sample size.

Source: Vanderwater et al., 2004.

Table 16-99. Annual Average Time Spent (hours/day) on Various Activities According to Age, Race, Ethnicity, Marital Status, and Educational Level (ages 15 years and over)

Characteristic	Personal Care[a]	Eating and Drinking[b]	Household Activity[c]	Purchasing Goods and Services[d]	Caring for and Helping Household Member[e]	Caring for and Helping Non-Household Member[f]	Working on WorkRrelated Activity[g]	Educational Activity[h]	Organizational Civic and Religious Activity[i]	Leisure and Sport[j]	Telephone Call, Mail, and E-mail[k]	Other Activity Not Elsewhere Classified[l]
Age (years)												
15+	9.41	1.23	1.79	0.81	0.53	0.21	3.75	0.49	0.30	5.09	0.19	0.21
15 to 19	10.30	1.07	0.76	0.56	0.15	0.21	1.39	3.29	0.34	5.40	0.33	0.22
20 to 24	9.64	1.21	1.05	0.67	0.51	0.20	4.23	0.80	0.21	5.03	0.19	0.24
25 to 34	9.31	1.19	1.55	0.81	1.07	0.12	4.77	0.39	0.16	4.30	0.14	0.17
35 to 44	9.12	1.18	1.87	0.87	0.98	0.19	4.96	0.15	0.30	4.09	0.13	0.16
45 to 54	9.10	1.17	1.97	0.82	0.36	0.24	5.06	0.09	0.29	4.52	0.17	0.20
55 to 64	9.19	1.31	2.11	0.91	0.16	0.28	3.80	0.04	0.39	5.41	0.18	0.20
65 to 74	9.68	1.44	2.64	0.93	0.13	0.30	0.94	0.05	0.38	6.97	0.24	0.29
75+	9.83	1.50	2.32	0.80	0.12	0.21	0.34	0.06	0.43	7.82	0.30	0.27
Sex												
Male	9.21	1.25	1.33	0.64	0.33	0.18	4.53	0.45	0.29	5.47	0.12	0.20
Female	9.59	1.22	2.23	0.96	0.71	0.24	3.02	0.53	0.31	4.72	0.26	0.22
Race/Ethnicity												
White	9.30	1.28	1.85	0.81	0.53	0.21	3.76	0.47	0.29	5.09	0.18	0.21
Black	10.08	0.87	1.38	0.75	0.46	0.20	3.54	0.43	0.37	5.49	0.25	0.18
Hispanic/Latino	9.67	1.18	1.85	0.77	0.60	0.15	3.92	0.69	0.23	4.63	0.13	0.18
Marital Status												
Married	9.12	1.28	2.09	0.88	0.75	0.21	4.08	0.11	0.33	4.79	0.14	0.21
Other	9.75	1.18	1.43	0.72	0.25	0.22	3.34	0.94	0.27	5.45	0.25	0.20
Education												
< High School grad	9.86	1.10	2.38	0.80	0.50	0.20	2.57	0.04	0.25	6.01	0.10	0.17
HS grad, no college	9.42	1.19	2.05	0.76	0.46	0.25	3.58	0.07	0.28	5.57	0.15	0.21
Some college	9.21	1.24	1.94	0.92	0.58	0.23	4.25	0.22	0.29	4.76	0.19	0.18
BS or higher	8.94	1.41	1.77	0.91	0.71	0.18	4.72	0.22	0.37	4.33	0.22	0.23

[a] Includes sleeping, bathing, dressing, health-related self-care, and personal and private activities.
[b] Includes time spent eating or drinking (except when identified as part of work or volunteer activity); does not include time spent purchasing meals, snacks, or beverages.
[c] Includes housework, cooking, yard care, pet care, vehicle maintenance and repair, home maintenance, repair, decoration, and renovation.
[d] Includes purchase of consumer goods, professional (e.g., banking, legal, medical, real estate) and personal care services (e.g., hair salons, barbershops, day spas, tanning salons), household services (e.g., housecleaning, lawn care and landscaping, pet care, dry cleaning, vehicle maintenance, construction), and government services (e.g., applying for food stamps, government required licenses, or paying fines).
[e] Includes time spent caring or helping to care for child or adult household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up, or waiting for children).
[f] Includes time spent caring or helping to care for child or adult who is not a household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children). Does not include activities done through a volunteer organization.
[g] Includes time spent as part of the job, income-generating activities, or job search activities. Also includes travel time for work-related activities.
[h] Includes taking classes, doing research and homework, registering for classes, and before and after school extra-curricular activities, except sports.
[i] Includes time spent volunteering for or through civic obligations (e.g., jury duty, voting, attending town hall meetings), or through participating in religious or spiritual activities (e.g., church choir, youth groups, praying).
[j] Includes sports, exercise, and recreation. This category is broken down into subcategories for the 15 to 19 years old age category.
[k] Includes telephone use, mail, and e-mail. Does not include communications related to purchase of goods and services or those related to work or volunteering.
[l] Includes residual activities that could not be coded or where information was missing.

Source: DOL (2007).

Table 16-100. Annual Average Time Use by the U.S. Civilian Population, Ages 15 Years and Older

Activity	hours/day				
	Total	Male	Female	Weekday	Weekend and Holiday
Personal Care[a]	9.41	9.21	9.59	9.12	10.08
sleeping	8.63	8.56	8.69	8.33	9.32
Eating and Drinking[b]	1.23	1.25	1.22	1.18	1.37
Household Activities[c]	1.79	1.33	2.23	1.66	2.11
housework	0.61	0.25	0.95	0.57	0.70
food preparation/cleanup	0.53	0.29	0.75	0.51	0.57
lawn and garden care	0.20	0.26	0.14	0.16	0.27
household management	0.13	0.11	0.14	0.12	0.15
Purchasing Goods and Services[d]	0.81	0.64	0.96	0.76	0.93
consumer goods purchase	0.40	0.29	0.51	0.34	0.53
professional/personal goods purchase	0.09	0.06	0.11	0.10	0.04
Caring for and Helping Household Members[e]	0.53	0.33	0.71	0.56	0.45
caring for household children	0.41	0.24	0.57	0.43	0.37
Caring for and Helping Non-Household Members[f]	0.21	0.18	0.24	0.19	0.26
caring for non-household adults	0.07	0.07	0.08	0.06	0.11
Working on Work-related Activities[g]	3.75	4.53	3.02	4.77	1.36
Working	3.40	4.10	2.74	4.33	1.23
Educational Activities[h]	0.49	0.45	0.53	0.63	0.16
attending classes	0.30	0.29	0.32	0.42	0.04
homework and research	0.15	0.12	0.17	0.16	0.10
Organizational Civic and Religious Activities[i]	0.30	0.29	0.31	0.20	0.53
religious and spiritual activities	0.12	0.11	0.13	0.04	0.30
volunteering (organizational and civic activities)	0.13	0.13	0.13	0.13	0.15
Leisure and Sports[j]	5.09	5.47	4.72	4.54	6.37
socializing and communicating	0.76	0.71	0.80	0.60	1.11
watching TV	2.58	2.80	2.36	2.35	3.10
sports, exercise, recreation	0.28	0.38	0.18	0.26	0.33
Telephone Calls, Mail, and E-mail[k]	0.19	0.12	0.26	0.20	0.17
Other Activities not Elsewhere Classified[l]	0.21	0.20	0.22	0.20	0.22

[a] Includes sleeping, bathing, dressing, health-related self-care, and personal and private activities.

[b] Includes time spent eating or drinking (except when identified as part of work or volunteer activity); does not include time spent purchasing meals, snacks, or beverages.

[c] Includes housework, cooking, yard care, pet care, vehicle maintenance and repair, home maintenance, repair, decoration, and renovation.

[d] Includes purchase of consumer goods, professional (e.g., banking, legal, medical, real estate) and personal care services (e.g., hair salons, barbershops, day spas, tanning salons), household services (e.g., housecleaning, lawn care and landscaping, pet care, dry cleaning, vehicle maintenance, construction), and government services (e.g., applying for food stamps, government required licenses or paying fines).

[e] Includes time spent caring or helping to care for child or adult household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children).

[f] Includes time spent caring or helping to care for child or adult who is not a household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children). Does not include activities done through a volunteer organization.

[g] Includes time spent as part of the job, income-generating activities, or job search activities. Also includes travel time for work-related activities.

[h] Includes taking classes, doing research and homework, registering for classes, and before and after school extra-curricular activities, except sports.

[i] Includes time spent volunteering for or through civic obligations (e.g., jury duty, voting, attending town hall meetings), or through participating in religious or spiritual activities (e.g., church choir, youth groups, praying).

[j] Includes sports, exercise, and recreation. This category is broken down into subcategories for the 15 to 19 years old age category.

[k] Includes telephone use, mail and e-mail. Does not include communications related to purchase of goods and services or those related to work or volunteering.

[l] Includes residual activities that could not be coded or where information was missing.

Source: DOL (2007).

Table 16-101. Mean Time Use (hours/day) by Children, Ages 15 to 19 Years

Activity	hours/day		
	Male	Female	All
Personal Care[a]	10.26	10.34	10.30
Eating and Drinking[b]	1.02	1.11	1.07
Household Activities[c]	0.61	0.92	0.76
Purchasing Goods and Services[d]	0.38	0.74	0.56
Caring for and Helping Household Members[e]	0.10	0.19	0.15
Caring for and Helping Non-Household Members[f]	0.20	0.23	0.21
Working on Work-related Activities[g]	1.53	1.24	1.39
Educational Activities[h]	3.08	3.51	3.29
Organizational Civic and Religious Activities[i]	0.34	0.33	0.34
Leisure and Sports[j]	6.02	4.75	5.40
total leisure and sports – weekdays	-	-	4.85
total leisure and sports – weekends	-	-	6.68
sports, exercise, recreation – weekdays	-	-	0.58
sports, exercise, recreation – weekends/holidays	-	-	0.69
socializing and communicating – weekdays	-	-	0.76
socializing and communicating, – weekends/holidays	-	-	1.32
watching TV – weekdays	-	-	1.96
watching TV – weekends/holidays	-	-	2.45
reading – weekdays	-	-	0.11
reading – weekends/holidays	-	-	0.11
relaxing, thinking – weekdays	-	-	0.15
relaxing, thinking – weekends/holidays	-	-	0.13
playing games, computer use for leisure – weekdays	-	-	0.69
playing games, computer use for leisure – weekends/holidays	-	-	1.00
other sports/leisure including travel – weekdays	-	-	0.61
other sports/leisure including travel – weekends/holidays	-	-	0.98
Telephone Calls, Mail, and E-mail[k]	0.24	0.42	0.33
Other Activities not Elsewhere Classified[l]	0.23	0.21	0.22

[a] Includes sleeping, bathing, dressing, health-related self-care, and personal and private activities.

[b] Includes time spent eating or drinking (except when identified as part of work or volunteer activity); does not include time spent purchasing meals, snacks, or beverages.

[c] Includes housework, cooking, yard care, pet care, vehicle maintenance and repair, home maintenance, repair, decoration, and renovation.

[d] Includes purchase of consumer goods, professional (e.g., banking, legal, medical, real estate) and personal care services (e.g., hair salons, barbershops, day spas, tanning salons), household services (e.g., housecleaning, lawn care and landscaping, pet care, dry cleaning, vehicle maintenance, construction), and government services (e.g., applying for food stamps, government required licenses or paying fines).

[e] Includes time spent caring or helping to care for child or adult household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children).

[f] Includes time spent caring or helping to care for child or adult who is not a household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children). Does not include activities done through a volunteer organization.

[g] Includes time spent as part of the job, income-generating activities, or job search activities. Also includes travel time for work-related activities.

[h] Includes taking classes, doing research and homework, registering for classes, and before and after school extra-curricular activities, except sports.

[i] Includes time spent volunteering for or through civic obligations (e.g., jury duty, voting, attending town hall meetings), or through participating in religious or spiritual activities (e.g., church choir, youth groups, praying).

[j] Includes sports, exercise, and recreation. This category is broken down into subcategories for the 15 to 19 years old age category.

[k] Includes telephone use, mail and e-mail. Does not include communications related to purchase of goods and services or those related to work or volunteering.

[l] Includes residual activities that could not be coded or where information was missing.

Source: DOL (2007).

Table 16-102. Mean Time Spent (minutes/day) in Moderate to Vigorous Physical Activity (children only)

Age (years)	Number of Participants		Weekday Mean (SD)			Weekend Mean (SD)		
	Boys	Girls	Boys	Girls	Both	Boys	Girls	Both
9	555	543	190.8(53.2)	173.3(46.6)	181.8(50.6)	184.3(68.6)	173.3(64.3)	178.6(66.6)
11	544	540	133.0(42.9)	115.6(36.3)	124.1(40.6)	127.1(59.5)	112.6(53.2)	119.7(56.8)
12	532	532	105.3(40.2)	86.0(32.5)	95.6(37.8)	93.4(55.3)	73.9(45.8)	83.6(51.7)
15	503	506	58.2(31.8)	38.7(23.6)	49.2(29.9)	43.2(38.0)	25.5(23.3)	35.1(33.3)

SD = Standard deviation.

Source: Nader et al. (2008).

Table 16-103. Occupational Tenure of Employed Individuals[a] by Age and Sex

Age Group (years)	Median Tenure (years)					
	N	All Workers	*N*	Men	*N*	Women
16 to 24	19,090	1.9	9,520	2.0	9,270	1.9
25 to 29	16,326	4.4	8,974	4.6	7,353	4.1
30 to 34	15,833	6.9	8,971	7.6	6,863	6.0
35 to 39	14,674	9.0	8,109	10.4	6,565	7.0
40 to 44	11,871	10.7	6,463	13.8	5,408	8.0
45 to 49	9,350	13.3	5,208	17.5	4,152	10.0
50 to 54	7,684	15.2	4,341	20.0	3,343	10.8
55 to 59	6,914	17.7	4,006	21.9	2,908	12.4
60 to 64	4,500	19.4	2,673	23.9	1,827	14.5
65 to 69	1,692	20.1	1,000	26.9	692	15.6
70 and older	1,146	21.9	678	30.5	467	18.8
Total	109,090	6.6	60,242	7.9	41,949	5.4

[a] Working population = 109.1 million persons.

N = Number of individuals.

Source: Carey (1988).

Table 16-104. Occupational Tenure for Employed Individuals[a] Grouped by Sex and Race

	Median Tenure (years)					
		All Individuals				
Race	*N*		*N*	Men	*N*	Women
White	95,044	6.7	53,096	8.3	41,949	5.4
Black	10,851	5.8	5,447	5.8	5,404	5.8
Hispanic	7,198	4.5	4,408	5.1	2,790	3.7

[a] Working population = 109.1 million persons.
N = Number of individuals.

Source: Carey (1988).

Table 16-105. Occupational Tenure for Employed Individuals[a] Grouped by Sex and Employment Status

	Median Tenure (years)					
Employment Status	*N*	All Individuals	*N*	Men	*N*	Women
Full-Time	93,665	7.2	55,464	8.4	38,201	5.9
Part-Time	15,425	3.1	4,778	2.4	10,647	3.6

[a] Working population = 109.1 million persons.
N = Number of individuals.

Source: Carey (1988).

Table 16-106. Occupational Tenure of Employed Individuals[a] Grouped by Major Occupational Groups and Age

		Median Tenure (years)					
		Age Group (years)					
Occupational Group	Total[b]	16–24	25–34	35–44	45–54	55–64	65+
Executive, Administrative, and Managerial	8.4	2.4	5.6	10.1	15.1	17.9	26.3
Professional Specialty	9.6	2.0	5.7	12.0	18.2	25.6	36.2
Technicians and Related Support	6.9	2.2	5.7	10.9	17.7	20.8	22.2
Sales Occupations	5.1	1.7	4.7	7.7	10.5	15.5	21.6
Administrative Support, including Clerical	5.4	2.1	5.0	7.6	10.9	14.6	15.4
Service Occupations	4.1	1.7	4.4	6.9	9.0	10.6	10.4
Precision Production, Craft, and Repair	9.3	2.6	7.1	13.5	19.9	25.7	30.1
Operators, Fabricators, and Laborers	5.5	1.7	4.6	9.1	13.7	18.1	14.7
Farming, Forestry, and Fishing	10.4	2.9	7.9	13.5	20.7	30.5	39.8

[a] Working population = 109.1 million persons.
[b] Includes all workers 16 years and older.

Source: Carey (1988).

Table 16-107. Voluntary Occupational Mobility Rates for Workers[a] Age 16 Years and Older

Age Group (years)	Occupational Mobility Rate[b] (percent)
16 to 24	12.7
25 to 34	6.6
35 to 44	4.0
45 to 54	1.9
55 to 64	1.0
64 and older	0.3
Total, age 16 and older	5.3

[a] Working population = 100.1 million persons.

[b] Occupational mobility rate = percentage of persons employed in an occupation who had voluntarily entered it from another occupation.

Source: Carey (1990).

Table 16-108. Descriptive Statistics for Residential Occupancy Period (years)

			Percentiles													
	N	Mean	5th	10th	25th	50th	75th	90th	95th	98th	99th	99.5th	99.8th	99.9th	2nd Largest Value	Max.
Both sexes	500,000	11.7	2	2	3	9	16	26	33	41	47	51	55	59	75	87
Male only	244,274	11.1	2	2	4	8	15	24	31	39	44	48	53	56	73	73
Female only	255,726	12.3	2	2	5	9	17	28	35	43	49	53	58	61	75	87

N = Number of simulated persons.

Source: Johnson and Capel (1992).

Table 16-109. Descriptive Statistics for Both Sexes by Current Age

Current Age, Years	Residential Ooccupancy Period (years)						
		Percentiles					
	Mean	25	50	75	90	95	99
3	6.5	3	5	8	13	17	22
6	8.0	4	7	10	15	18	22
9	8.9	5	8	12	16	18	22
12	9.3	5	9	13	16	18	23
15	9.1	5	8	12	16	18	23
18	8.2	4	7	11	16	19	23
21	6.0	2	4	8	13	17	23
24	5.2	2	4	6	11	15	25
27	6.0	3	5	8	12	16	27
30	7.3	3	6	9	14	19	32
33	8.7	4	7	11	17	23	39
36	10.4	5	8	13	21	28	47
39	12.0	5	9	15	24	31	48
42	13.5	6	11	18	27	35	49
45	15.3	7	13	20	31	38	52
48	16.6	8	14	22	32	39	52
51	17.4	9	15	24	33	39	50
54	18.3	9	16	25	34	40	50
57	19.1	10	17	26	35	41	51
60	19.7	11	18	27	35	40	51
63	20.2	11	19	27	36	41	51
66	20.7	12	20	28	36	41	50
69	21.2	12	20	29	37	42	50
72	21.6	13	20	29	37	43	53
75	21.5	13	20	29	38	43	53
78	21.4	12	19	29	38	44	53
81	21.2	11	20	29	39	45	55
84	20.3	11	19	28	37	44	56
87	20.6	10	18	29	39	46	57
90	18.9	8	15	27	40	47	56
All ages	11.7	4	9	16	26	33	47

Source: Johnson and Capel (1992).

Table 16-110. Residence Time of Owner/Renter Occupied Units

Year Household Moved Into Unit	Total Occupied Units (number in thousands)
2005–2009	33,543
2000–2004	28,695
1995–1999	15,120
1990–1994	9,631
1985–1989	6,459
1980–1984	3,703
1975–1979	4,412
1970–1974	2,979
1960–1969	3,661
1950–1959	1,892
1940–1949	460
1939 or earlier	137
Total	110,692

Source: U.S. Census Bureau (2008a).

Table 16-111. Percent of Householders Living in Houses for Specified Ranges of Time, and Statistics for Years Lived in Current Home

Years Lived in Current Home	Percent of Total Households
0–4	30.3
5–9	25.9
10–14	13.7
15–19	8.7
20–24	5.8
25–29	3.3
30–34	4.0
35–44	2.7
45–54	3.3
55–64	1.7
65–74	0.4
>75	0.1
Total[a]	99.9

Statistics for Years Lived in Current Home

N	Mean[b]	50th Percentile[b]	90th Percentile[b]	95th Percentile[b]	99th Percentile[b]
110,692	13	8	32	46	62

[a] Total does not equal 100 due to rounding errors.

[b] The mean, 50th and 90th percentiles were calculated for the number of years lived in current house by apportioning the total sample size (110,692 households) to the indicated percentile associated with the applicable range of years lived in the current home, assuming an even distribution.

Source: Adapted from U.S. Census Bureau (2008a).

Table 16-112. Values and Their Standard Errors for Average Total Residence Time, *T*, for Each Group in Survey[a]

Households	Average Total Residence Time *T* (years)	SD S_T	Average Current Residence T_{CR} (years)	Households (percent)	
				1985	1987
All households	4.55 ± 0.60	8.68	10.56 ± 0.10	100.0	100.0
Renters	2.35 ± 0.14	4.02	4.62 ± 0.08	36.5	36.0
Owners	11.36 ± 3.87	13.72	13.96 ± 0.12	63.5	64.0
Farms	17.31 ± 13.81	18.69	18.75 ± 0.38	2.1	1.9
Urban	4.19 ± 0.53	8.17	10.07 ± 0.10	74.9	74.5
Rural	7.80 ± 1.17	11.28	12.06 ± 0.23	25.1	25.5
Northeast region	7.37 ± 0.88	11.48	12.64 ± 0.12	21.2	20.9
Midwest region	5.11 ± 0.68	9.37	11.15 ± 0.10	25.0	24.5
South region	3.96 ± 0.47	8.03	10.12 ± 0.08	34.0	34.4
West region	3.49 ± 0.57	6.84	8.44 ± 0.11	19.8	20.2

[a] Values of the average current residence time, T_{CR}, are given for comparison.

Source: Israeli and Nelson (1992).

Table 16-113. Total Residence Time, *T* (years), Corresponding to Selected Values of *R(t)*[a] by Housing Category

R(t) =	0.05	0.1	0.25	0.5	0.75
All households	23.1	12.9	3.7	1.4	0.5
Renters	8.0	5.2	2.6	1.2	0.5
Owners	41.4	32.0	17.1	5.2	1.4
Farms	58.4	48.3	26.7	10.0	2.4
Urban	21.7	10.9	3.4	1.4	0.5
Rural	32.3	21.7	9.1	3.3	1.2
Northeast region	34.4	22.3	7.5	2.8	1.0
Midwest region	25.7	15.0	4.3	1.6	0.6
South region	20.7	10.8	3.0	1.2	0.4
West region	17.1	8.9	2.9	1.2	0.4

[a] *R(t)* = fraction of households living in the same residence for *T* years or more.

Source: Israeli and Nelson (1992).

Table 16-114. Summary of Residence Time of Recent Home Buyers (1993)

Number of Years Lived in Previous House	Percent of Respondents
1 year or less	2
2–3	16
4–7	40
8–9	10
10 years or more	32

Source: NAR (1993).

Table 16-115. Tenure in Previous Home (percentage distribution)

	1987	1989	1991	1993
	Percent			
1 year or less	5	8	4	2
2–3 Years	25	15	21	16
4–7 Years	36	22	37	40
8–9 Years	10	11	9	10
10 or More Years	24	34	29	32
Total	100	100	100	100
	Years			
Median	6	6	6	6

Source: NAR (1993).

Table 16-116. Number of Miles Moved (percentage distribution)

Mile	All Buyers	First-Time Buyer	Repeat Buyer	New Home Buyer	Existing Home Buyer
	Percent				
Less than 5 miles	29	33	27	23	31
5–9 miles	20	25	16	18	20
10–19 miles	18	20	17	20	17
20–34 miles	9	11	8	12	9
35–50 miles	2	2	2	2	3
51–100 miles	5	2	6	6	4
Over 100 miles	17	6	24	19	16
Total	100	100	100	100	100
	Miles				
Median	9	8	11	11	8
Mean	200	110	270	230	190

Source: NAR (1993).

Table 16-117. General Mobility, by Race and Hispanic Origin, Region, Sex, Age, Educational Attainment, Marital Status, Nativity, Tenure, and Poverty Level: 2006−2007 (numbers in thousands)

	Total	Mover		Same County		Different County, Same State		Different State, Same Division		Different Division, Same Region		Different Region		Abroad	
Population	*N*	*N*	% (of total)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)
Total 1+ years	292,749	38,681	13%	25,192	65%	7,436	19%	1,446	4%	968	3%	2,448	6%	1,191	3%
Sex															
Male	143,589	19,457	14%	12,579	65%	3,693	19%	771	4%	505	3%	1,220	6%	689	4%
Female	149,160	19,224	13%	12,613	66%	3,743	19%	675	4%	463	2%	1,228	6%	502	3%
Age (years)															
1 to 4 years	16,455	3,217	20%	2,188	68%	577	18%	117	4%	81	3%	184	6%	72	2%
5 to 9 years	19,830	3,161	16%	2,092	66%	614	19%	121	4%	73	2%	179	6%	81	3%
10 to 14 years	20,444	2,517	12%	1,735	69%	441	18%	92	4%	62	2%	139	6%	47	2%
15 to 17 years	13,297	1,465	11%	1,057	72%	224	15%	50	3%	22	2%	75	5%	37	3%
18 to 19 years	7,873	1,330	17%	898	68%	252	19%	40	3%	25	2%	68	5%	47	4%
20 to 24 years	20,532	5,516	27%	3,623	66%	1,069	19%	168	3%	157	3%	320	6%	179	3%
25 to 29 years	20,666	5,316	26%	3,335	63%	1,061	20%	219	4%	136	3%	339	6%	226	4%
30 to 34 years	19,202	3,767	20%	2,374	63%	789	21%	140	4%	106	3%	221	6%	137	4%
35 to 39 years	20,907	2,962	14%	1,877	63%	587	20%	104	4%	84	3%	187	6%	121	4%
40 to 44 years	21,856	2,456	11%	1,567	64%	480	20%	102	4%	60	2%	178	7%	68	3%
45 to 49 years	22,643	1,963	9%	1,362	69%	304	15%	74	4%	42	2%	131	7%	49	2%
50 to 54 years	20,819	1,612	8%	1,119	69%	292	18%	55	3%	42	3%	76	5%	27	2%
55 to 59 years	18,221	1,171	6%	706	60%	258	22%	57	5%	37	3%	86	7%	27	2%
60 to 61 years	6,093	381	6%	212	56%	82	22%	30	8%	9	2%	39	10%	10	3%
62 to 64 years	7,877	386	5%	201	52%	98	25%	19	5%	1	0%	49	13%	18	5%
65 to 69 years	10,629	496	5%	286	58%	110	22%	16	3%	5	1%	63	13%	16	3%
70 to 74 years	8,369	357	4%	179	50%	79	22%	24	7%	17	5%	43	12%	15	4%
75 to 79 years	7,567	233	3%	153	66%	41	18%	4	2%	6	3%	21	9%	7	3%
80 to 84 years	5,513	219	4%	121	55%	53	24%	10	5%	4	2%	26	12%	5	2%
85+ years	3,958	159	4%	108	68%	24	15%	2	1%	-	-	22	14%	3	2%
Educational Attainment															
Not a high school graduate	27,742	3,458	12%	2,431	70%	575	17%	103	3%	33	1%	137	4%	178	5%
High school graduate	61,490	6,435	10%	4,398	68%	1,207	19%	221	3%	145	2%	353	5%	112	2%
Some college or AA degree	49,243	5,534	11%	3,475	63%	1,167	21%	206	4%	145	3%	411	7%	130	2%
Bachelor's degree	36,658	4,062	11%	2,290	56%	910	22%	231	6%	124	3%	336	8%	172	4%
Prof or graduate degree	19,184	1,985	10%	1,004	51%	399	20%	97	5%	102	5%	246	12%	137	7%
Persons age 1 to 24	98,431	17,205	17%	11,593	67%	3,177	18%	589	3%	419	2%	965	6%	462	3%

Table 16-117. General Mobility, by Race and Hispanic Origin, Region, Sex, Age, Educational Attainment, Marital Status, Nativity, Tenure, and Poverty Level: 2006−2007 (numbers in thousands) (continued)

	Total	Mover		Same County		Different County, Same State		Different State, Same Division		Different Division, Same Region		Different Region		Abroad	
Population	*N*	*N*	% (of total)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)	*N*	% (of movers)
Marital Status															
Married, spouse present	121,390	10,671	9%	6,434	60%	2,220	21%	502	5%	338	3%	808	8%	369	3%
Married, spouse absent	3,472	805	23%	501	62%	90	11%	31	4%	11	1%	73	9%	98	12%
Widowed	13,920	802	6%	533	66%	136	17%	34	4%	8	1%	68	8%	22	3%
Divorced	22,867	3,483	15%	2,369	68%	702	20%	93	3%	69	2%	200	6%	50	1%
Separated	5,047	1,246	25%	911	73%	213	17%	29	2%	16	1%	57	5%	19	2%
Never married	69,324	12,779	18%	8,429	66%	2,442	19%	427	3%	310	2%	739	6%	433	3%
Persons age 1 to 14	56,730	8,895	16%	6,015	68%	1,632	18%	330	4%	216	2%	502	6%	200	2%
Nativity															
Native	255,501	33,023	13%	21,603	65%	6,671	20%	1,279	4%	904	3%	2,180	7%	387	1%
Foreign born	37,248	5,658	15%	3,589	63%	765	14%	167	3%	64	1%	268	5%	804	14%
Naturalized US citizen	14,525	1,161	8%	768	66%	212	18%	41	4%	31	3%	76	7%	31	3%
Not a US citizen	22,723	4,497	20%	2,821	63%	553	12%	126	3%	33	1%	192	4%	772	17%
Tenure															
Owner-occupied housing unit	207,774	13,760	7%	8,467	62%	2,881	21%	595	4%	408	3%	1,027	7%	381	3%
Renter-occupied housing unit	81,351	24,228	30%	16,353	67%	4,374	18%	806	3%	547	2%	1,371	6%	776	3%
No cash renter-occupied housing unit	3,624	694	19%	372	54%	181	26%	45	6%	13	2%	49	7%	33	5%
Poverty Status															
Below 100% of poverty	35,924	8,777	24%	6,041	69%	1,484	17%	270	3%	166	2%	392	4%	423	5%
100% to 149% of poverty	26,183	4,705	18%	3,312	70%	832	18%	128	3%	84	2%	215	5%	136	3%
150% of poverty and above	230,642	25,199	11%	15,839	63%	5,120	20%	1,048	4%	718	3%	1,841	7%	632	3%

\- Represents 0 or rounds to 0.
N = Number of respondents.

Source: U.S. Census Bureau (2008b).

Table 16-118. Distance of Intercounty Move[a], by Sex, Age, Race and Hispanic Origin, Educational Attainment, Marital Status, Nativity, Tenure, Poverty Status, Reason for Move, and State of Residence 1 Year Ago: 2006 to 2007 (numbers in thousands)

	Total	Less than 50 miles		50 to 199 miles		200 to 499 miles		500 miles or more	
Population	*N*	*N*	%	*N*	%	*N*	%	*N*	%
Intercounty Movers 1+ years	12,299	5,149	42%	2,582	21%	1,802	15%	2,765	22%
Sex									
Male	6,190	2,554	41%	1,324	21%	894	14%	1,418	23%
Female	6,109	2,595	42%	1,258	21%	909	15%	1,347	22%
Age									
Under 16 years	2,809	1,230	44%	520	19%	455	16%	603	21%
16 to 19 years	629	279	44%	148	24%	82	13%	120	19%
20 to 24 years	1,714	720	42%	436	25%	185	11%	373	22%
25 to 29 years	1,755	792	45%	347	20%	215	12%	400	23%
30 to 44 years	3,040	1,295	43%	618	20%	458	15%	669	22%
45 to 64 years	1,782	633	36%	408	23%	312	18%	429	24%
65 to 74 years	357	128	36%	68	19%	66	18%	95	27%
75+ years	213	71	33%	37	17%	30	14%	76	36%
Race and Hispanic Origin									
White alone	9,730	4,049	42%	2,064	21%	1,382	14%	2,234	23%
Black or African American alone	1,626	729	45%	285	18%	320	20%	293	18%
Asian alone	515	205	40%	120	23%	51	10%	138	27%
All remaining single races and all race combinations[b]	427	166	39%	113	26%	49	11%	99	23%
White alone, not Hispanic or Latino	8,290	3,527	43%	1,697	20%	1,156	14%	1,910	23%
Hispanic or Latino[c]	1,575	578	37%	401	25%	232	15%	364	23%
White alone or in combination with 1 or more other races	9,986	4,161	42%	2,130	21%	1,405	14%	2,290	23%
Black or African American alone or in combination with 1 or more other races	1,733	777	45%	312	18%	329	19%	315	18%
Asian alone or in combination with 1 or more other races	573	223	39%	146	25%	59	10%	144	25%

Table 16-118. Distance of Intercounty Move[a], by Sex, Age, Race and Hispanic Origin, Educational Attainment, Marital Status, Nativity, Tenure, Poverty Status, Reason for Move, and State of Residence 1 Year Ago: 2006 to 2007 (numbers in thousands) (continued)

	Total	Less than 50 miles		50 to 199 miles		200 to 499 miles		500 miles or more	
Population	*N*	*N*	%	*N*	%	*N*	%	*N*	%
Educational Attainment									
Not a high school graduate	848	390	46%	197	23%	126	15%	135	16%
High school graduate	1,926	776	40%	414	21%	351	18%	385	20%
Some college or AA degree	1,929	836	43%	376	19%	254	13%	463	24%
Bachelor's degree	1,601	651	41%	340	21%	210	13%	400	25%
Prof. or graduate degree	844	268	32%	151	18%	140	17%	286	34%
Persons age 1 to 24	5,151	2,229	43%	1,104	21%	721	14%	1,096	21%
Marital Status									
Married, spouse present	3,868	1,500	39%	834	22%	560	14%	975	25%
Married, spouse absent	206	57	28%	44	21%	31	15%	74	36%
Widowed	246	78	32%	60	24%	45	18%	63	26%
Divorced	1,065	493	46%	221	21%	158	15%	193	18%
Separated	316	146	46%	57	18%	66	21%	47	15%
Never married	3,917	1,691	43%	867	22%	517	13%	843	22%
Persons age 1 to 14	2,680	1,184	44%	500	19%	426	16%	570	21%
Nativity									
Native	11,034	4,627	42%	2,299	21%	1,646	15%	2,462	22%
Foreign born	1,265	523	41%	283	22%	156	12%	303	24%
Naturalized U.S. citizen	361	156	43%	63	17%	45	12%	96	27%
Not a US citizen	904	367	41%	220	24%	111	12%	206	23%
Tenure									
Owner-occupied housing unit	4,912	2,083	42%	950	19%	742	15%	1,137	23%
Renter-occupied housing unit	7,099	2,962	42%	1,554	22%	1,019	14%	1,564	22%
No cash renter-occupied housing unit	288	104	36%	78	27%	41	14%	64	22%
Poverty Status									
Below 100% of poverty	2,313	967	42%	576	25%	353	15%	417	18%
100% to 149% of poverty	1,258	625	50%	245	19%	176	14%	212	17%
150% of poverty and above	8,728	3,558	41%	1,761	20%	1,274	15%	2,136	24%

Table 16-118. Distance of Intercounty Move[a], by Sex, Age, Race and Hispanic Origin, Educational Attainment, Marital Status, Nativity, Tenure, Poverty Status, Reason for Move, and State of Residence 1 Year Ago: 2006 to 2007 (continued)
(numbers in thousands)

	Total	Less than 50 miles		50 to 199 miles		200 to 499 miles		500 miles or more	
Population	*N*	*N*	%	*N*	%	*N*	*N*	%	*N*
State of Residence 1 Year Ago									
Same state	7,436	4,741	64%	2,059	28%	627	8%	9	0%
Different state	4,862	408	8%	524	11%	1,175	24%	2,756	57%

[a] The estimated distance in miles of an intercounty move is measured from the county of previous residence's geographic population centroid to the county of current residence's geographic population centroid.
[b] Includes American Indian and Alaska Native alone, Native Hawaiian and Other Pacific Islander alone, and 2 or More Races.
[c] Hispanics or Latinos may be of any race.

Source: U.S. Census Bureau (2008b).

17. CONSUMER PRODUCTS

17.1. INTRODUCTION

17.1.1. Background

Consumer products may contain toxic or potentially toxic chemical constituents to which people may be exposed as a result of their use. For example, household cleaners can contain ammonia, alcohols, acids, and/or organic solvents that may pose health concerns. Potential routes of exposure to consumer products or chemicals released from consumer products during use include ingestion, inhalation, and dermal contact. These household consumer products include cleaners, solvents, and paints. Non-users, including children, can be passively exposed to chemicals in these products. Because people spend a large amount of time indoors, the use of household chemicals in the indoor environment can be a principal source of exposure (Franklin, 2008).

Very little information is available about the exact way the different kinds of products are used by consumers, including the many ways in which these products are handled, the frequency and duration of contact, and the measures consumers may take to minimize exposure or risk (Steenbekkers, 2001). In addition, the factors that influence these behaviors are not well studied, but some studies have shown that a large variation exists in behavior between persons (Steenbekkers, 2001).

This chapter presents information on the amount of product used, the frequency of use, and the duration of use for various consumer products typically found in consumer households. All tables that present information for these consumer products are located at the end of this chapter.

Note that this chapter does not provide an exhaustive treatment of all consumer products, but rather, it provides some background and data that can be used in an exposure assessment. Also, the data presented may not capture the information needed to assess the highly exposed population (i.e., consumers who use commercial and industrial strength products at home). The studies presented in the following sections represent readily available surveys for which data were collected on the frequency and duration of use and the amount of use of cleaning products, painting products, household solvent products, cosmetic and other personal care products, household equipment, pesticides, and tobacco. Also note that some of the data in this chapter comes from corporate, consortia, or trade organizations.

17.1.2. Additional Sources of Information

There are several sources of information on data relevant to consumer products. Table 17-1 provides a list of household consumer products found in some U.S. households (U.S. EPA, 1987). It should be noted, however, that this list was compiled by the U.S. Environmental Protection Agency (EPA) in 1987, and consumer use of some products listed may have changed (e.g., aerosol product use has declined). Therefore, refer to the Household Product Database of the National Library of Medicine database as a source of more current information on the types of products used. This database contains over 7,000 consumer brands including auto products; products used inside the home; pesticides; landscape and yard; personal care; home maintenance, arts, and crafts; pet care; and home office. The information includes chemical ingredients, specific brands that contain those ingredients, and acute and chronic health effects associated with specific ingredients. The database does not contain any information on frequency or amount of product used.

The Soaps and Detergent Association (SDA) developed a peer-reviewed document that presents methodologies and specific exposure information that can be used for screening-level risk assessments from exposures to high production volume chemicals. The document addresses the use of consumer products, including laundry, cleaning, and personal care products. It includes data for daily frequency of use and the amount of product used. The data used were compiled from a number of sources including cosmetic associations and data from the SDA. The document *Exposure and Risk Screening Methods for Consumer Product Ingredients* can be found on the SDA Web site at http://www.cleaning101.com/files/Exposure_and_Risk_Screening_Methods_for_Consumer_Product_Ingredients.pdf.

Another document has been developed by the U.S. EPA Office of Toxic Substances (1986a, b): *Standard Scenarios for Estimating Exposure to Chemical Substances During Use of Consumer Products – Volumes I and II*. This document presents data and supporting information required to assess consumer exposure to constituents in household cleaners and components of adhesives. Its information includes a description of standard scenarios selected to represent upper bound exposures for each product. Values also are presented for parameters needed to estimate exposure for defined exposure routes and pathways assumed for each scenario.

An additional reference is the Simmons Market Research Bureau's (SMRB's) *Simmons Study of*

Media and Markets. This document provides an example of available marketing data that may be useful in assessing exposure to selected products. The report is published biannually. Data are collected on the buying habits of the U.S. population during the previous 12 months for more than 1,000 consumer products. Data are presented on frequency of use, total number of buyers in each use category, and selected demographics. The consumer product data are presented according to the buyer and not necessarily according to the user (i.e., actively exposed person). Therefore, it may be necessary to adjust the data to reflect potential uses. The reports are available for purchase from the SMRB. Table 17-2 presents a list of product categories in the *Simmons Study of Media and Markets* for which information is available.

17.2. RECOMMENDATIONS

Because of the large range and variation among consumer products and their exposure pathways, it is not feasible to recommend specific exposure values as has been done in other chapters of this handbook. Refer to the information provided by the references of this chapter to derive appropriate exposure factors. The following sections of this chapter provide summaries of data from surveys involving the use of consumer products.

17.3. CONSUMER PRODUCTS USE STUDIES

17.3.1. CTFA (1983)—Cosmetic, Toiletry, and Fragrance Association, Inc.—Summary of Results of Surveys of the Amount and Frequency of Use of Cosmetic Products by Women

The Cosmetic, Toiletry, and Fragrance Association, Inc. (CTFA, 1983), a major manufacturer and a market research bureau, published three surveys that collected data on the frequency of use of various cosmetic products and selected baby products. In the first survey, CTFA (1983) conducted a 1-week prospective survey of 47 female employees and relatives of employees between ages 13 and 61 years. In the second survey, a cosmetic manufacturer conducted a retrospective survey of 1,129 of its customers. In the third survey, a market research bureau sampled 19,035 female consumers nationwide over a 9½-month period. Of the 19,035 females interviewed, responses from only 9,684 females were tabulated (CTFA, 1983). The respondents in all three surveys were asked to record the number of times they used the various products in a given time period (i.e., a week, a day, a month, or a year). The third survey also was designed to reflect the socio-demographic (e.g., age, income) characteristics of the entire U.S. population.

To obtain the average frequency of use for each cosmetic product, responses were averaged for each product in each survey. Averages were calculated by adding the reported number of uses per given time period for each product, dividing by the total number of respondents in the survey, and then dividing again by the number of days in the given time period (CTFA, 1983). The average frequency of use of cosmetic products was determined for both users and non-users. The frequency of use of baby products was determined among users only. The upper 90^{th} percentile frequency of use values were determined by eliminating the top 10% most extreme frequencies of use. Therefore, the highest remaining frequency of use was recorded as the upper 90^{th} percentile value. Table 17-3 presents the amount of product used per application (grams) and the average and 90^{th} percentile frequency of use per day for various cosmetic products for all the surveys. Note that Table 17-3 reports values provided by cosmetic companies, associations, or market research firms.

An advantage of the frequency data obtained from the third survey (by the market research bureau) is that the sample population was more likely to be representative of the U.S. population. Another advantage of the third data set is that the survey was conducted over a longer period of time when compared with the other two frequency datasets. Also, the study provided empirical data that may be useful in generating more accurate estimates of consumer exposure to cosmetic products. In contrast to the large market research bureau survey, the CTFA employee survey is very small, and both that survey and the cosmetic company survey are likely to be biased toward high-end users. Therefore, data from these two surveys should be used with caution. The limitations of these surveys are that data were not tabulated by age, are more than 20 years old, and are only representative of products used by babies and female consumers. Another limitation is that these data may not be representative of long-term use patterns.

17.3.2. Westat (1987a)—Household Solvent Products: A National Usage Survey

Westat (1987a) conducted a nationwide survey to determine consumer exposure to common household products believed to contain methylene chloride or its substitutes (i.e., carbon tetrachloride, trichloroethane, trichloroethylene, perchloroethylene, and 1,1,1,2,2,2 -

trichlorotrifluoroethane). The survey methodology was comprised of two phases. In the first phase, the sample population was generated by using a random digit dialing (RDD) procedure, in which telephone numbers of households nationwide were randomly selected by using an unbiased, equal probability of selection method, known as the Waksberg Method (Westat, 1987a). After the respondents in the selected households (18 years and older) agreed to participate in the survey, questionnaires and product pictures were mailed to each respondent. Finally, telephone follow-up calls were made to those respondents who did not respond to the mailed questionnaire within a 4-week period to administer the same questionnaire. Of the 6,700 individuals contacted for the survey, 4,920 individuals either responded to the mailed questionnaire or to a telephone interview (a response rate of 73%). Survey questions included how often the products were used in the last 12 months, when they were last used, how much time was spent using a product (per occasion or year), how long the respondent remained in the room after use, how much of a product was used per occasion or year, and what protective measures were used (Westat, 1987a).

Thirty-two categories of common household products were included in the survey and are presented in Table 17-4. Table 17-4, Table 17-5, Table 17-6, and Table 17-7 provide means, medians, and percentile rankings for the following variables: frequency of use, exposure time, amount of use, and time exposed after use.

An advantage of this study is that the RDD procedure (i.e., Waksberg Method) to identify participants enabled a diverse selection of a representative, unbiased sample of the U.S. population (Westat, 1987a). Also, empirical data on consumer household product use are provided. However, a limitation associated with this study is that the data generated were based on recall behavior. Another limitation is that extrapolation of these data to long-term use patterns may be difficult; the data are more than 20 years old and cannot be broken out by age groups.

17.3.3. Westat (1987c)—National Usage Survey of Household Cleaning Products

Westat (1987c) collected usage data from a nationwide survey to assess the magnitude of exposure of consumers to various products used when performing certain household cleaning tasks. The survey was conducted from the middle of November 1985 to the middle of January 1986. Telephone interviews were conducted with 193 households. According to Westat (1987c), the resulting response rate for this survey was 78%. The Waksberg Method discussed in the Westat (1987a) study also was used in randomly selecting telephone numbers employed in this survey. The survey was designed to obtain information on cleaning activities performed in the interior of the home during the previous year. The person who did the majority of the cleaning in the kitchen and bathroom areas of each household was interviewed. Of those respondents, the primary cleaner was female in 160 households (83%) and male in 30 households (16%); the sex of the respondents in the three remaining households was not ascertained (Westat, 1987c). Data obtained from the survey included the frequency of performing 14 different cleaning tasks, the amount of time (duration) spent at each task, the cleaning product most frequently used, the type of product (i.e., liquid, powder, aerosol, or spray pump) used, and the protective measures taken during cleaning, such as wearing rubber gloves or having a window open or an exhaust fan on (Westat, 1987c).

Table 17-8 through Table 7-12 present the survey data. Table 17-8 presents the mean and median total exposure time of use for each cleaning task and the product type preferred for each task. Table 17-9 presents the percentile rankings for the total time exposed to the products used for 14 cleaning tasks. Table 17-10 presents the mean and percentile rankings of the frequency in performing each task. Table 17-11 shows the mean and percentile rankings for exposure time per event of performing household tasks. Table 17-12 presents the mean and percentile rankings for total number of hours spent per year using the top 10 product groups.

Westat (1987c) randomly selected a subset of 30 respondents from the original survey and re-interviewed them during the first 2 weeks of March 1986 as a reliability check on the recall data from the original phone survey. Frequency and duration data for 3 of the original 14 cleaning tasks were obtained from the re-interviews. In a second effort to validate the phone survey, 50 respondents of the original phone survey participated in a 4-week diary study (between February and March 1986) of 8 of the 14 cleaning tasks originally studied. The diary approach assessed the validity of using a 1-time telephone survey to determine usual cleaning behavior (Westat, 1987c). The data (i.e., frequency and duration) obtained from the re-interviews and the diary approach were lower than the data from the original telephone survey, but were more consistent with one other. Westat (1987c) attributed the significant differences in the data obtained from these surveys to seasonal changes rather than methodological problems.

A limitation of this survey is evident from the reliability and validity check of the data collected by Westat (1987c). The data obtained from the telephone survey may reflect heavier seasonal cleaning because the survey was conducted during the holidays (November through January). Therefore, usage data obtained in this study may be biased and may represent upper bound estimates. Other limitations of this study include the small size of the sample population, the age of the data set, and that the data cannot be broken out by age groups. An advantage of this survey is that the RDD procedure (Waksberg Method) used provides unbiased results of sample selection and reduces the number of unproductive calls. Another advantage of this study is that it provides empirical data on frequency and duration of consumer use.

17.3.4. Westat (1987b)—National Household Survey of Interior Painters

Westat (1987b) conducted a nationwide study between November 1985 and January 1986 to obtain usage information that estimates the magnitude of exposure of consumers to different types of painting and painting-related products used while painting the interior of the home. The study sampled 777 households to determine whether any household member had painted the interior of the home during the 12 months prior to the survey date. Of the sampled households, 208 households (27%) had a household member who had painted during the past 12 months. Based on the households with primary painters, the response rate was 90% (Westat, 1987b). The person in each household who did most of the interior painting during the past 12 months was interviewed over the telephone. The RDD procedure (Waksberg Method) previously described in Westat (1987a) was used to generate sample blocks of telephone numbers in this survey. Questions were asked about the frequency and time spent for interior painting activities, the amount of paint used, and the protective measures used (i.e., wearing gloves, hats, and masks or keeping a window open) (Westat, 1987b). Fifty-three percent of the primary painters in the households interviewed were male, 46% were female, and the sex of the remaining 1% was not ascertained. Three types of painting products were used in this study: latex paint, oil-based paint, and wood stains and varnishes. Of the respondents, 94.7% used latex paint, 16.8% used oil-based paint, and 20.2% used wood stains and varnishes.

Table 17-13, Table 17-14, and Table 17-15 summarize data generated from this survey. Table 17-13 presents the mean, standard deviation, and percentile rankings for the total exposure time for painting activity by paint type. Table 17-14 presents the mean and median exposure times for each painting activity per occasion for each paint type. A painting occasion is defined as a time period from start to cleanup (Westat, 1987b). Table 17-14 also presents the frequency and percentile rankings of painting occasions per year. Table 17-15 presents the total amount of paint used by interior painters.

In addition, 30 respondents from the original survey were re-interviewed in April 1986 as a reliability check on the recall data. There were no significant differences between the data obtained from the re-interviews and the original painting survey (Westat, 1987b).

An advantage of this survey, based on the reliability check conducted by Westat (1987b), is the stability in the painting data obtained. Another advantage of this survey is that the response rate was high (90%), thus minimizing non-response bias. Also, the Waksberg Method employed provides an unbiased equal probability method of RDD. The limitations of the survey are that the data are based on 12-month recall and may not accurately reflect long-term use patterns and the age of the data set.

17.3.5. Abt (1992)—Methylene Chloride Consumer Use Study Survey Findings

As part of a plan to assess the effectiveness of labeling of consumer products containing methylene chloride, Abt (1992) conducted a nationwide telephone survey of nearly 5,000 households. The survey was conducted in April and May of 1991. Three classes of products were included: (1) paint strippers, (2) non-automotive spray paint, and (3) adhesive removers. The survey paralleled a 1986 consumer use survey conducted by Abt for the U.S. EPA.

The survey was conducted to estimate the percentage of the U.S. adult population using paint remover, adhesive remover, and non-automotive spray paint. In addition, an estimate of the population using these products containing methylene chloride was determined. A survey questionnaire was developed to collect product usage data and demographic data. The survey sample was generated using a RDD technique.

A total of 4,997 product screener interviews were conducted for the product interview sections. The number of respondents was 381 for paint strippers, 58 for adhesive removers, and 791 for non-automotive spray paint. Survey responses were weighted to allow estimation at the level of the total U.S. population (Abt, 1992). A follow-up mail survey

also was conducted by using a short questionnaire. Respondents who had used the product in the past year or had purchased the product in the past 2 years and still had the container were asked to respond to the questionnaire (Abt, 1992). Of the 527 mailed questionnaires, 259 were returned. The questionnaire responses included 67 on paint strippers, 6 on adhesive removers, and 186 on non-automotive spray paint. Table 17-16 through Table 17-21 (*N*s are unweighted) present the results of the survey. Data are presented for recent users, who were defined as persons who have used the product within the last year of the survey or who have purchased the product in the past 2 years.

Abt (1992) found the following results when comparing the new data to the 1986 findings:

- A significantly smaller proportion of current survey respondents used a paint stripper, spray paint, or adhesive remover.
- The proportion of the population who used the three products recently (within the past year) decreased substantially.
- Those who used the products reported a significantly longer time since their last use. For all three products, the reported amount used per year was significantly higher in the current survey.

An advantage of this survey is that the survey population was large, and the survey responses were weighted to represent the U.S. population. In addition, the survey was designed to collect data for frequency of product use and amount of product used by sex. Limitations of the survey are that the information may be dated, and that the data were generated based on recall behavior. Extrapolation of these data to accurately reflect long-term use patterns may be difficult.

17.3.6. U.S. EPA (1996)—National Human Activity Pattern Survey (NHAPS)

U.S. EPA (1996) collected data on the duration and frequency of selected activities and the time spent in selected microenvironments via 24-hour diaries as part of the National Human Activity Pattern Survey (NHAPS). More than 9,000 individuals from various age groups in 48 contiguous states participated in NHAPS, including 2,000 children. The survey was conducted between October 1992 and September 1994. Individuals were interviewed to categorize their 24-hour routines (diaries) and/or to answer follow-up questions that were related to exposure events. Demographic, including socioeconomic (e.g., sex, age, race, education), geographic (e.g., census region, state), and temporal (i.e., day of week, month, season) data were included in the study. Data were collected for a maximum of 82 possible microenvironments and 91 different activities.

As part of the survey, data also were collected on duration and frequency of use of selected consumer products. Table 17-22 through Table 17-30 present data on the number of minutes that survey respondents spent in activities working with or being near certain consumer products, including microwave ovens; freshly applied paints; household cleaning agents such as scouring powders or ammonia; floor wax, furniture wax, or shoe polish; glue; solvents, fumes, or strong-smelling chemicals; stain or spot removers; gasoline, diesel-powered equipment, or automobiles; and pesticides, bug sprays, or bug strips. Table 17-31 through Table 17-35 present data on the number of respondents in these age categories that used fragrances, aerosol sprays, humidifiers, and pesticides (professionally-applied and consumer-applied). Because the age categories used by the study authors did not coincide with the standardized age categories recommended in U.S. EPA (2005) and used elsewhere in this handbook, the source data from NHAPS on pesticide use (professionally applied and consumer-applied) were reanalyzed by U.S. EPA to generate data for the standardized age categories. Data for subsets of the 1st year of life (e.g., 1 to 2 months, 3 to 5 months, etc.) were not available.

As discussed in previous chapters that used NHAPS as a data source, the primary advantage is that the data were collected for a large number of individuals, and the survey was designed to be representative of the U.S. general population. However, due to the wording of questions in the survey, precise data were not available for consumers who spent more than 60 or 120 minutes (depending on the activity) using some consumer products. This prevents accurate characterization of the high end of the distribution and also may introduce error into the calculation of the mean. Another limitation is that the adult data were not broken down into finer age categories. These data are also based on 24-hour diaries and may not be representative of long-term use patterns.

17.3.7. Bass et al. (2001)—What's Being Used at Home: A Household Pesticide Survey

Bass et al. (2001) conducted a survey to assess the use of pesticide products in homes with

children in March 1999. The study obtained information on what pesticides were used, where they were used, and how frequently they were used. A total of 107 households in Arizona that had a least one child less than 10 years old in the household and had used a pesticide within the last 6 months were surveyed (Bass et al., 2001). The survey population was composed predominantly of Hispanic females and represented a survey response rate of approximately 74%. Study participants were selected by systematic random sampling. Pesticide use was assessed by a one-on-one interview in the home. Survey questions pertained to household pesticides used inside the house for insect control and outside the house for controlling weeds in the garden and repelling animals from the garden. As part of the interview, information was gathered on the pesticides' frequency of use.

Table 17-36 presents information on the type, characteristics, and frequency of pesticide use, as well as information on the demographics of the survey population. A total of 148 pesticide products were used in the 107 households surveyed. Respondents had used pesticides in the kitchen, bathroom, floors, baseboards, and cabinets with dishes or cookware. The frequency of use data showed the following: about 32% of the households used pesticides once per week or more; about 44% used the products once per month or once in 3 months; and about 19% used the products once in 6 months or once per year (Bass et al., 2001).

Although this study was limited to a selected area in Arizona, it provides useful information on the frequency of use of pesticides among households with children. This may be useful for populations in similar geographical locations where site-specific data are not available. However, these data are the result of a community-based survey and are not representative of the U.S. general population.

17.3.8. Weegels and van Veen (2001)—Variation of Consumer Contact With Household Products: A Preliminary Investigation

Weegels and van Veen (2001) conducted a survey to determine consumer exposure to common household products used once a day or every other day. Thirty households participated in the study, including 10 families with children, 10 couples, 9 individuals, and 1 household of 6 adults from the city of Delft in The Netherlands. Households were recruited through the Usability Panel of the School of Industrial Design and through public notices and pamphlets.

Three types of products were studied: dishwashing detergent, all-purpose cleaners, and hair-styling products. Three activities in which these products are commonly used were studied in more detail: dishwashing, toilet cleaning, and styling hair. In-home observations, diaries, and measurement of the amount of product utilized were used to collect data. Subjects were visited in their homes and videotaped performing the activities. After 3 weeks, subjects were again visited in their homes and videotaped performing activities, diaries were collected, and the amount of product used was measured.

Table 17-37 presents the survey data. During toilet cleaning, 22 of 29 subjects observed used at least two different products (e.g., toilet cleaner, all-purpose cleaner, and/or abrasive cleaner). The large variation in duration of toilet cleaning was due to the diverse ways in which toilet cleaner was used: some subjects left the toilet cleaner to soak overnight, some left it in the bowl while cleaning the remainder of the toilet, others flushed the toilet immediately after cleaning. The authors noted that the findings of the study suggest that "…individuals have a consistent way of using a product for a particular activity, but there is a large variety in product usage among consumers, with relations among frequency, durations and amount. If this conclusion is confirmed by future research, it suggests that there will be people who exhibit high-end use of products and will, most likely follow their own routine, which may have consequences for the definition of worst-case use of consumer products."

An advantage of this study is that the empirical data generated provide more accurate calculations of exposure than studies relying on recall data. Limitations of the study are the small study population (30 households) and that The Netherlands may not be representative of U.S. population behaviors. Another limitation is that the short duration (3 weeks) may not accurately reflect long-term or seasonal usage patterns.

17.3.9. Loretz et al. (2005)—Exposure Data for Cosmetic Products: Lipstick, Body Lotion, and Face Cream

Loretz et al. (2005) conducted a nationwide survey to estimate the usage (i.e., frequency of application and amount used per application) of lipstick, body lotion, and face cream. The study was conducted in 2000 and included 360 study subjects recruited in 10 U.S. cities (i.e., Atlanta, GA; Boston, MA; Chicago, IL; Denver, CO; Houston, TX; Minneapolis, MN; St. Louis, MO; San Bernardino,

CA; Tampa Bay, FL; and Seattle, WA). The survey participants were women, ages 19 to 65 years, who regularly used the products of interest. Typical cosmetic formulations of the three product types were weighed and provided to the women for use over a 2-week period. Subjects recorded information on product usage (e.g., whether the product was used, number of applications, time of applications) on a daily basis in a diary provided to them. At the end of the 2-week period, unused portions of product were returned and weighed. The amount of product used was estimated as the difference between the weight of product at the beginning and end of the survey period. Of the 360 subjects, 86.4%, 83.3%, and 85.6% completed the study and returned the diaries for lipstick, body lotion, and face cream, respectively (Loretz et al., 2005).

Table 17-38 and Table 17-39 present the survey data. Table 17-38 provides the mean, median, and standard deviations for the frequency of use. Table 17-39 provides distribution data for the total amount applied, the average amount applied per use day, and the average amount applied per application.

An advantage of this study is that the survey population covered a diverse geographical area of the United States and that it was not based on recall data. A limitation of the study is that the short duration (2 weeks) may not accurately reflect long-term usage patterns. Another limitation is that the study only included women who already used the products; therefore, the usage patterns are not representative of the entire female population. Also, the data are not presented by age group.

17.3.10. Loretz et al. (2006)—Exposure Data for Personal Care Products: Hairspray, Spray Perfume, Liquid Foundation, Shampoo, Body Wash, and Solid Antiperspirant

Loretz et al. (2006) conducted a nationwide survey to determine the usage (i.e., frequency of use and amount used) of hairspray, spray perfume, liquid foundation, shampoo, body wash, and solid antiperspirant. The survey was similar to that described by Loretz et al. (2005). This study was conducted in 2000 and 2001. A total of 360 women were recruited from 10 U.S. cities (Atlanta, GA; Boston, MA; Chicago, IL; Denver, CO; Houston, TX; Minneapolis, MN; St. Louis, MO; San Bernardino, CA; Tampa Bay, FL; and Seattle, WA). The survey participants were women, ages 19 to 65 years old, who regularly used the test products. Subjects kept daily records on product usage (e.g., whether the product was used, number of applications, time of applications) in a diary. For spray perfume, liquid foundation, and body wash, subjects recorded the body areas where these products were applied. For shampoo, subjects recorded information on their hair type (i.e., length, thickness, oiliness, straight or curly, and color treated or not). At the end of the 2-week period, unused portions of products were returned and weighed. Of the 360 subjects recruited per product, the study was completed by 91% of participants for hairspray, 91% for spray perfume, 94% for liquid foundation, and 94% for shampoo, body wash, and solid antiperspirant.

Table 17-40 through Table 17-42 present the survey data. Table 17-40 provides the minimum, maximum, mean, and standard deviations for the frequency of use. Table 17-41 provides percentile values for the amount of product applied per application. Table 17-42 provides distribution data for the amount applied per use day.

An advantage of this study is that the survey population covered a diverse geographical range of the United States and that it did not rely on recall data. A limitation of the study is that the short duration (2 weeks) may not accurately reflect long-term usage patterns. Another limitation is that the study only included women who already used these products; therefore, the usage patterns are not entirely representative of the entire female population. Also, the data are not presented by age group.

17.3.11. Hall et al. (2007)—European Consumer Exposure to Cosmetic Products, a Framework for Conducting Population Exposure Assessments

European cosmetic manufacturers constructed a probabilistic European population model of exposure for six cosmetic products: body lotion, deodorant/antiperspirant, lipstick, facial moisturizer, shampoo, and toothpaste (Hall et al., 2007). Data were collected by using both market information databases and a controlled product use study from 44,100 households and 18,057 individual consumers, creating a sample of the 249 million inhabitants of the 15 countries in the European Union. Tables Table 17-43 through Table 17-50 show the amount used in g/day and mg/kg-day. The study found an inverse correlation between frequency of product use and quantity used per application for body lotion, facial moisturizer, toothpaste, and shampoo, and so the authors cautioned against calculating daily exposure to these products by multiplying the maximum frequency value by the maximum quantity per event value.

The advantage of this study is that it included a large sample size. However, behaviors and activities in the European population may not be representative of the U.S. population, and results were not broken out by age groups.

17.3.12. Loretz et al. (2008)—Exposure Data for Cosmetic Products: Facial Cleanser, Hair Conditioner, and Eye Shadow

Loretz et al. (2008) used the data from a study conducted in 2005 to estimate frequency of use and usage amount for facial cleanser, hair conditioner, and eye shadow. The study was conducted in a similar manner as Loretz et al. (2006; 2005). A total of 360 women, ages 18 to 69 years, were recruited by telephone to provide diary records of product use during a 2-week period. The study subjects were representative of four U.S. Census regions (i.e., Northeast, Midwest, South, and West). A total of 295, 297, and 299 women completed the study for facial cleanser, hair conditioner, and eye shadow, respectively.

The participants recorded daily in a diary whether the product was used that day, the number of applications, and the time of applications during a 2-week period. Products were weighed at the start and completion of the study to determine the amount used. A statistical analysis of the data was conducted to provide summary distributions of use patterns, including number of applications, amount used per day, and amount of product used per application for each product. Table 17-51 provides data on the number of applications per use day. Table 17-52 shows the average amounts of product applied per use day, while Table 17-53 shows the average amounts of product applied per application.

The advantages of this study are that it is representative of the U.S. female population for users of the products studied, it provides data for frequency of use and amount used, and it provides distribution data. A limitation of the study is that the data were not provided by age group. In addition, the participants were regular users of the product, so the amount applied and the frequency of use may be higher than for other individuals who may use the products. According to Loretz et al. (2008), "…variability in amount used by the different subjects is high, but consistent with the data from other cosmetic and personal care studies." The authors also noted that it was not clear if the high-end users of products represented true usage. Data were also collected over a 2-week period and may not be representative of long-term usage patterns.

17.3.13. Sathyanarayana et al. (2008)—Baby Care Products; Possible Sources of Infant Phthalate Exposure

Sathyanarayana et al. (2008) investigated dermal exposure to phthalates via the dermal application of personal care products. The study was conducted on 163 infants born between 2000 and 2005. The products studied were baby lotion, baby powder, baby shampoo, diaper cream, and baby wipes. Infants were recruited through Future Families, a multicenter pregnancy cohort study, at prenatal clinics in Los Angeles, CA; Minneapolis, MN; and Columbia, MO. Although the study was designed to assess exposure to phthalates, the authors collected information on the percentage of the total participants who used the baby products. Data were collected from questionnaire responses of the mothers and at study visits. Table 17-54 shows the characteristics and the percentage of the population using the studied baby products. Of the 163 infants studied, 94% of the participants used baby wipes, and 54% used infant shampoo.

The advantages of this study are that it specifically targeted consumer products used by children, it captured the percentage of the study population using these products, and it collected the data from a diverse ethnic population. The limitation is that these data may not be entirely representative of the U.S. population because the study population was from only three states and the sample size was small. Also, this study did not contain any information on amount or frequency of product use.

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Table 17-1. Consumer Products Commonly Found in Some U.S. Households[a]

Consumer Product Category	Consumer Product	
Cosmetics Hygiene Products	• Adhesive bandages • Bath additives (liquid) • Bath additives (powder) • Cologne/perfume/aftershave • Contact lens solutions • Deodorant/antiperspirant (aerosol) • Deodorant/antiperspirant (wax and liquid) • Depilatories • Facial makeup • Fingernail cosmetics • Hair coloring/tinting products • Hair conditioning products • Hairsprays (aerosol)	• Lip products • Mouthwash/breath freshener • Sanitary napkins and pads • Shampoo • Shaving creams (aerosols) • Skin creams (non-drug) • Skin oils (non-drug) • Soap (toilet bar) • Sunscreen/suntan products • Talc/body powder (non-drug) • Toothpaste • Waterless skin cleaners
Household Furnishings	• Carpeting • Draperies/curtains • Rugs (area)	• Shower curtains • Vinyl upholstery, furniture
Garment Conditioning Products	• Anti-static spray (aerosol) • Leather treatment (liquid and wax) • Shoe polish • Spray starch (aerosol)	• Suede cleaner/polish (liquid and aerosol) • Textile water-proofing (aerosol)
Household Maintenance Products	• Adhesive (general) (liquid) • Bleach (household) (liquid) • Bleach (see laundry) • Candles • Cat box litter • Charcoal briquettes • Charcoal lighter fluid • Drain cleaner (liquid and powder) • Dishwasher detergent (powder) • Dishwashing liquid • Fabric dye (DIY)[b] • Fabric rinse/softener (liquid) • Fabric rinse/softener (powder) • Fertilizer (garden) (liquid) • Fertilizer (garden) (powder) • Fire extinguishers (aerosol) • Floor polish/wax (liquid) • Food packaging and packaged food • Furniture polish (liquid) • Furniture polish (aerosol) • General cleaner/disinfectant (liquid) • General cleaner (powder) • General cleaner/disinfectant (aerosol and pump) • General spot/stain remover (liquid) • General spot/stain remover (aerosol and pump) • Herbicide (garden-patio) (liquid and aerosol) • Insecticide (home and garden) (powder) • Insecticide (home and garden) (aerosol and pump)	• Insect repellent (liquid and aerosol) • Laundry detergent/bleach (liquid) • Laundry detergent (powder) • Laundry prewash/soak (powder) • Laundry prewash/soak (liquid) • Laundry prewash/soak (aerosol and pump) • Lubricant oil (liquid) • Lubricant (aerosol) • Matches • Metal polish • Oven cleaner (aerosol) • Pesticide (home) (solid) • Pesticide (pet dip) (liquid) • Pesticide (pet) (powder) • Pesticide (pet) (aerosol) • Pesticide (pet) (collar) • Petroleum fuels (home) (liquid and aerosol) • Rug cleaner/shampoo (liquid and aerosol) • Rug deodorizer/freshener (powder) • Room deodorizer (solid) • Room deodorizer (aerosol) • Scouring pad • Toilet bowl cleaner • Toiler bowl deodorant (solid) • Water-treating chemicals (swimming pools)

Table 17-1. Consumer Products Commonly Found in Some U.S. Households[a] (continued)

Consumer Product Category	Consumer Product	
Home Building/Improvement Products (DIY)[b]	• Adhesives, specialty (liquid) • Ceiling tile • Caulks/sealers/fillers • Dry wall/wall board • Flooring (vinyl) • House paint (interior) (liquid) • House paint and stain (exterior) (liquid) • Insulation (solid) • Insulation (foam)	• Paint/varnish removers • Paint thinner/brush cleaners • Patching/ceiling plaster • Roofing • Refinishing products (e.g., polyurethane, varnishes) • Spray paints (home) (aerosol) • Wall paneling • Wall paper • Wall paper glue
Automobile-Related Products	• Antifreeze • Car polish/wax • Fuel/lubricant additives • Gasoline/diesel fuel • Interior upholstery/components, synthetic	• Motor oil • Radiator flush/cleaner • Automotive touch-up paint (aerosol) • Windshield washer solvents
Personal Materials	• Clothes/shoes • Diapers/vinyl pants • Jewelry • Printed material (colorprint, newsprint, photographs)	• Sheets/towels • Toys (intended to be placed in mouths)

[a] A subjective listing based on consumer use profiles.
[b] DIY = do it yourself.

Source: U.S. EPA (1987).

Table 17-2. List of Product Categories in the Simmons Study of Media and Markets	
The volumes included in the Media series are as follows:	
M1	Publications: Total Audiences
M2	Publications: Qualitative Measurements and In-Home Audiences
M3	Publications: Duplication of Audiences
M4	Multi-Media Audiences: Adults
M5	Multi-Media Audiences: Males
M6	Multi-Media Audiences: Females and Mothers
M7	Business to Business
M8	Multi-Media Reach and Frequency and Television Attentiveness and Special Events
The following volumes are included in the Product series:	
P1	Automobiles, Cycles, Trucks and Vans
P2	Automotive Products and Services
P3	Travel
P4	Banking, Investments, Insurance, Credit Cards and Contributions, Memberships and Public Activities
P5	Games and Toys, Children's and Babies' Apparel and Specialty Products
P6	Computers, Books, Discs, Records, Tapes, Stereo, Telephones, TV and Video
P7	Appliances, Garden Care, Sewing and Photography
P8	Home Furnishings and Home Improvements
P9	Sports and Leisure
P10	Restaurants, Stores and Grocery Shopping
P11	Direct Mail and Other In-Home Shopping, Yellow Pages, Florist, Telegrams, Faxes and Greeting Cards
P12	Jewelry, Watches, Luggage, Writing Tools and Men's Apparel
P13	Women's Apparel
P14	Distilled Spirits, Mixed Drinks, Malt Beverages, Wine and Tobacco Products
P15	Coffee, Tea, Cocoa, Milk, Soft Drinks, Juices and Bottled Water
P16	Dairy Products, Desserts, Baking and Bread Products
P17	Cereals and Spreads, Rice, Pasta, Pizza, Mexican Foods, Fruits and Vegetables
P18	Soup, Meat, Fish, Poultry, Condiments and Dressings
P19	Chewing Gum, Candy, Cookies and Snacks
P20	Soap, Laundry, Paper Products and Kitchen Wraps
P21	Household Cleaners, Room Deodorizers, Pest Controls and Pet Foods
P22	Health Care Products and Remedies
P23	Oral Hygiene Products, Skin Care, Deodorants and Drug Stores
P24	Hair Care, Shaving Products and Fragrances
P25	Women's Beauty Aids, Cosmetics and Personal Products
P26	Relative Volume of Consumption

Table 17-3. Amount and Frequency of Use of Various Cosmetic and Baby Products

Product Type	Amount of Product per Application[a] (grams)	Average Frequency of Use (per day)			Upper 90th Percentile Frequency of Use (per day)		
		Survey Type			Survey Type		
		CTFA	Cosmetic Co.	Market[b] Research Bureau	CTFA	Cosmetic Co.	Market Research Bureau
Baby Lotion - baby use[c]	1.4	0.38	1.0	–	0.57	2.0	–
Baby Lotion - adult use	1.0	0.22	0.19	0.24[d]	0.86	1.0	1.0[d]
Baby Oil - baby use[c]	1.3	0.14	1.2	–	0.14	3.0	–
Baby Oil - adult use	5.0	0.06	0.13	–	0.29	0.57	–
Baby Powder - baby use[c]	0.8	5.36	1.5	0.35[d]	8.43	3.0	1.0[d]
Baby Powder - adult use	0.8	0.13	0.22	–	0.57	1.0	–
Baby Cream - baby use[c]	–	0.43	1.3	–	0.43	3.0	–
Baby Cream - adult use	–	0.07	0.10	–	0.14	0.14[e]	–
Baby Shampoo - baby use[c]	0.5	0.14	–	0.11[f]	0.14	–	0.43[f]
Baby Shampoo - adult use	5.0	0.02	–	–	0.86[e]	–	–
Bath Oils	14.7	0.08	0.19	0.22[g]	0.29	0.86	1.0[g]
Bath Tablets	–	0.003	0.008	–	0.14[e]	0.14[e]	–
Bath Salts	18.9	0.006	0.013	–	0.14[e]	0.14[e]	–
Bubble Baths	11.8	0.088	0.13	–	0.43	0.57	–
Bath Capsules	–	0.018	0.019	–	0.29[e]	0.14[e]	–
Bath Crystals	–	0.006	–	–	0.29[e]	0.14[e]	–
Eyebrow Pencil	–	0.27	0.49	–	1.0	1.0	–
Eyeliner	–	0.42	0.68	0.27	1.43	1.0	1.0
Eye Shadow	–	0.69	0.78	0.40	1.43	1.0	1.0
Eye Lotion	–	0.094	0.34	–	0.43	1.0	–
Eye Makeup Remover	–	0.29	0.45	–	1.0	1.0	–
Mascara	–	0.79	0.87	0.46	1.29	1.0	1.5
Under Eye Cover	–	0.79	–	–	0.29	–	–
Blusher and Rouge	0.011	1.18	1.24	0.55	2.0	1.43	1.5
Face Powders	0.085	0.35	0.67	0.33	1.29	1.0	1.0
Foundations	0.265	0.46	0.78	0.47	1.0	1.0	1.5
Leg and Body Paints	–	0.003	0.011	–	0.14[e]	0.14[e]	–
Lipstick and Lip Gloss	–	1.73	1.23	2.62	4.0	2.86	6.0
Makeup Bases	0.13	0.24	0.64	–	0.86	1.0	–

Table 17-3. Amount and Frequency of Use of Various Cosmetic and Baby Products (continued)

Product Type	Amount of Product per Application[a] (grams)	Average Frequency of Use (per day)			Upper 90th Percentile Frequency of Use (per day)		
		Survey Type			Survey Type		
		CTFA	Cosmetic Co.	Market[b] Research Bureau	CTFA	Cosmetic Co.	Market Research Bureau
Makeup Fixatives	–	0.052	0.12	–	0.14	1.0	–
Sunscreen	3.18	0.003	–	0.002	0.14[e]	–	0.005
Colognes and Toilet Water	0.65	0.68	0.85	0.56	1.71	1.43	1.5
Perfumes	0.23	0.29	0.26	0.38	0.86	1.0	1.5
Powders	2.01	0.18	0.39	–	1.0	1.0	–
Sachets	0.2	0.0061	0.034	–	0.14[e]	0.14[e]	–
Fragrance Lotion	–	0.0061	–	–	0.29[e]	–	–
Hair Conditioners	12.4	0.4	0.40	0.27	1.0	1.0	0.86
Hair Sprays	–	0.25	0.55	0.32	1.0	1.0	1.0
Hair Rinses	12.7	0.064	0.18	–	0.29	1.0	–
Shampoos	16.4	0.82	0.59	0.48	1.0	1.0	1.0
Tonics and Dressings	2.9	0.073	0.021	–	0.29	0.14[d]	–
Wave Sets	2.6	0.003[h]	0.040	–	–[h]	0.14	–
Dentifrices	–	1.62	0.67	2.12	2.6	2.0	4.0
Mouthwashes	–	0.42	0.62	0.58	1.86	1.14	1.5
Breath Fresheners	–	0.052	0.43	0.46	0.14	1.0	0.57
Nail Basecoats	0.2	0.052	0.13	–	0.29	0.29	–
Cuticle Softeners	0.7	0.040	0.10	–	0.14	0.29	–
Nail Creams and Lotions	0.6	0.070	0.14	–	0.29	0.43	–
Nail Extenders	–	0.003	0.013	–	0.14[e]	0.14[e]	–
Nail Polish and Enamel	0.3	0.16	0.20	0.07	0.71	0.43	1.0
Nail Polish and Enamel Remover	3.1	0.088	0.19	–	0.29	0.43	–
Nail Undercoats	–	0.049	0.12	–	0.14	0.29	–
Bath Soaps	2.6	1.53	0.95	–	3.0	1.43	–
Underarm Deodorants	0.5	1.01	0.80	1.10	1.29	1.29	2.0
Douches	–	0.013	0.089	0.085	0.14[e]	0.29	0.29
Feminine Hygiene Deodorants	–	0.021	0.084	0.05	1.0[e]	0.29	0.14
Cleansing Products (cold creams, cleansing lotions, liquids, and pads)	1.7	0.63	0.80	0.54	1.71	2.0	1.5
Depilatories	–	0.0061	0.051	0.009	0.016	0.14	0.033

Table 17-3. Amount and Frequency of Use of Various Cosmetic and Baby Products (continued)

Product Type	Amount of Product per Application[a] (grams)	Average Frequency of Use (per day)			Upper 90th Percentile Frequency of Use (per day)		
		Survey Type			Survey Type		
		CTFA	Cosmetic Co.	Market[b] Research Bureau	CTFA	Cosmetic Co.	Market Research Bureau
Face, Body and Hand Preps (excluding shaving preps)	3.5	0.65	–	1.12	2.0	–	2.14
Foot Powder and Sprays	–	0.061	0.079	–	0.57[e]	0.29	–
Hormones	–	0.012	0.028	–	0.57[e]	0.14[e]	–
Moisturizers	0.5	0.98	0.88	0.63	2.0	1.71	1.5
Night Skin Care Products	1.3	0.18	0.50	–	1.0	1.0	–
Paste Masks (mud packs)	3.7	0.027	0.20	–	0.14	0.43	–
Skin Lighteners	–	–	0.024	–	–[e]	0.14[e]	–
Skin Fresheners and Astringents	2.0	0.33	0.56	–	1.0	1.43	–
Wrinkle Smoothers (removers)	0.4	0.021	0.15	–	1.0[d]	1.0	–
Facial Cream	0.6	0.0061	–	–	0.0061	–	–
Permanent Wave	101	0.003	–	0.001	0.0082	–	0.005
Hair Straighteners	0.2	0.0007	–	–	0.005[e]	–	–
Hair Dye	–	0.001	–	0.005	0.004[e]	–	0.014
Hair Lighteners	–	0.0003	–	–	0.005[e]	–	–
Hair Bleaches	–	0.0005	–	–	0.02[e]	–	–
Hair Tints	–	0.0001	–	–	0.005[e]	–	–
Hair Rinse (coloring)	–	0.0004	–	–	0.02[e]	–	–
Shampoo (coloring)	–	0.0005	–	–	0.02[e]	–	–
Hair Color Spray	–	–	–	–	–[e]	–	–
Shave Cream	1.73	–	–	0.082	–	–	0.36

[a] Values reported are the averages of the responses reported by the 20 companies interviewed.

[b] The averages shown for the Market Research Bureau are not true averages - this is due to the fact that in many cases the class of most frequent users is indicated by "1 or more"; also, ranges are used in many cases (i.e., "10-12"). The average, therefore, is underestimated slightly. The "1 or more" designation also skews the 90th percentile figures in many instances. The 90th percentile values may, in actuality, be somewhat higher for many products.

[c] Average usage among users only for baby products.

[d] Usage data reflects entire household use for both baby lotion and baby oil.

[e] Fewer than 10% of individuals surveyed used these products. Value listed is lowest frequency among individuals reporting usage. In the case of wave sets, skin lighteners, and hair color spray, none of the individuals surveyed by the CTFA used this product during the period of the study.

[f] Usage data reflects entire household use.

[g] Usage data reflects total bath product usage.

[h] None of the individuals surveyed reported using this product.

(–) indicate no data available.

Source: CTFA (1983).

Table 17-4. Frequency of Use for Household Solvent Products (users only)

Products	Mean (use/year)	SD	Percentile Rankings for Frequency of Use/Year										
			Min	1	5	10	25	50	75	90	95	99	Max
Spray Shoe Polish	10.28	20.10	1.00	1.00	1.00	1.00	2.00	4.00	8.00	24.30	52.00	111.26	156.00
Water Repellents/Protectors	3.50	11.70	1.00	1.00	1.00	1.00	1.00	2.00	3.00	6.00	10.00	35.70	300.00
Spot Removers	15.59	43.34	1.00	1.00	1.00	1.00	2.00	3.00	10.00	40.00	52.00	300.00	365.00
Solvent-Type Cleaning Fluids or Degreasers	16.46	44.12	1.00	1.00	1.00	1.00	2.00	4.00	12.00	46.00	52.00	300.00	365.00
Wood Floor and Paneling Cleaners	8.48	20.89	1.00	1.00	1.00	1.00	NA	2.00	6.00	24.00	50.00	56.00	350.00
Typewriter Correction Fluid	40.00	74.78	1.00	1.00	1.00	2.00	4.00	12.00	40.00	100.00	200.00	365.00	520.00
Adhesives	8.89	26.20	1.00	1.00	1.00	1.00	2.00	3.00	6.00	15.00	28.00	100.00	500.00
Adhesive Removers	4.22	12.30	1.00	1.00	1.00	1.00	1.00	1.00	3.00	6.00	16.80	100.00	100.00
Silicone Lubricants	10.32	25.44	1.00	1.00	1.00	1.00	2.00	3.00	10.00	20.00	46.35	150.00	300.00
Other Lubricants (excluding automotive)	10.66	25.46	1.00	1.00	1.00	1.00	2.00	4.00	10.00	20.00	50.00	100.00	420.00
Specialized Electronic Cleaners (e.g., for TVs)	13.41	38.16	1.00	1.00	1.00	1.00	2.00	3.00	10.00	24.00	52.00	224.50	400.00
Latex Paint	3.93	20.81	1.00	1.00	1.00	1.00	1.00	2.00	4.00	6.00	10.00	30.00	800.00
Oil Paint	5.66	23.10	1.00	1.00	1.00	1.00	1.00	1.00	3.00	6.00	12.00	139.20	300.00
Wood Stains, Varnishes, and Finishes	4.21	12.19	1.00	1.00	1.00	1.00	1.00	2.00	4.00	7.00	12.00	50.80	250.00
Paint Removers/Strippers	3.68	9.10	1.00	1.00	1.00	1.00	4.00	2.00	3.00	6.00	11.80	44.56	100.00
Paint Thinners	6.78	22.10	0.03	0.03	0.10	0.23	1.00	2.00	4.00	12.00	23.00	100.00	352.00
Aerosol Spray Paint	4.22	15.59	1.00	1.00	1.00	1.00	1.00	2.00	4.00	6.10	12.00	31.05	365.00
Primers and Special Primers	3.43	8.76	1.00	1.00	1.00	1.00	1.00	1.00	3.00	6.00	10.00	50.06	104.00
Aerosol Rust Removers	6.17	9.82	1.00	1.00	1.00	1.00	1.00	2.00	6.00	15.00	24.45	50.90	80.00
Outdoor Water Repellents (for wood or cement)	2.07	3.71	1.00	1.00	1.00	1.00	1.00	2.00	2.00	3.00	5.90	12.00	52.00
Glass Frostings, Window Tints, and Artificial Snow	2.78	21.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	27.20	365.00
Engine Degreasers	4.18	13.72	1.00	1.00	1.00	1.00	1.00	2.00	3.25	6.70	12.00	41.70	300.00
Carburetor Cleaners	3.77	7.10	1.00	1.00	1.00	1.00	1.00	2.00	3.00	6.00	12.00	47.28	100.00
Aerosol Spray Paints for Cars	4.50	9.71	1.00	1.00	1.00	1.00	1.00	2.00	4.00	10.00	15.00	60.00	100.00
Auto Spray Primers	6.42	33.89	1.00	1.00	1.00	1.00	1.00	2.00	3.75	10.00	15.00	139.00	500.00
Spray Lubricant for Cars	10.31	30.71	1.00	1.00	1.00	1.00	2.00	3.00	6.00	20.00	40.00	105.60	365.00
Transmission Cleaners	2.28	3.55	1.00	NA	1.00	1.00	1.00	1.00	2.00	3.00	9.00	NA	26.00
Battery Terminal Protectors	3.95	24.33	1.00	1.00	1.00	1.00	1.00	2.00	2.00	4.00	6.55	41.30	365.00
Brake Quieters Cleaners	3.00	6.06	1.00	NA	1.00	1.00	1.00	2.00	2.00	6.00	10.40	NA	52.00
Gasket Remover	2.50	4.39	1.00	NA	1.00	1.00	1.00	1.00	2.00	5.00	6.50	NA	30.00
Tire/Hubcap Cleaners	11.18	18.67	1.00	1.00	1.00	1.00	2.00	4.00	12.00	30.00	50.00	77.00	200.00
Ignition and Wire Dryers	3.01	5.71	1.00	1.00	1.00	1.00	1.00	2.00	3.00	5.00	9.70	44.52	60.00

NA = Not available.
SD = Standard deviation.
Min/Max = Minimum/Maximum.

Source: Westat (1987a).

Table 17-5. Exposure Time of Use for Household Solvent Products (users only)

Products	Mean (minutes)	SD	Percentile Rankings for Duration of Use (minutes)										
			Min	1	5	10	25	50	75	90	95	99	Max
Spray Shoe Polish	7.49	9.60	0.02	0.03	0.25	0.50	2.00	5.00	10.00	18.00	30.00	60.00	60.00
Water Repellents/Protectors	14.46	24.10	0.02	0.08	0.50	1.40	3.00	10.00	15.00	30.00	60.00	120.00	480.00
Spot Removers	10.68	22.36	0.02	0.03	0.08	0.25	2.00	5.00	10.00	30.00	30.00	120.00	360.00
Solvent-Type Cleaning Fluids or Degreasers	29.48	97.49	0.02	0.03	1.00	2.00	5.00	15.00	30.00	60.00	120.00	300.00	1,800.00
Wood Floor and Paneling Cleaners	74.04	128.43	0.02	1.00	5.00	10.00	20.00	30.00	90.00	147.00	240.00	480.00	2,700.00
Typewriter Correction Fluid	7.62	29.66	0.02	0.02	0.03	0.03	0.17	1.00	2.00	10.00	32.00	120.00	480.00
Adhesives	15.58	81.80	0.02	0.03	0.08	0.33	1.00	4.25	10.00	30.00	60.00	180.00	2,880.00
Adhesive Removers	121.20	171.63	0.03	0.03	1.45	3.00	15.00	60.00	120.00	246.00	480.00	960.00	960.00
Silicone Lubricants	10.42	29.47	0.02	0.03	0.08	0.17	0.50	2.00	10.00	20.00	45.00	180.00	360.00
Other Lubricants (excluding automotive)	8.12	32.20	0.02	0.03	0.05	0.08	0.50	2.00	5.00	15.00	30.00	90.00	900.00
Specialized Electronic Cleaners (e.g., for TVs)	9.47	45.35	0.02	0.03	0.08	0.17	0.50	2.00	5.00	20.00	30.00	93.60	900.00
Latex Paint	295.08	476.11	0.02	1.00	22.50	30.00	90.00	180.00	360.00	480.00	810.00	2,880.00	5,760.00
Oil Paint	194.12	345.68	0.02	0.51	15.00	30.00	60.00	12.00	240.00	480.00	579.00	1,702.80	5,760.00
Wood Stains, Varnishes, and Finishes	117.17	193.05	0.02	0.74	5.00	10.00	30.00	60.00	120.00	140.00	360.00	720.00	280.00
Paint Removers/Strippers	125.27	286.59	0.02	0.38	5.00	5.00	20.00	60.00	120.00	240.00	420.00	1,200.00	4,320.00
Paint Thinners	39.43	114.85	0.02	0.08	1.00	2.00	5.00	10.00	30.00	60.00	180.00	480.00	2,400.00
Aerosol Spray Paint	39.54	87.79	0.02	0.17	2.00	5.00	10.00	20.00	45.00	60.00	120.00	300.00	1,800.00
Primers and Special Primers	91.29	175.05	0.05	0.24	3.00	5.00	15.00	30.00	120.00	240.00	360.00	981.60	1,920.00
Aerosol Rust Removers	18.57	48.54	0.02	0.05	0.17	0.25	2.00	5.00	20.00	60.00	60.00	130.20	720.00
Outdoor Water Repellents (for wood or cement)	104.94	115.36	0.02	0.05	5.00	15.00	30.00	60.00	120.00	240.00	300.00	480.00	960.00
Glass Frostings, Window Tints, and Artificial Snow	29.45	48.16	0.03	0.14	2.00	3.00	5.00	15.00	30.00	60.00	96.00	268.80	360.00
Engine Degreasers	29.29	48.14	0.02	0.95	2.00	5.00	10.00	15.00	30.00	60.00	120.00	180.00	900.00
Carburetor Cleaners	13.57	23.00	0.02	0.08	0.33	1.00	3.00	7.00	15.00	30.00	45.00	120.00	300.00
Aerosol Spray Paints for Cars	42.77	71.39	0.03	0.19	1.00	3.00	10.00	20.00	60.00	120.00	145.00	360.00	900.00
Auto Spray Primers	51.45	86.11	0.05	0.22	2.00	5.00	10.00	27.50	60.00	120.00	180.00	529.20	600.00
Spray Lubricant for Cars	9.90	35.62	0.02	0.03	0.08	0.17	1.00	5.00	10.00	15.00	30.00	120.00	720.00
Transmission Cleaners	27.90	61.44	0.17	NA	0.35	1.80	5.00	15.00	30.00	60.00	60.00	NA	450.00
Battery Terminal Protectors	9.61	18.15	0.03	0.04	0.08	0.23	1.00	5.00	10.00	20.00	30.00	120.00	180.00
Brake Quieters/Cleaners	23.38	36.32	0.07	NA	0.50	1.00	5.00	15.00	30.00	49.50	120.00	NA	240.00
Gasket Remover	23.57	27.18	0.33	NA	0.50	2.00	6.25	15.00	30.00	60.00	60.00	NA	180.00
Tire/Hubcap Cleaners	22.66	23.94	0.08	0.71	3.00	5.00	10.00	15.00	30.00	60.00	60.00	120.00	240.00
Ignition and Wire Dryers	7.24	8.48	0.02	0.02	0.08	0.47	1.50	5.00	10.00	15.00	25.50	48.60	60.00

NA = Not available.

SD = Standard deviation.
Min/Max = Minimum/Maximum.

Source: Westat (1987a).

Table 17-6. Amount of Products Used for Household Solvent Products (users only)

Products	Mean (ounces/year)	SD	Percentile Rankings for Amount of Products Used (ounces/year)										
			Min.	1	5	10	25	50	75	90	95	99	Max
Spray Shoe Polish	9.90	17.90	0.04	0.20	0.63	1.00	2.00	4.50	10.00	24.00	36.00	99.36	180.00
Water Repellents/Protectors	11.38	22.00	0.04	0.47	0.98	1.43	2.75	6.00	12.00	24.00	33.00	121.84	450.00
Spot Removers	26.32	90.10	0.01	0.24	0.60	1.00	2.00	5.50	16.00	48.00	119.20	384.00	1,600.00
Solvent-Type Cleaning Fluids or Degreasers	58.30	226.97	0.04	0.50	2.00	3.00	6.50	16.00	32.00	96.00	192.00	845.00	5,120.00
Wood Floor and Paneling Cleaners	28.41	57.23	0.03	0.80	2.45	3.50	7.00	14.00	30.00	64.00	96.00	204.40	1,144.00
Typewriter Correction Fluid	4.14	13.72	0.01	0.02	0.06	0.12	0.30	0.94	2.40	8.00	18.00	67.44	181.80
Adhesives	7.49	55.90	0.01	0.02	0.05	0.12	0.35	1.00	3.00	8.00	20.00	128.00	1,280.00
Adhesive Removers	34.46	96.60	0.25	0.29	1.22	2.80	6.00	10.88	32.00	64.00	138.70	665.60	1,024.00
Silicone Lubricants	12.50	27.85	0.02	0.20	0.69	1.00	2.25	4.50	12.00	24.00	41.20	192.00	312.00
Other Lubricants (excluding automotive)	9.93	44.18	0.01	0.18	0.30	0.52	1.00	2.25	8.00	18.00	32.00	128.00	1,280.00
Specialized Electronic Cleaners (e.g., for TVs)	9.48	55.26	0.01	0.05	0.13	0.25	0.52	2.00	6.00	12.65	24.00	109.84	1,024.00
Latex Paint	371.27	543.86	0.03	4.00	12.92	32.00	64.00	256.00	384.00	857.60	1,280.00	2,560.00	6,400.00
Oil Paint	168.92	367.82	0.02	0.33	4.00	8.00	25.20	64.00	148.48	384.00	640.00	1,532.16	5,120.00
Wood Stains, Varnishes, and Finishes	65.06	174.01	0.12	1.09	4.00	4.00	8.00	16.00	64.00	128.00	256.00	768.00	3,840.00
Paint Removers/Strippers	63.73	144.33	0.64	1.50	4.00	8.00	16.00	32.00	64.00	128.00	256.00	512.00	2,560.00
Paint Thinners	69.45	190.55	0.03	0.45	3.10	4.00	8.00	20.48	64.00	128.00	256.00	640.00	3,200.00
Aerosol Spray Paint	30.75	52.84	0.02	0.75	2.01	3.25	7.00	13.00	32.00	65.00	104.00	240.00	1,053.00
Primers and Special Primers	68.39	171.21	0.01	0.09	1.30	3.23	8.00	16.00	60.00	128.00	256.00	867.75	1,920.00
Aerosol Rust Removers	18.21	81.37	0.09	0.25	1.00	1.43	2.75	8.00	13.00	32.00	42.60	199.80	1,280.00
Outdoor Water Repellents (for wood or cement)	148.71	280.65	0.01	0.37	3.63	8.00	16.00	64.00	128.00	448.00	640.00	979.20	3,200.00
Glass Frostings, Window Tints, and Artificial Snow	13.82	14.91	1.00	1.40	2.38	3.25	6.00	12.00	14.00	28.00	33.00	98.40	120.00
Engine Degreasers	46.95	135.17	0.04	1.56	4.00	6.00	12.00	16.00	36.00	80.00	160.00	480.00	2,560.00
Carburetor Cleaners	22.00	50.60	0.10	0.50	1.50	3.00	5.22	12.00	16.00	39.00	75.00	212.00	672.00
Aerosol Spray Paints for Cars	44.95	89.78	0.04	0.14	1.50	3.00	6.12	16.00	48.00	100.80	156.00	557.76	900.00
Auto Spray Primers	70.37	274.56	0.12	0.77	3.00	4.00	9.00	16.00	48.00	128.00	222.00	1,167.36	3840.00
Spray Lubricant for Cars	18.63	54.74	0.08	0.40	0.96	1.00	2.75	6.00	15.50	36.00	64.00	240.00	864.00
Transmission Cleaners	35.71	62.93	2.00	NA	3.75	4.00	8.00	15.00	32.00	77.00	140.00	NA	360.00
Battery Terminal Protectors	16.49	87.84	0.12	0.13	0.58	1.00	2.00	4.00	8.00	15.00	24.60	627.00	1,050.00
Brake Quieters/Cleaners	11.72	13.25	0.50	NA	1.00	2.00	3.02	8.00	14.25	32.00	38.60	NA	78.00
Gasket Remover	13.25	22.35	0.50	NA	1.00	1.00	3.75	7.75	16.00	24.00	58.40	NA	160.00
Tire/Hubcap Cleaners	31.58	80.39	0.12	0.50	1.82	3.00	6.00	12.00	28.00	64.00	96.00	443.52	960.00
Ignition and Wire Dryers	9.02	14.59	0.13	0.32	1.09	1.50	3.00	6.00	10.75	16.00	20.55	113.04	120.00

NA = Not available.
SD = Standard deviation.
Min/Max = Minimum/Maximum.

Source: Westat (1987a).

Table 17-7. Time Exposed After Duration of Use for Household Solvent Products (users only)

Products	Mean (minutes)	SD	Percentile Rankings for Time Exposed After Duration of Use (minutes)										
			Min.	1	5	10	25	50	75	90	95	99	Max
Spray Shoe Polish	31.40	80.50	0.00	0.00	0.00	0.00	0.00	5.00	20.00	120.00	120.00	480.00	720.00
Water Repellents/Protectors	37.95	111.40	0.00	0.00	0.00	0.00	0.00	3.00	20.00	120.00	240.00	480.00	1,800.00
Spot Removers	43.65	106.97	0.00	0.00	0.00	0.00	1.00	5.00	30.00	120.00	240.00	480.00	1,440.00
Solvent-Type Cleaning Fluids or Degreasers	33.29	90.39	0.00	0.00	0.00	0.00	0.00	3.00	28.75	60.00	180.00	480.00	1,440.00
Wood Floor and Paneling Cleaners	96.75	192.88	0.00	0.00	0.00	0.00	5.00	30.00	120.00	240.00	480.00	1,062.00	1,440.00
Typewriter Correction Fluid	124.70	153.46	0.00	0.00	1.00	5.00	30.00	60.00	180.00	360.00	480.00	600.00	1,800.00
Adhesives	68.88	163.72	0.00	0.00	0.00	0.00	1.00	10.00	60.00	180.00	360.00	720.00	2,100.00
Adhesive Removers	94.12	157.69	0.00	0.00	0.00	0.00	1.75	20.00	120.00	360.00	480.00	720.00	720.00
Silicone Lubricants	30.77	107.39	0.00	0.00	0.00	0.00	0.00	0.00	10.00	60.00	180.00	480.00	1,440.00
Other Lubricants (excluding automotive)	47.45	127.11	0.00	0.00	0.00	0.00	0.00	2.00	30.00	120.00	240.00	485.40	1,440.00
Specialized Electronic Cleaners (e.g., for TVs)	117.24	154.38	0.00	0.00	0.00	1.00	10.00	60.00	180.00	300.00	480.00	720.00	1,440.00
Latex Paint	91.38	254.61	0.00	0.00	0.00	0.00	0.00	5.00	60.00	240.00	480.00	1,440.00	2,880.00
Oil Paint	44.56	155.19	0.00	0.00	0.00	0.00	0.00	0.00	30.00	120.00	240.00	480.00	2,880.00
Wood Stains, Varnishes, and Finishes	48.33	156.44	0.00	0.00	0.00	0.00	0.00	1.00	30.00	120.00	240.00	694.00	2,880.00
Paint Removers/Strippers	31.38	103.07	0.00	0.00	0.00	0.00	0.00	0.00	20.00	60.00	180.00	541.20	1,440.00
Paint Thinners	32.86	105.62	0.00	0.00	0.00	0.00	0.00	0.00	15.00	60.00	180.00	480.00	1,440.00
Aerosol Spray Paint	12.70	62.80	0.00	0.00	0.00	0.00	0.00	0.00	1.00	30.00	60.00	260.50	1,440.00
Primers and Special Primers	22.28	65.57	0.00	0.00	0.00	0.00	0.00	0.00	10.00	60.00	120.00	319.20	720.00
Aerosol Rust Removers	15.06	47.58	0.00	0.00	0.00	0.00	0.00	0.00	5.00	60.00	60.00	190.20	600.00
Outdoor Water Repellents (for wood or cement)	8.33	43.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	58.50	309.60	420.00
Glass Frostings, Window Tints, and Artificial Snow	137.87	243.21	0.00	0.00	0.00	0.00	3.00	60.00	180.00	360.00	480.00	1,440.00	1,800.00
Engine Degreasers	4.52	24.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.50	120.00	360.00
Carburetor Cleaners	7.51	68.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	30.00	120.60	1,800.00
Aerosol Spray Paints for Cars	10.71	45.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.50	60.00	282.00	480.00
Auto Spray Primers	11.37	45.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	77.25	360.00	360.00
Spray Lubricant for Cars	4.54	30.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	15.00	70.20	420.00
Transmission Cleaners	5.29	29.50	0.00	NA	0.00	0.00	0.00	0.00	0.00	5.00	22.50	NA	240.00
Battery Terminal Protectors	3.25	17.27	0.00	NA	0.00	0.00	0.00	0.00	0.00	2.90	15.00	120.00	180.00
Brake Quieters/Cleaners	10.27	30.02	0.00	NA	0.00	0.00	0.00	0.00	0.00	30.00	120.00	NA	120.00
Gasket Remover	27.56	58.54	0.00	NA	0.00	0.00	0.00	0.00	12.50	120.00	180.00	NA	240.00
Tire/Hubcap Cleaners	1.51	20.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	480.00
Ignition and Wire Dryers	6.39	31.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	30.00	216.60	240.00

NA = Not available.
SD = Standard deviation.
Min/Max = Minimum/Maximum.

Source: Westat (1987a).

Table 17-8. Total Exposure Time of Performing Task and Product Type Used by Task for Household Cleaning Products

Tasks	Mean (hours/year)	Median (hours/year)	Product Type Used	Percent of Preference
Clean Bathroom Sinks and Tubs	44	26	Liquid	29%
			Powder	44%
			Aerosol	16%
			Spray pump	10%
			Other	1%
Clean Kitchen Sinks	41	18	Liquid	31%
			Powder	61%
			Aerosol	2%
			Spray pump	4%
			Other	2%
Clean Inside of Cabinets (e.g., kitchen)	12	5	Liquid	68%
			Powder	12%
			Aerosol	2%
			Spray pump	16%
			Other	2%
Clean Outside of Cabinets	21	6	Liquid	61%
			Powder	8%
			Aerosol	16%
			Spray pump	13%
			Other	2%
Wipe Off Kitchen Counters	92	55	Liquid	67%
			Powder	13%
			Aerosol	2%
			Spray pump	15%
			Other	3%
Thoroughly Clean Counters	24	13	Liquid	56%
			Powder	21%
			Aerosol	5%
			Spray pump	17%
			Other	1%
Clean Bathroom Floors	20	9	Liquid	70%
			Powder	21%
			Aerosol	2%
			Spray pump	4%
			Other	3%
Clean Kitchen Floors	31	14	Liquid	70%
			Powder	27%
			Aerosol	2%
			Spray pump	1%
			Other	-
Clean Bathroom or Other tilted or Ceramic Walls	16	9	Liquid	37%
			Powder	18%
			Aerosol	17%
			Spray pump	25%
			Other	3%

Table 17-8. Total Exposure Time of Performing Task and Product Type Used by Task for Household Cleaning Products (continued)

Tasks	Mean (hours/year)	Median (hours/year)	Product Type Used	Percent of Preference
Clean Outside of Windows	13	6	Liquid	27%
			Powder	2%
			Aerosol	6%
			Spray pump	65%
			Other	-
Clean Inside of Windows	18	6	Liquid	24%
			Powder	1%
			Aerosol	8%
			Spray pump	66%
			Other	2%
Clean Glass Surfaces Such as Mirrors and Tables	34	13	Liquid	13%
			Powder	1%
			Aerosol	8%
			Spray pump	76%
			Other	2%
Clean Outside of Refrigerator and Other Appliances	27	13	Liquid	48%
			Powder	3%
			Aerosol	7%
			Spray pump	38%
			Other	4%
Clean Spots or Dirt on Walls or Doors Finishes	19	8	Liquid	46%
			Powder	15%
			Aerosol	4%
			Spray pump	30%
			Other	4%

- Indicates value is less than 1%.

Source: Westat (1987c).

Table 17-9. Percentile Rankings for Total Exposure Time in Performing Household Tasks

	Percentile Rankings for Total Exposure Time Performing Task (hours/year)							
Tasks	Min	10th	25th	50th	75th	90th	95th	Max
Clean Bathroom Sinks and Tubs	0.4	5.2	13	26	52	91.3	121.7	365
Clean Kitchen Sinks	0.3	3.5	8.7	18.3	60.8	97.6	121.7	547.5
Clean Inside of Kitchen Cabinets	0.2	1	2	4.8	12	32.5	48	208
Clean Outside of Cabinets	0.1	1	2	6	17.3	36	78.7	780
Wipe Off Kitchen Counters	1.2	12	24.3	54.8	91.5	231.2	456.3	912.5
Thoroughly Clean Counters	0.2	1.8	6	13	26	52	94.4	547.5
Clean Bathroom Floors	0.1	2	4.3	8.7	26	36.8	71.5	365
Clean Kitchen Floors	0.5	4.3	8.7	14	26	52	97	730
Clean Bathroom or Other Tilted or Ceramic Walls	0.2	1	3	8.7	26	36	52	208
Clean Outside of Windows	0.1	1.5	2	6	11.5	24	32.6	468
Clean Inside of Windows	0.2	1.2	3	6	19.5	36	72	273
Clean Glass Surfaces Such as Mirrors and Tables	0.2	1.7	6	13	26	60.8	104	1460
Clean Outside Refrigerator and Other Appliances	0.1	1.8	4.3	13	30.4	91.3	95.3	365
Clean Spots or Dirt on Walls or Doors	0.1	0.6	2	8	24	52	78	312

Min = Minimum.
Max = Maximum.

Source: Westat (1987c).

Table 17-10. Mean Percentile Rankings for Frequency of Performing Household Tasks

Tasks	Mean	Percentile Rankings							
		Min	10th	25th	50th	75th	90th	95th	Max
Clean Bathroom Sinks and Tubs	3 ×/week	0.2 ×/week	1 ×/week	1 ×/week	2 ×/week	3.5 ×/week	7 ×/week	7 ×/week	42 ×/week
Clean Kitchen Sinks	7 ×/week	0 ×/week	1 ×/week	2 ×/week	7 ×/week	7 ×/week	15 ×/week	21 ×/week	28 ×/week
Clean Inside of Cabinets Such as Those in the Kitchen	9 ×/year	1 ×/year	1 ×/year	1 ×/year	2 ×/year	12 ×/year	12 ×/year	52 ×/year	156 ×/year
Clean Outside of Cabinets	3 ×/month	0.1 ×/month	0.1 ×/month	0.3 ×/month	1 ×/month	4 ×/month	4 ×/month	22 ×/month	30 ×/month
Wipe Off Counters Such as Those in the Kitchen	2 ×/day	0 ×/day	0.4 ×/day	1 ×/day	1 ×/day	3 ×/day	4 ×/day	6 ×/day	16 ×/day
Thoroughly Clean Counters	8 ×/month	0.1 ×/month	0.8 ×/month	1 ×/month	4 ×/month	4 ×/month	30 ×/month	30 ×/month	183 ×/month
Clean Bathroom Floors	6 ×/month	0.2 ×/month	1 ×/month	2 ×/month	4 ×/month	4 ×/month	13 ×/month	30 ×/month	30 ×/month
Clean Kitchen Floors	6 ×/month	0.1 ×/month	1 ×/month	2 ×/month	4 ×/month	4 ×/month	13 ×/month	30 ×/month	30 ×/month
Clean Bathroom or Other Tiled or Ceramic Walls	4 ×/month	0.1 ×/month	0.2 ×/month	1 ×/month	2 ×/month	4 ×/month	9 ×/month	13 ×/month	30 ×/month
Clean Outside of Windows	5 ×/year	1 ×/year	1 ×/year	1 ×/year	2 ×/year	4 ×/year	12 ×/year	12 ×/year	156 ×/year
Clean Inside of Windows	10 ×/year	1 ×/year	1 ×/year	2 ×/year	4 ×/year	12 ×/year	24 ×/year	52 ×/year	156 ×/year
Clean Other Glass Surfaces such as Mirrors and Tables	7 ×/month	0.1 ×/month	1 ×/month	2 ×/month	4 ×/month	4 ×/month	17 ×/month	30 ×/month	61 ×/month
Clean Outside of Refrigerator and Other Appliances	10 ×/month	0.2 ×/month	1 ×/month	2 ×/month	4 ×/month	13 ×/month	30 ×/month	30 ×/month	61 ×/month
Clean Spots or Dirt on Walls or Doors	6 ×/month	0.1 ×/month	0.2 ×/month	0.3 ×/month	1 ×/month	4 ×/month	13 ×/month	30 ×/month	152 ×/month

Min = Minimum.
Max = Maximum.

Source: Westat (1987c).

Table 17-11. Mean and Percentile Rankings for Exposure Time per Event of Performing Household Tasks

Tasks	Mean (minutes/event)	Percentile Rankings (minutes/event)							
		Min	10th	25th	50th	75th	90th	95th	Max
Clean Bathroom Sinks and Tubs	20	1	5	10	15	30	45	60	90
Clean Kitchen Sinks	10	1	2	3	5	10	15	20	480
Clean Inside of Cabinets Such as Those in the Kitchen	137	5	24	44	120	180	240	360	2,880
Clean Outside of Cabinets	52	1	5	15	30	60	120	180	330
Wipe Off Counters Such as Those in the Kitchen	9	1	2	3	5	10	15	30	120
Thoroughly Clean Counters	25	1	5	10	15	30	60	90	180
Clean Bathroom Floors	16	1	5	10	15	20	30	38	60
Clean Kitchen Floors	30	2	10	15	20	30	60	60	180
Clean Bathroom or Other Tiled or Ceramic Walls	34	1	5	15	30	45	60	120	240
Clean Outside of Windows	180	4	30	60	120	240	420	480	1,200
Clean Inside of Windows	127	4	20	45	90	158	300	381	1,200
Clean Other Glass Surfaces Such as Mirrors and Tables	24	1	5	10	15	30	60	60	180
Clean Outside of Refrigerator and Other Appliances	19	1	4	5	10	20	30	45	240
Clean Spots or Dirt on Walls or Doors	50	1	5	10	20	60	120	216	960

Min = Minimum.
Max = Maximum.
Source: Westat (1987c).

Table 17-12. Total Exposure Time for Ten Product Groups Most Frequently Used for Household Cleaning[a]

Products	Mean (hours/year)	Percentile Rankings of Total Exposure Time (hours/year)							
		Min	10th	25th	50th	75th	90th	95th	Max
Dish Detergents	107	0.2	6	24	56	134	274	486	941
Glass Cleaners	67	0.4	3	12	29	62	139	260	1,508
Floor Cleaners	52	0.7	4	7	22	52	102	414	449
Furniture Polish	32	0.1	0.3	1	12	36	101	215	243
Bathroom Tile Cleaners	47	0.5	2	8	17	48	115	287	369
Liquid Cleansers	68	0.2	2	9	22	52	122	215	2,381
Scouring Powders	78	0.3	9	17	35	92	165	281	747
Laundry Detergents	66	0.6	8	14	48	103	174	202	202
Rug Cleaners/Shampoos	12	0.3	0.3	0.3	9	26	26	26	26
All Purpose Cleaners	64	0.3	4	9	26	77	174	262	677

[a] The data in Table 17-12 reflect only the 14 tasks included in the survey. Therefore, many of the durations reported in the table underestimate the hours of the use of the product group. For example, use of dish detergents to wash dishes is not included.
Min = Minimum.
Max = Maximum.
Source: Westat (1987c).

Table 17-13. Total Exposure Time of Painting Activity of Interior Painters (hours)

Types of Paint	Mean (hours)	SD	Percentile Rankings for Duration of Painting Activity (hours)							
			Min	10	25	50	75	90	95	Max
Latex	12.2	11.3	1	3	4	9	15	24	40	248
Oil-Based	10.7	15.6	1	1.6	3	6	10	21.6	65.6	72
Wood Stains and Varnishes	8.6	10.9	1	1	2	4	9.3	24	40	42

SD = Standard deviation.
Min = Minimum.
Max = Maximum.

Source: Westat (1987b).

Table 17-14. Exposure Time of Interior Painting Activity/Occasion (hours) and Frequency of Occasions Spent Painting per Year

	Duration of Painting/Occasion (hours)		Frequency of Occasions Spent Painting/Year		Percentile Rankings for Frequency of Occasions Spent Painting							
Types of Paint	Mean	Median	Mean	SD	Min	10	25	50	75	90	95	Max
Latex	3.0	3	4.2	5.5	1	1	2	3	4	9	10	62
Oil-Based	2.1	3	5.1	12.0	1	1	1	2	4	8	26	72
Wood Stains and Varnishes	2.2	2	4.0	4.9	1	1	1	2	4	9	20	20

SD = Standard deviation.
Min = Minimum.
Max = Maximum.

Source: Westat (1987b).

Table 17-15. Amount of Paint Used by Interior Painters

Types of Paint	Median (gallons)	Mean (gallons)	SD	Percentile Rankings for Amount of Paint Used (gallons)							
				Min	10	25	50	75	90	95	Max
Latex	3.0	3.9	4.6	0.1	1	2	3	5	8	10	50
Oil-Based	2.0	2.6	3.0	0.1	0.3	0.5	2	3	7	12	12
Wood Stains and Varnishes	0.8	0.9	0.8	0.1	0.1	0.3	0.8	1	2	2	4.3

SD = Standard deviation.
Min = Minimum.
Max = Maximum.

Source: Westat (1987b).

Table 17-16. Frequency of Use and Amount of Product Used for Adhesive Removers

	No. of Times Used Within the Last 12 Months $N = 58$	Minutes Using $N = 52$	Minutes in Room After Using[a] $N = 51$	Minutes in Room After Using[b] $N = 5$	Amount Used in Past Year (fluid oz.) $N = 51$	Amount per Use (fluid oz.) $N = 51$
Mean	1.66	172.87	13.79	143.37	96.95	81.84
Standard Deviation	1.67	304.50	67.40	169.31	213.20	210.44
Minimum Value	1.00	5.00	0.00	5.00	13.00	5.20
1st Percentile	1.00	5.00	0.00	5.00	13.00	5.20
5th Percentile	1.00	10.00	0.00	5.00	13.00	6.50
10th Percentile	1.00	15.00	0.00	5.00	16.00	10.67
25th Percentile	1.00	29.50	0.00	20.00	16.00	16.00
Median Value	1.00	120.00	0.00	120.00	32.00	26.00
75th Percentile	2.00	240.00	0.00	420.00	96.00	64.00
90th Percentile	3.00	480.00	0.00	420.00	128.00	128.00
95th Percentile	5.00	1,440.00	120.00	420.00	384.00	192.00
99th Percentile	12.00	1,440.00	420.00	420.00	1,280.00	1,280.00
Maximum Value	12.00	1,440.00	420.00	1,440.00	1,280.00	1,280.00

[a] Includes those who did not spend any time in the room after use.
[b] Includes only those who spent time in the room.

Source: Abt (1992).

Table 17-17. Adhesive Remover Usage by Sex

	Sex	
	Males $N = 25$	Females $N = 33$
Mean number of months since last time adhesive remover was used – includes all respondents (unweighted $N = 240$).	35.33	43.89
Mean number of uses of product in the past year.	1.94	1.30
Mean number of minutes spent with the product during last use.	127.95	233.43
Mean number of minutes spent in the room after last use of product. (Includes all recent users.)	19.76	0
Mean number of minutes spent in the room after last use of product. (Includes only those who did not leave immediately.)	143.37	0
Mean ounces of product used in the past year.	70.48	139.71
Mean ounces of product used per use in the past year.	48.70	130.36

Source: Abt (1992).

Table 17-18. Frequency of Use and Amount of Product Used for Spray Paint

	No. of Times Used Within the Last 12 Months *N* = 775	Minutes Using *N* = 786	Minutes in Room After Using[a] *N* = 791	Minutes in Room After Using[b] *N* = 35	Amount Used in Past Year (fluid oz.) *N* = 778	Amount per Use (fluid oz.) *N* = 778
Mean	8.23	40.87	3.55	65.06	83.92	19.04
Standard Deviation	31.98	71.71	22.03	70.02	175.32	25.34
Minimum Value	1.00	1.00	0.00	1.00	13.00	0.36
1st Percentile	1.00	1.00	0.00	1.00	13.00	0.36
5th Percentile	1.00	3.00	0.00	1.00	13.00	3.47
10th Percentile	1.00	5.00	0.00	10.00	13.00	6.50
25th Percentile	1.00	10.00	0.00	15.00	13.00	9.75
Median Value	2.00	20.00	0.00	30.00	26.00	13.00
75th Percentile	4.00	45.00	0.00	60.00	65.00	21.67
90th Percentile	11.00	90.00	0.00	120.00	156.00	36.11
95th Percentile	20.00	120.00	0.00	120.00	260.00	52.00
99th Percentile	104.00	360.00	120.00	300.00	1,170.00	104.00
Maximum Value	365.00	960.00	300.00	300.00	1,664.00	312.00

[a] Includes those who did not spend any time in the room after use.
[b] Includes only those who spent time in the room.

Source: Abt (1992).

Table 17-19. Spray Paint Usage by Sex

	Sex	
	Males *N* = 405	Females *N* = 386
Mean number of months since last time spray paint was used – includes all respondents (unweighted *N* = 1724).	17.39	26.46
Mean number of uses of product in the past year.	10.45	4.63
Mean number of minutes spent with the product during last use.	40.87	40.88
Mean number of minutes spent in the room after last use of product. (Includes all recent users.)	5.49	0.40
Mean number of minutes spent in the room after last use of product. (Includes only those who did not leave immediately.)	67.76	34.69
Mean ounces of product used in the past year.	103.07	59.99
Mean ounces of product used per use in the past year.	18.50	19.92

Source: Abt (1992).

Table 17-20. Frequency of Use and Amount of Product Used for Paint Removers/Strippers

	No. of Times Used Within the Last 12 Months *N* = 316	Minutes Using *N* = 390	Minutes in Room After Using[a] *N* = 390	Minutes in Room After Using[b] *N* = 39	Amount Used in Past Year (fluid oz.) *N* = 307	Amount per Use (fluid oz.) *N* = 307
Mean	3.54	144.59	12.96	93.88	142.05	64.84
Standard Deviation	7.32	175.54	85.07	211.71	321.73	157.50
Minimum Value	1.00	2.00	0.00	1.00	15.00	0.35
1st Percentile	1.00	5.00	0.00	1.00	15.00	2.67
5th Percentile	1.00	15.00	0.00	1.00	16.00	8.00
10th Percentile	1.00	20.00	0.00	3.00	16.00	10.67
25th Percentile	1.00	45.00	0.00	10.00	32.00	16.00
Median Value	2.00	120.00	0.00	60.00	64.00	32.00
75th Percentile	3.00	180.00	0.00	120.00	128.00	64.00
90th Percentile	6.00	360.00	10.00	180.00	256.00	128.00
95th Percentile	12.00	480.00	60.00	420.00	384.00	192.00
99th Percentile	50.00	720.00	180.00	1,440.00	1,920.00	320.00
Maximum Value	70.00	1,440.00	1,440.00	1,440.00	3,200.00	2,560.00

[a] Includes those who did not spend any time in the room after use.
[b] Includes only those who spent time in the room.

Source: Abt (1992).

Table 17-21. Paint Stripper Usage by Sex

	Sex	
	Males *N* = 156	Females *N* = 162
Mean number of months since last time paint stripper was used – includes all respondents (unweighted *N* = 1724).	32.07	47.63
Mean number of uses of product in the past year.	3.88	3.01
Mean number of minutes spent with the product during last use.	136.70	156.85
Mean number of minutes spent in the room after last use of product. (Includes all recent users.)	15.07	9.80
Mean number of minutes spent in the room after last use of product. (Includes only those who did not leave immediately.)	101.42	80.15
Mean ounces of product used in the past year.	160.27	114.05
Mean ounces of product used per use in the past year.	74.32	50.29

Source: Abt (1992).

Table 17-22. Number of Minutes Spent Using Any Microwave Oven (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
5 to 11 years	62	0	0	0	1	1	2	5	10	15	20	30	30
12 to 17 years	141	0	0	0	1	2	3	5	10	15	30	30	60
18 to 64 years	1,686	0	0	1	2	3	5	10	15	25	45	60	121
> 64 years	375	0	0	1	2	3	5	10	20	30	60	60	70

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-23. Number of Minutes Spent in Activities Working With or Near Freshly Applied Paints (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	7	3	3	3	3	5	15	121	121	121	121	121	121
5 to 11 years	12	5	5	5	15	20	45	120	120	121	121	121	121
12 to 17 years	20	0	0	0.5	3	8	45	75	121	121	121	121	121
18 to 64 years	212	0	0	1	2	11	60	121	121	121	121	121	121
> 64 years	20	0	0	0	3	18	90	121	121	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-24. Number of Minutes Spent in Activities Working With or Near Household Cleaning Agents Such as Scouring Powders or Ammonia (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	21	0	0	0	0	5	10	15	20	30	121	121	121
5 to 11 years	26	1	1	2	2	3	5	15	30	30	30	30	30
12 to 17 years	41	0	0	0	0	2	5	10	40	60	60	60	60
18 to 64 years	672	0	0	1	2	5	10	20	60	121	121	121	121
> 64 years	127	0	0	0	1	3	5	15	30	60	120	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-25. Number of Minutes Spent in Activities (at home or elsewhere) Working With or Near Floorwax, Furniture Wax, or Shoe Polish (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	13	0	0	0	5	10	15	20	60	121	121	121	121
5 to 11 years	21	0	0	2	2	3	5	10	35	60	120	120	120
12 to 17 years	15	0	0	0	1	2	10	25	45	121	121	121	121
18 to 64 years	238	0	0	2	3	5	15	30	120	121	121	121	121
> 64 years	34	0	0	0	2	5	10	20	35	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-26. Number of Minutes Spent in Activities Working With or Near Glue (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	6	0	0	0	0	30	30	30	50	50	50	50	50
5 to 11 years	36	2	2	3	5	5	12.5	25	30	60	120	120	120
12 to 17 years	34	0	0	1	2	5	10	30	30	60	120	120	120
18 to 64 years	207	0	0	0	1	5	20	90	121	121	121	121	121
> 64 years	10	0	0	0	0	0	4	60	121	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-27. Number of Minutes Spent in Activities Working With or Near Solvents, Fumes, or Strong Smelling Chemicals (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	7	0	0	0	0	1	5	60	121	121	121	121	121
5 to 11 years	16	0	0	0	2	5	5	17.5	45	70	70	70	70
12 to 17 years	38	0	0	0	0	5	10	60	121	121	121	121	121
18 to 64 years	407	0	0	1	2	5	30	121	121	121	121	121	121
> 64 years	21	0	0	0	0	2	5	15	121	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-28. Number of Minutes Spent in Activities Working With or Near Stain or Spot Removers (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	3	0	0	0	0	0	0	3	3	3	3	3	3
5 to 11 years	3	3	3	3	3	3	5	5	5	5	5	5	5
12 to 17 years	7	0	0	0	0	5	15	35	60	60	60	60	60
18 to 64 years	87	0	0	0	0	2	5	15	60	121	121	121	121
> 64 years	9	0	0	0	0	2	3	15	121	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-29. Number of Minutes Spent in Activities Working With or Near Gasoline or Diesel-Powered Equipment, Besides Automobiles (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	14	0	0	0	1	5	22.5	120	121	121	121	121	121
5 to 11 years	12	1	1	1	3	7.5	25	50	60	60	60	60	60
12 to 17 years	25	2	2	5	5	13	35	120	121	121	121	121	121
18 to 64 years	312	0	0	1	3	15	60	121	121	121	121	121	121
> 64 years	26	2	2	2	3	10	25	90	121	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; *percentiles* are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-30. Number of Minutes Spent in Activities Working With or Near Pesticides, Including Bug Sprays or Bug Strips (minutes/day)

Age Group	Percentiles												
	N	1	2	5	10	25	50	75	90	95	98	99	Max
1 to 4 years	6	1	1	1	1	3	10	15	20	20	20	20	20
5 to 11 years	16	0	0	0	0	1.5	7.5	30	121	121	121	121	121
12 to 17 years	10	0	0	0	0	2	2.5	40	121	121	121	121	121
18 to 64 years	190	0	0	0	1	2	10	88	121	121	121	121	121
> 64 years	764	31	0	0	0	02	5	15	60	121	121	121	121

Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent; *N* = doer sample size; percentiles are the percentage of doers below or equal to a given number of minutes.

Source: U.S. EPA (1996).

Table 17-31. Number of Respondents Using Cologne, Perfume, Aftershave, or Other Fragrances at Specified Daily Frequencies

Age Group	Total *N*	Number of Times Used in a Day				
		1 to 2	3 to 5	6 to 9	10+	Do Not Know
5 to 11 years	26	24	2	*	*	*
12 to 17 years	144	133	9	*	1	1
18 to 64 years	1,735	1,635	93	3	1	3
> 64 years	285	277	8	0	0	0

* = Missing data.
N = Number of respondents.

Source: U.S. EPA (1996).

Table 17-32. Number of Respondents Using Any Aerosol Spray Product or Personal Care Item Such as Deodorant or Hair Spray at Specified Daily Frequencies

Age Group	Total *N*	Number of Times Used in a Day									
		1	2	3	4	5	6	7	10	10+	Don't Know
1 to 4 years	40	30	9	0	0	1	0	0	0	0	0
5 to 11 years	75	57	14	1	1	1	1	0	0	0	0
12 to 17 years	103	53	31	12	4	1	0	0	1	1	0
18 to 64 years	1,071	724	263	39	15	13	1	1	2	8	5
> 64 years	175	141	27	4	0	0	0	0	0	1	2

N = Number of respondents.

Source: U.S. EPA (1996).

Table 17-33. Number of Respondents Using a Humidifier at Home

Age Group	Total *N*	Frequency				
		Almost Every Day	3–5 Times a Week	1−2 Times a Week	1−2 Times a Month	Don't Know
1 to 4 years	111	33	16	7	53	2
5 to 11 years	88	18	10	12	46	2
12 to 17 years	83	21	7	5	49	1
18 to 64 years	629	183	77	70	287	12
> 64 years	120	42	10	10	53	5

N = Number of respondents.

Source: U.S. EPA (1996).

Table 17-34. Number of Respondents Indicating Pesticides Were Applied by a Professional at Home to Eradicate Insects, Rodents, or Other Pests at Specified Frequencies

Age Group	Total *N*	Frequency (number of times over a 6-month period that pesticides were applied by a professional)					
		None	1 to 2	3 to 5	6 to 9	10+	Don't Know
<1 year	15	9	4	1	1	0	0
1 to <2 years	23	13	5	3	1	1	0
2 to <3 years	32	9	15	5	3	0	0
3 to <6 years	80	51	22	5	2	0	0
6 to <11 years	106	59	22	7	17	1	0
11 to <16 years	115	68	35	4	6	0	2
16 to <21 years	87	40	36	2	5	1	3
18 to 64 years	1,264	660	387	89	97	15	16
> 64 years	243	146	55	15	19	3	5

N = Number of respondents.

Source: U.S. EPA reanalysis of NHAPS (U.S. EPA, 1996) data.

Table 17-35. Number of Respondents Reporting Pesticides Applied by the Consumer at Home to Eradicate Insects, Rodents, or Other Pests at Specified Frequencies

Age Group	Total *N*	Frequency (number of times over a 6-month period that pesticides were applied by a resident)					
		None	1 to 2	3 to 5	6 to 9	10+	Don't Know
<1 year	15	4	8	2	0	1	0
1 to <2 years	23	11	10	1	0	1	0
2 to <3 years	32	18	9	2	2	1	0
3 to <6 years	80	26	35	18	1	0	0
6 to <11 years	106	37	49	14	1	4	1
11 to <16 years	115	37	50	18	4	6	0
16 to <21 years	87	36	33	9	4	4	1
18 to 64 years	1,264	473	477	192	48	55	19
> 64 years	243	94	85	31	15	9	9

N = Number of respondents.

Source: U.S. EPA reanalysis of NHAPS (U.S. EPA, 1996) data.

Table 17-36. Household Demographics and Pesticide Types, Characteristics, and Frequency of Pesticide Use

	Number[a]	Percent[a]
Survey Population Demographics		
Sex		
Female	90	84.1
Male	17	15.9
Language of Interview		
Spanish	72	67.3
English	35	32.7
Reading Skills		
Able to read English	71	66.4
Able to read Spanish	95	88.8
Number in Household		
2 to 3 people	25	23.3
4 to 5 people	59	55.1
6 to 8 people	23	21.4
Children under 10 years		
1 child	37	34.6
2 children	45	42.1
3 to 5 children	25	23.3
Type of Home		
Single family detached	75	70.1
Multi-family	9	8.4
Trailer/mobile home	9	8.4
Single-family attached	8	7.5
Apartment/other	4	3.7
Pets		
Pets kept in household	55	51.4
Pesticides used on pets	22	40.0
Pesticide Use		
Type of Pesticide		
Insecticide	135	91.2
Rodenticide	10	6.8
Herbicide	3	2.0
Storage of Pesticide		
Kitchen	67	45.3
Garage/shed	30	20.3
Laundry/washroom	14	9.4
Other, inside home	11	7.4
Other, outside home	7	4.7
Bathroom	7	4.7
Basement	4	2.7
Closet	4	2.7
Storage Precautions		
Child-resistant container	83	56.1
Pesticide locked away	55	37.2
Storage Risks		
< 4 feet from ground	72	48.6
Kept near food	5	3.4
Kept near dishes/cookware	5	3.4
Disposal		
Throw it away	132	89.2
Wrap in separate container, throw away	10	6.8
Other	5	3.4
Frequency of Use		
More than once/week	20	13.5
Once/week	27	18.2
Once/month	42	28.4
Once every 3 months	23	15.5
Once every 6 months	16	10.8
Once/year	13	8.8
Time Stored in Home		
< 6 months	75	50.7
6 to 12 months	24	15.2
12 to 24 months	17	11.5
> 24 months	16	10.8

[a] Totals may not add up to 107 participants or 148 products, and percentages may not add up to 100 because of some non-responses to survey questions.

Source: Bass et al. (2001).

Table 17-37. Amount and Frequency of Use of Household Products

Product Type	Overall						Per Subject	
	Mean	SD	Min	Max	Subjects	Events	Min	Max
Dishwashing Liquid								
Frequency of use per day	0.63	0.79	0	5	45	596	0.05	2.29
Duration of contact (minutes)	11	5	1	60	45	596	2	35
Amount used per contact (grams)	5	3	1	16	13	163	2	10
All-Purpose Cleaner								
Frequency of use per day	0.35	0.70	0	4	28	218	0.050	1.82
Duration of contact (minutes)	20	22	1	135	28	204	5	60
Amount used per contact (grams)	27	30	1	123	12	105	2	74
Toilet Cleaner								
Frequency of use per day	0.28	0.55	0	2	18	105	0.05	1.67
Duration of contact (minutes)	74	204	1	1,209	28	101	2[a]	24[a]
Amount used per contact (grams)	-	-	-	-	-	-	9	153
Hair Spray								
Frequency of use per day	0.76	0.68	0	3	9	143	0.29	1.76
Amount used per contact (grams)	-	-	-	-	-	-	1.0	11.6
Duration of release (seconds)	11	6	5	25	12	-	-	-
Duration of contact with nebula (seconds)	23	11	5	41	12	-	-	-
Duration of contact with nebula × gram released (seconds × grams)	48	48	5	150	10	-	-	-

[a] Excludes durations over 30 minutes.

\- Indicates insufficient sample size to estimate average use.

Source: Weegels and van Veen (2001).

Table 17-38. Frequency of Use of Cosmetic Products

Product Type	*N*	Number of Applications per Day		
		Mean	Median	SD
Lipstick	311	2.35	2	1.80
Body lotion, hands	308	2.12	2	1.59
Body lotion, arms	308	1.52	1	1.30
Body lotion, feet	308	0.95	1	1.01
Body lotion, legs	308	1.11	1	0.98
Body lotion, neck and throat	308	0.43	0	0.82
Body lotion, back	308	0.26	0	0.63
Body lotion, other	308	0.40	0	0.76
Face cream	300	1.77	2	1.16

N = Number of subjects (women, ages 19 to 65 years).
SD = Standard deviation.

Source: Loretz et al. (2005).

Table 17-39. Amount of Test Product Used (grams) for Lipstick, Body Lotion, and Face Cream

Summary Statistics	Total Amount Applied	Average[a] Amount Applied per Use Day	Average[b] Amount Applied per Application
Lipstick			
Minimum	0.001	0.000	0.000
Maximum	2.666	0.214	0.214
Mean	0.272	0.024	0.010
SD	0.408	0.034	0.018
Percentiles			
10^{th}	0.026	0.003	0.001
20^{th}	0.063	0.005	0.003
30^{th}	0.082	0.008	0.004
40^{th}	0.110	0.010	0.004
50^{th}	0.147	0.013	0.005
60^{th}	0.186	0.016	0.006
70^{th}	0.242	0.021	0.009
80^{th}	0.326	0.029	0.011
90^{th}	0.655	0.055	0.024
95^{th}	0.986	0.087	0.037
99^{th}	2.427	0.191	0.089
Best Fit Distributions and Parameters[c]	Lognormal Distribution GM = 0.14 GSD = 3.56 *p*-value (Gof) = 0.01	Lognormal Distribution GM = 0.01 GSD = 3.45 *p*-value (Gof) <0.01	Lognormal Distribution GM = 0.01 GSD = 3.29 *p*-value (Gof) <0.01
Body Lotion			
Minimum	0.67	0.05	0.05
Maximum	217.66	36.31	36.31
Mean	103.21	8.69	4.42
SD	53.40	5.09	4.19
Percentiles			
10^{th}	36.74	3.33	1.30
20^{th}	51.99	4.68	1.73
30^{th}	68.43	5.71	2.32
40^{th}	82.75	6.74	2.76
50^{th}	96.41	7.63	3.45
60^{th}	110.85	9.25	4.22
70^{th}	134.20	10.90	4.93
80^{th}	160.26	12.36	6.14

Table 17-39. Amount of Test Product used (grams) for Lipstick, Body Lotion and Face Cream (continued)

Summary Statistics	Total Amount Applied	Average[a] Amount Applied per Use Day	Average[b] Amount Applied per Application
90th	182.67	14.39	8.05
95th	190.13	16.83	10.22
99th	208.50	27.91	21.71
Best Fit Distributions and Parameters[c]	Beta Distribution[c] Alpha = 1.53 Beta = 1.77 Scale = 222.01 *p*-value (GoF) = 0.06	Gamma Distribution Location = -0.86 Scale = 2.53 Shape = 3.77 *p*-value (GoF) = 0.37	Lognormal Distribution GM = 3.26 GSD = 2.25 *p*-value (GoF) = 0.63
Face Cream			
Minimum	0.04	0.00	0.00
Maximum	55.85	42.01	21.01
Mean	22.36	2.05	1.22
SD	14.01	2.90	1.76
Percentiles			
10th	5.75	0.47	0.28
20th	9.35	0.70	0.40
30th	12.83	1.03	0.53
40th	16.15	1.26	0.67
50th	19.86	1.53	0.84
60th	23.79	1.88	1.04
70th	29.31	2.23	1.22
80th	36.12	2.90	1.55
90th	44.58	3.50	2.11
95th	48.89	3.99	2.97
99th	51.29	12.54	10.44
Best Fit Distributions and Parameters[c]	Triangle Distribution Minimum = -1.09 Maximum = 58.71 Likeliest = 7.53 *p*-value (GoF) = 0.27	Lognormal Distribution[c] GM = 1.39 GSD = 2.58 *p*-value (GoF) <0.01	Lognormal Distribution[c] GM = 0.80 GSD = 2.55 *p*-value (GoF) = 0.02

[a] Derived as the ratio of the total amount used to the number of use days.
[b] Derived as the ratio of the total amount used to the total number of applications during the survey.
[c] None of the tested distributions provided a good fit.
GM = Geometric mean.
GSD = Geometric standard deviation.
GoF = Goodness of fit.
Note: Data are for women, ages 19 to 65 years.

Source: Loretz et al. (2005).

Table 17-40. Frequency of Use of Personal Care Products

Product Type	*N*	Average Number of Applications per Use Day[a]			
		Mean	SD	Min	Max
Hairspray (aerosol)	165[b]	1.49	0.63	1.00	5.36
Hairspray (pump)	162	1.51	0.64	1.00	4.22
Liquid Foundation	326	1.24	0.32	1.00	2.00
Spray Perfume	326	1.67	1.10	1.00	11.64
Body Wash	340	1.37	0.58	1.00	6.36
Shampoo	340	1.11	0.24	1.00	2.14
Solid Antiperspirant	340	1.30	0.40	1.00	4.00

[a] Derived as the ratio of the number of applications to the number of use days.
[b] Subjects who completed the study but did not report their number of applications were excluded.
N = Number of subjects (women, ages 18 to 65 years).
SD = Standard deviation.

Source: Loretz et al. (2006).

Table 17-41. Average Amount of Product Applied per Application[a] (grams)

Summary Statistics	Hairspray (aerosol)	Hairspray (pump)	Spray Perfume	Liquid Foundation	Shampoo	Body Wash	Solid Antiperspirant
N	163[b]	161[b]	310[b]	321[b]	340	340	340
Mean	2.58	3.64	0.33	0.54	11.76	11.3	0.61
SD	2.26	3.50	0.41	0.52	8.77	6.9	0.56
Minimum	0.05	0.00	0.00	0.00	0.39	1.1	0.00
Maximum	14.08	21.44	5.08	2.65	67.89	58.2	5.55
Percentiles							
10th	0.66	0.70	0.06	0.08	3.90	4.6	0.14
20th	0.94	1.01	0.10	0.14	5.50	5.8	0.22
30th	1.26	1.59	0.13	0.19	6.78	7.1	0.30
40th	1.56	2.14	0.18	0.26	8.27	8.5	0.37
50th	1.83	2.66	0.23	0.36	9.56	9.5	0.45
60th	2.38	3.43	0.28	0.48	11.32	11.4	0.55
70th	2.87	3.84	0.36	0.63	13.29	13.4	0.69
80th	3.55	5.16	0.49	0.86	16.07	16.0	0.89
90th	5.33	7.81	0.68	1.23	22.59	21.1	1.25
95th	7.42	10.95	0.94	1.70	27.95	24.3	1.67
97.5th	8.77	14.68	1.25	2.07	35.65	28.4	2.15
99th[c]	11.30	15.52	1.73	2.36	51.12	35.1	2.52
Best Fit Distributions and Parameters	Lognormal Distribution	Lognormal Distribution	Lognormal Distribution	Lognormal Distribution	Lognormal	Gamma	Lognormal Distribution
	GM = 1.84 GSD = 2.40	GM = 2.44 GSD = 2.67	GM = 0.21 GSD = 3.01	GM = 0.33 GSD = 2.99	GM = 9.32 GSD = 2.02	Location = 0.51 Scale = 3.92 Shape = 2.76	GM = 0.43 GSD = 2.37
p-value (Kolmogorov-Smirnov)	0.06	0.07	0.077	0.041	0.1328	0.486	0.339

[a] Derived as the ratio of the total amount used to the total number of applications.
[b] Subjects who completed the study, but did not report their number of applications, or who did not return the unused portion of the product, were excluded.
[c] Estimate does not meet the minimum sample size criteria (N = 800) as set by the National Center for Health Statistics. For upper percentile (>75), the minimum sample size (N) satisfies the following rule: $n[8/(1-p)]$. http://www/cdc.gov/nchs/about/major/nhanes/nhanes3/nh3gui.pdf.

N = Number of subjects (women, ages 19 to 65 years).
SD = Standard deviation.
GM = Geometric mean.
GSD = Geometric standard deviation.

Source: Loretz et al. (2006).

Table 17-42. Average Amount of Product Applied per Use Day[a] (grams)

Summary Statistics	Hairspray (aerosol)	Hairspray (pump)	Spray Perfume	Liquid Foundation	Shampoo	Body Wash	Solid Antiperspirant
N	163[b]	161[b]	310[b]	321[b]	340	340	340
Mean	3.57	5.18	0.53	0.67	12.80	14.5	0.79
SD	3.09	4.83	0.57	0.65	9.11	8.5	0.78
Minimum	0.05	0.00	0.00	0.00	0.55	1.3	0.00
Maximum	18.25	24.12	5.08	3.00	67.89	63.4	5.55
Percentiles							
10th	0.84	0.91	0.08	0.10	4.12	5.7	0.17
20th	1.35	1.48	0.12	0.16	5.80	7.6	0.29
30th	1.65	2.33	0.19	0.23	7.32	9.3	0.38
40th	2.23	2.66	0.26	0.30	9.09	10.9	0.46
50th	2.71	3.74	0.34	0.45	10.75	12.9	0.59
60th	3.30	4.71	0.45	0.58	12.82	14.8	0.70
70th	3.89	5.67	0.61	0.76	14.73	17.4	0.86
80th	4.86	7.38	0.81	1.04	17.61	20.7	1.08
90th	7.73	12.22	1.45	1.76	23.63	25.5	1.70
95th	9.89	15.62	1.77	2.18	29.08	29.1	2.32
97.5th	13.34	19.41	1.86	2.40	36.46	35.6	3.33
99th[c]	15.05	23.98	2.01	2.70	51.12	43.5	4.42
Best fit distributions and parameters	Lognormal Distribution	Lognormal Distribution	Lognormal Distribution	Lognormal Distribution	Lognormal	Gamma	Lognormal Distribution
	GM = 2.57 GSD = 2.37	GM = 3.45 GSD = 2.70	GM = 0.30 GSD = 3.36	GM = 0.40 GSD = 3.10	Location = 0.38 Scale = 5.79 Shape = 2.15	Location = 0.67 Scale = 4.89 Shape = 2.84	GM = 0.56 GSD = 2.41
p-value (Kolmogorov-Smirnov)	0.05	0.05	0.075	0.047	0.8208	0.760	0.293

[a] Derived as the ratio of the total amount used to the total number of applications.

[b] Subjects who completed the study, but did not report their number of applications, or who did not return the unused portion of the product, were excluded.

[c] Estimate does not meet the minimum sample size criteria (N = 800) as set by the National Center for Health Statistics. For upper percentile (>75), the minimum sample size (N) satisfies the following rule: $n[8/(1-p)]$. http://www/cdc.gov/nchs/about/major/nhanes/nhanes3/nh3gui.pdf.

N = Number of subjects (women, ages 19 to 65 years).
SD = Standard deviation.
GM = Geometric mean.
GSD = Geometric standard deviation.

Source: Loretz et al. (2006).

Table 17-43. Body Lotion Exposure for Consumers Only (males and females)

Distribution Parameter	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	4.543	0.012	67.869	0.228
Standard Deviation	2.707	0.013	43.866	0.307
Median	4.556	0.023	64.265	0.369
Minimum	0.005	0.000	0.043	0.003
Maximum	21.081	1.264	401.371	46.215
Percentile				
*p*01	0.005	0.000	0.079	0.003
*p*02.5	0.017	0.000	0.250	0.011
*p*05	0.556	0.008	8.066	0.191
*p*10	1.129	0.006	15.055	0.293
*p*20	1.948	0.018	27.535	0.330
*p*30	2.907	0.024	40.763	0.359
*p*40	3.737	0.027	53.072	0.357
*p*50	4.556	0.023	64.265	0.369
*p*60	5.246	0.023	75.114	0.374
*p*70	5.898	0.021	86.751	0.404
*p*80	6.645	0.024	101.024	0.495
*p*90	7.822	0.033	123.227	0.715
*p*92	8.183	0.038	130.177	0.868
*p*94	8.651	0.042	139.085	0.968
*p*95	8.951	0.047	144.797	1.072
*p*96	9.326	0.054	151.892	1.211
*p*97.5	10.191	0.081	167.036	1.559
*p*98	10.655	0.096	174.414	1.768
*p*99	12.261	0.155	198.018	2.888
*p*99.5	13.893	0.221	222.667	4.420
*p*99.9	16.991	0.413	282.959	10.304

Source: Hall et al. (2007).

Table 17-44. Deodorant/Antiperspirant Spray Exposure for Consumers Only (males and females)—Under Arms Only

Value	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	3.478	0.007	49.07	0.13
Standard Deviation	2.051	0.009	31.00	0.22
Median	3.153	0.012	43.52	0.19
Minimum	0.045	0.005	0.59	0.10
Maximum	23.663	1.724	379.03	63.23
Percentile				
*p*01	0.228	0.012	3.08	0.13
*p*02.5	0.373	0.008	5.08	0.12
*p*05	0.598	0.011	8.23	0.16
*p*10	1.135	0.014	15.31	0.20
*p*20	1.951	0.012	25.75	0.17
*p*30	2.425	0.010	32.38	0.17
*p*40	2.796	0.011	37.96	0.17
*p*50	3.153	0.012	43.52	0.19
*p*60	3.548	0.013	49.73	0.22
*p*70	4.049	0.015	57.50	0.27
*p*80	4.804	0.019	68.59	0.32
*p*90	6.095	0.029	87.79	0.49
*p*92	6.477	0.031	93.94	0.58
*p*94	6.955	0.037	101.93	0.71
*p*95	7.262	0.040	107.01	0.81
*p*96	7.645	0.047	113.29	0.91
*p*97.5	8.537	0.064	126.91	1.24
*p*98	9.005	0.076	133.46	1.40
*p*99	10.451	0.107	154.31	1.98
*p*99.5	11.628	0.132	175.01	2.80
*p*99.9	13.843	0.277	222.53	7.29

Source: Hall et al. (2007).

Table 17-45. Deodorant/Antiperspirant Spray Exposure for Consumers Only (male sand females) Using Product Over Torso and Under Arms

Value	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	3.732	0.008	52.47	0.14
Standard Deviation	2.213	0.010	32.94	0.23
Median	3.383	0.012	46.66	0.20
Minimum	0.044	0.005	0.59	0.10
Maximum	24.662	2.057	389.12	66.91
Percentile				
*p*01	0.239	0.014	3.19	0.14
*p*02.5	0.384	0.009	5.30	0.15
*p*05	0.639	0.015	8.80	0.18
*p*10	1.214	0.015	16.47	0.23
*p*20	2.078	0.013	27.71	0.18
*p*30	2.580	0.012	34.76	0.17
*p*40	2.986	0.011	40.73	0.18
*p*50	3.383	0.012	46.66	0.20
*p*60	3.819	0.014	53.26	0.21
*p*70	4.364	0.016	61.50	0.27
*p*80	5.156	0.021	73.25	0.35
*p*90	6.543	0.030	93.70	0.53
*p*92	6.969	0.036	100.24	0.60
*p*94	7.505	0.042	108.70	0.73
*p*95	7.839	0.048	114.08	0.81
*p*96	8.263	0.053	120.73	0.92
*p*97.5	9.213	0.069	135.17	1.24
*p*98	9.711	0.080	142.13	1.42
*p*99	11.263	0.117	164.14	2.31
*p*99.5	12.544	0.157	186.13	3.14
*p*99.9	14.898	0.300	235.47	7.01

Source: Hall et al. (2007).

Table 17-46. Deodorant/Antiperspirant Non-Spray for Consumers Only (males and females)

Value	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	0.898	0.002	12.95	0.04
Standard Deviation	0.494	0.002	7.34	0.05
Median	0.820	0.003	11.77	0.05
Minimum	0.000	0.000	0.00	0.00
Maximum	4.528	0.300	73.91	7.48
Percentile				
*p*01	0.064	0.002	0.90	0.04
*p*02.5	0.123	0.004	1.75	0.05
*p*05	0.221	0.004	3.12	0.06
*p*10	0.363	0.003	5.08	0.05
*p*20	0.509	0.003	7.26	0.05
*p*30	0.617	0.003	8.85	0.05
*p*40	0.718	0.003	10.30	0.05
*p*50	0.820	0.003	11.77	0.05
*p*60	0.934	0.004	13.36	0.05
*p*70	1.068	0.004	15.25	0.07
*p*80	1.238	0.005	17.77	0.08
*p*90	1.509	0.007	22.08	0.12
*p*92	1.598	0.008	23.51	0.14
*p*94	1.722	0.010	25.37	0.17
*p*95	1.806	0.011	26.57	0.19
*p*96	1.912	0.013	28.05	0.21
*p*97.5	2.134	0.016	31.18	0.28
*p*98	2.233	0.017	32.67	0.32
*p*99	2.515	0.025	37.25	0.48
*p*99.5	2.771	0.033	41.93	0.72
*p*99.9	3.426	0.088	52.79	1.63

Source: Hall et al. (2007).

Table 17-47. Lipstick Exposure for Consumers Only (females)

Value	Amount (mg/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	24.61	0.17	0.39	0.00
Standard Deviation	24.05	0.25	0.40	0.01
Median	17.11	0.18	0.26	0.00
Minimum	0.13	0.04	0.00	0.00
Maximum	217.53	26.01	3.88	0.55
Percentile				
*p*01	0.57	0.04	0.01	0.00
*p*02.5	1.00	0.07	0.02	0.00
*p*05	1.68	0.07	0.03	0.00
*p*10	2.95	0.07	0.04	0.00
*p*20	5.69	0.11	0.09	0.00
*p*30	9.20	0.14	0.14	0.00
*p*40	12.93	0.15	0.20	0.00
*p*50	17.11	0.18	0.26	0.00
*p*60	22.37	0.24	0.34	0.00
*p*70	29.43	0.33	0.46	0.01
*p*80	39.70	0.47	0.62	0.01
*p*90	56.53	0.66	0.90	0.01
*p*92	61.66	0.72	0.98	0.01
*p*94	68.29	0.86	1.10	0.02
*p*95	72.51	0.95	1.17	0.02
*p*96	77.78	1.08	1.26	0.02
*p*97.5	89.08	1.34	1.46	0.03
*p*98	94.46	1.52	1.55	0.03
*p*99	110.98	2.06	1.84	0.04
*p*99.5	126.71	2.93	2.13	0.06
*p*99.9	160.06	6.33	2.78	0.14

Source: Hall et al. (2007).

Table 17-48. Facial Moisturizer Exposure for Consumers Only (males and females)

Value	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	0.906	0.003	13.62	0.05
Standard Deviation	0.533	0.004	8.63	0.08
Median	0.851	0.004	12.42	0.06
Minimum	0.001	0.000	0.02	0.00
Maximum	4.751	0.380	92.75	11.80
Percentile				
*p*01	0.055	0.002	0.73	0.04
*p*02.5	0.079	0.004	1.13	0.03
*p*05	0.138	0.001	1.89	0.04
*p*10	0.261	0.004	3.67	0.06
*p*20	0.472	0.004	6.63	0.05
*p*30	0.603	0.003	8.66	0.05
*p*40	0.721	0.003	10.51	0.06
*p*50	0.851	0.004	12.42	0.06
*p*60	0.990	0.004	14.47	0.07
*p*70	1.131	0.004	16.78	0.07
*p*80	1.289	0.005	19.65	0.10
*p*90	1.536	0.007	24.14	0.14
*p*92	1.617	0.008	25.57	0.17
*p*94	1.727	0.010	27.46	0.19
*p*95	1.801	0.012	28.68	0.22
*p*96	1.897	0.014	30.23	0.25
*p*97.5	2.129	0.022	33.73	0.35
*p*98	2.251	0.027	35.52	0.43
*p*99	2.653	0.043	41.63	0.71
*p*99.5	3.040	0.057	48.23	1.08
*p*99.9	3.714	0.108	63.35	2.62

Source: Hall et al. (2007).

Table 17-49. Shampoo Exposure for Consumers Only (males and females)

Value	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	6.034	0.014	85.888	0.223
Standard Deviation	3.296	0.015	48.992	0.278
Median	5.503	0.020	77.895	0.294
Minimum	0.344	0.036	3.826	0.461
Maximum	29.607	0.669	528.361	65.887
Percentile				
*p*01	1.071	0.000	12.781	0.148
*p*02.5	1.268	0.023	16.367	0.181
*p*05	1.482	0.024	21.059	0.182
*p*10	2.178	0.019	29.737	0.269
*p*20	3.236	0.016	44.415	0.242
*p*30	3.843	0.019	55.58	0.253
*p*40	4.777	0.023	66.502	0.27
*p*50	5.503	0.020	77.895	0.294
*p*60	6.416	0.022	90.255	0.332
*p*70	7.390	0.026	104.537	0.373
*p*80	8.597	0.028	122.6	0.461
*p*90	10.456	0.039	150.488	0.642
*p*92	11.013	0.054	159.046	0.73
*p*94	11.721	0.041	169.939	0.846
*p*95	12.181	0.063	176.768	0.922
*p*96	12.705	0.064	185.092	1.08
*p*97.5	13.765	0.073	202.349	1.396
*p*98	14.194	0.091	210.49	1.551
*p*99	15.637	0.110	235.613	2.142
*p*99.5	16.992	0.149	260.624	3.009
*p*99.9	20.397	0.443	320.47	6.689

Source: Hall et al. (2007).

Table 17-50. Toothpaste Exposure for Consumers Only (males and females)

Value	Amount (g/day)	Parameter SD	Amount (mg/kg-day)	Parameter SD
Mean	2.092	0.001	29.85	0.04
Standard Deviation	0.577	0.001	10.34	0.05
Median	2.101	0.003	28.67	0.06
Minimum	0.069	0.012	0.93	0.18
Maximum	4.969	0.159	98.77	8.19
Percentile				
*p*01	0.777	0.011	10.14	0.14
*p*02.5	1.049	0.006	13.34	0.08
*p*05	1.204	0.004	15.47	0.06
*p*10	1.370	0.003	17.96	0.06
*p*20	1.591	0.003	21.29	0.05
*p*30	1.790	0.003	23.94	0.05
*p*40	1.958	0.003	26.32	0.06
*p*50	2.101	0.003	28.67	0.06
*p*60	2.237	0.003	31.15	0.06
*p*70	2.383	0.003	34.00	0.07
*p*80	2.551	0.003	37.62	0.08
*p*90	2.749	0.003	43.29	0.12
*p*92	2.809	0.004	45.03	0.14
*p*94	2.895	0.005	47.23	0.16
*p*95	2.960	0.006	48.61	0.17
*p*96	3.052	0.008	50.27	0.20
*p*97.5	3.323	0.010	53.70	0.25
*p*98	3.447	0.015	55.28	0.26
*p*99	3.760	0.006	60.12	0.39
*p*99.5	3.956	0.026	64.77	0.52
*p*99.9	4.303	0.049	74.84	1.10

Source: Hall et al. (2007).

Table 17-51. Average Number of Applications per Use Day[a]

Summary Statistics	Facial Cleanser (lathering and non-lathering)	Hair Conditioner	Eye Shadow
N	295	297	299
Mean	1.6	1.1	1.2
SD	0.52	0.19	0.33
Minimum	1.0	1.0	1.0
Maximum	3.2	2.4	2.7
Percentiles			
10th	1.0	1.0	1.0
20th	1.0	1.0	1.0
30th	1.2	1.0	1.0
40th	1.4	1.0	1.1
50th	1.7	1.0	1.1
60th	1.9	1.0	1.1
70th	2.0	1.0	1.2
80th	2.0	1.1	1.4
90th	2.2	1.2	1.7
95th	2.4	1.4	2.0
97.5th	2.9[b]	1.8[b]	2.2[b]
99th [b]	3.1[b]	2.1[b]	2.5[b]

[a] Derived as the ratio of the number of applications to the number of use days.

[b] Estimate does not meet the minimum sample size criteria (n = 800) as set by the National Center for Health Statistics. For upper percentile (>0.75), the minimum sample size (n) satisfies the following rule: n [8/(1-p.] See http://www/cdc/gov/nchs/about/major/nhanes/nhanes3/nh3gui.pdf.

N = Number of subjects (women, ages 18 to 69 years).
SD = Standard deviation.

Source: Loretz et al. (2008).

Table 17-52. Average Amount of Product Applied per Use Day (grams)[a]

Summary Statistics	Facial Cleanser (lathering and non-lathering)	Facial Cleanser (lathering)	Facial Cleanser (non-lathering)	Hair Conditioner	Eye Shadow
N	295	174	121	297	299
Mean	4.06	4.07	4.05	13.77	0.04
SD	2.78	2.87	2.67	11.50	0.11
Minimum	0.33	0.33	0.83	0.84	0.001
Maximum	16.70	15.32	16.70	87.86	0.74
Percentiles					
10th	1.41	1.23	1.50	3.71	0.003
20th	1.79	1.72	1.94	5.54	0.005
30th	2.18	2.15	2.22	6.95	0.007
40th	2.66	2.64	2.80	8.73	0.009
50th	3.25	3.19	3.33	10.62	0.010
60th	3.86	3.84	3.88	12.61	0.013
70th	4.62	4.71	4.59	15.54	0.017
80th	6.24	6.33	5.92	20.63	0.025
90th	8.28	8.24	8.40	28.20	0.052
95th	9.93	10.50	9.37[b]	33.19	0.096
97.5th	10.71[b]	11.47[b]	10.26[b]	45.68[b]	0.525[b]
99th [b]	12.44[b]	13.07[b]	15.29[b]	60.20[b]	0.673[b]
Best Fit Distributions and Parameters	Lognormal Distribution GM = 3.26 GSD = 1.12	Lognormal Distribution GM = 3.21 GSD = 2.03	Lognormal Distribution GM = 3.35 GSD = 1.86	Lognormal Distribution GM = 10.28 GSD = 2.20	Lognormal Distribution GM = 0.01 GSD = 3.61
p-value (chi-square test)	0.1251	0.4429	0.4064	0.8595	<0.0001

[a] Derived as the ratio of the total amount used to the number of use days.

[b] Estimate does not meet the minimum sample size criteria (n = 800) as set by the National Center for Health Statistics. For upper percentile (>0.75), the minimum sample size (n) satisfies the following rule: n [8/(1-p)]. See http://www/cdc.gov/nchs/about/major/nhanes/nhanes3/nh3gui.pdf.

N = Number of subjects (women, ages 18 to 69 years).
SD = Standard deviation.
GM = Geometric mean.
GSD = Geometric standard deviation.

Source: Loretz et al. (2008).

Table 17-53. Average Amount of Product Applied per Application (grams)[a]

Summary Statistics	Facial Cleanser (lathering and non-lathering)	Facial Cleanser (lathering)	Facial Cleanser (non-lathering)	Hair Conditioner	Eye Shadow
N	295	174	121	297	299
Mean	2.57	2.56	2.58	13.13	0.03
SD	1.78	1.78	1.77	11.22	0.10
Minimum	0.33	0.33	0.57	0.84	0.0004
Maximum	14.61	10.67	14.61	87.86	0.69
Percentiles					
10th	0.92	0.83	1.10	3.48	0.003
20th	1.32	1.26	1.35	5.34	0.004
30th	1.57	1.55	1.59	6.71	0.006
40th	1.85	1.84	1.89	8.26	0.007
50th	2.11	2.11	2.15	10.21	0.009
60th	2.50	2.50	2.51	12.24	0.011
70th	2.94	2.96	2.96	14.54	0.015
80th	3.47	3.56	3.40	18.88	0.022
90th	4.81	5.10	4.52	27.32	0.041
95th	5.89	6.37	5.11[b]	32.43	0.096
97.5th	7.16[b]	7.77[b]	6.29[b]	45.68[b]	0.488[b]
99thb	9.44[b]	9.61[b]	15.46[b]	60.20[b]	0.562[b]
Best Fit Distributions and Parameters	Extreme Value	Gamma	Extreme Value	Lognormal Distribution	Lognormal Distribution
	Mode = 1.86 Scale = 1.12	Loc = 0.28 Scale = 1.29	Mode = 1.92 Scale = 1.03	GM = 9.78 GSD = 2.20	GM = 0.01 GSD = 3.59
p-value (chi-square test)	0.0464	0.6123	0.5219	0.9501	<0.0001

[a] Derived as the ratio of the total amount used to the total number of applications.

[b] Estimate does not meet the minimum sample size criteria (n = 800) as set by the National Center for Health Statistics. For upper percentile (>0.75), the minimum sample size (n) satisfies the following rule: n [8/(1-p)]. http://www/cdc.gov/nchs/about/major/nhanes/nhanes3/nh3gui.pdf.

N = Number of subjects (women, ages 18 to 69 years).
SD = Standard deviation.
GM = Geometric mean.
GSD = Geometric standard deviation.

Source: Loretz et al. (2008).

Table 17-54. Characteristics of the Study Population and the Percentage Using Selected Baby Care Products

Characteristic	Sample Number (%)
Number of Participants	
Los Angeles, CA	43 (26)
Minneapolis, MN	77 (47)
Columbia, MO	43 (26)
Sex	
Male	84 (52)
Female	79 (48)
Age (months)	
2 to 8	42 (26)
9 to 16	82 (50)
17 to 24	30 (18)
24 to 28	9 (6)
Infant Weight (kg)	
≤10	84 (52)
>10	79 (48)
Race	
White	131 (80)
Hispanic/Latino	17 (10)
Native American	3 (2)
Asian	8 (5)
Black	4 (3)
Product Use	% Using
Baby Lotion	36
Baby Shampoo	54
Baby Powder	14
Diaper Cream	33
Baby Wipes	94

Source: Sathyanarayana et al. (2008)

18. LIFETIME

18.1. INTRODUCTION

The length of an individual's life is an important factor to consider when evaluating cancer risk because the dose estimate is averaged over an individual's lifetime. The recommendations for life expectancy are provided in the next section, along with a summary of the confidence rating for this recommendation. Because the averaging time is found in the denominator of the dose equation, a shorter lifetime would result in a higher potential risk estimate, and, conversely, a longer life expectancy would produce a lower potential risk estimate.

The recommended values are based on one key study identified by the U.S. Environmental Protection Agency (EPA) for this factor. Following the recommendations, the key study is summarized.

18.2. RECOMMENDATIONS

Current data suggest that 78 years would be an appropriate value to reflect the average life expectancy of the general population and is the recommended value. If sex is a factor considered in the assessment, note that the average life expectancy value for females is higher than that for males. It is recommended that the assessor use the appropriate value of 75 years for males and 80 years for females, based on life expectancy data from 2007 (Xu et al., 2010). If race is a consideration in assessing exposure for individuals, note that the life expectancy is longer for Whites than for Blacks. Therefore, assessors are encouraged to use values that most reflect the exposed population. Table 18-1 and Table 18-2 present the recommendations and confidence ratings for life expectancy, respectively.

This recommended value is different than the 70 years commonly assumed for the general population in U.S. EPA risk assessments. The Integrated Risk Information System does not use a 70-year lifetime assumption in the derivation of reference concentration and reference dose, cancer slope factors, or unit risks. Therefore, using a value different than 70 years will not result in an inconsistency with the toxicity data.

Table 18-1. Recommended Values for Expectation of Life at Birth: 2007

Population	Life Expectancy (years)	Source
Total	78	Xu et al. (2010)
Males	75	
Females	80	

Table 18-2. Confidence in Lifetime Expectancy Recommendations

Considerations	Rationale	Rating
Soundness		High
Adequacy of Approach	Recommendations are based on data from death certificates filed in the 50 states in the United States and District of Columbia.	
Minimal (or defined) Bias	There are no apparent biases.	
Applicability and Utility		High
Exposure Factor of Interest	Death certificate data were used to calculate life expectancy for various population groups born between 1940 and 2007.	
Representativeness	The data are representative of the U.S. population.	
Currency	The study was published in 2010 based on data collected in 2007.	
Data Collection Period	Data were collected in 2007.	
Clarity and Completeness		High
Accessibility	The key study is widely available to the public.	
Reproducibility	Results can be reproduced by analyzing death certificate data.	
Quality Assurance	Information on ensuring data quality are available publicly.	
Variability and Uncertainty		Medium
Variability in Population	Data were averaged by sex and race—but only for Blacks and Whites; no other nationalities were represented within the study.	
Uncertainty	Data were based on death certificates filed in the 50 states in the United States and District of Columbia.	
Evaluation and Review		High
Peer Review	Data are published and have been peer reviewed.	
Number and Agreement of Studies	Recommendations for expectation of life at birth were based on only one study.	
Overall Rating		**High**

18.3. KEY LIFETIME STUDY

18.3.1. Xu et al. (2010)—Deaths: Final Data for 2007

Xu et al. (2010) used information compiled from death certificates filed in the 50 states of the United States and District of Columbia and calculated life expectancy for various population groups born between 1940 and 2007. "Life expectancy at birth represents the average number of years that a group of infants would live if the group was to experience throughout life the age-specific death rates present in the year of birth" (Xu et al., 2010).

Table 18-3 shows life expectancy data by sex, age, and race (i.e., Whites and Blacks). Although data for other ethnic groups were collected, they were not considered as reliable because of inconsistencies between the race reported in the death certificates and in the censuses and surveys. Data for 2007 show that the life expectancy for an average person born in the United States is 77.9 years (Xu et al., 2010). The average life expectancy for males in 2007 was 75.4 years and 80.4 years for females. Whereas the gap between males and females was about 7 years in 1970, it has now narrowed to about 5 years. Table 18-3 also indicates that life expectancy for White males and females is consistently longer than for Black males and females. Table 18-4 presents data for the expectation of life for persons at a specific age in year 2007 (Xu et al., 2010). The advantages of this study are that it is representative of the United States and provides life expectancy data based on death certificates and calculations of death rates. A disadvantage is that the data were averaged by sex and race—but only for Blacks and Whites.

18.4. RELEVANT LIFETIME STUDY

18.4.1. U.S. Census Bureau (2008)—U.S. Population Projections: Projected Life Expectancy at Birth by Sex, Race, and Hispanic Origin for the United States: 2010 to 2050

Statistical data on life expectancy are published annually by the U.S. Department of Commerce in the publication, *Statistical Abstract of the United States*. Data are collected for the 50 states and the District of Columbia. The *Statistical Abstract of the United States* has been published by the U.S. Census Bureau since 1878 (U.S. Census Bureau, 2010). The U.S. Census Bureau (2008) computed life expectancy projections for 2010 through 2050, by decade. This analysis uses historical mortality trend data collected by the National Center for Health Statistics and applies forecast models to estimate projected life expectancy at birth. These data are provided, by sex and race in Table 18-5.

The advantage of this survey is that it is representative of the United States, and it provides projections by sex and race. A disadvantage is that life expectancy estimates are based on future projections.

18.5. REFERENCES FOR CHAPTER 18

U.S. Census Bureau. (2008). U.S. population projections: Table 10. Projected life expectancy at birth by sex, race, and Hispanic origin for the United States: 2010 to 2050. (NP2008-T10). Washington, DC. http://www.census.gov/population/www/projections/summarytables.html.

U.S. Census Bureau. (2010). The 2010 statistical abstract. http://www.census.gov/compendia/statab/2010.

Xu, JQ; Kochanek, KD; Murphy, SL; Tejada-Vera, B. (2010). Deaths: Final Data for 2007. Hyattsville, MD: National Center for Health Statistics. http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf.

Table 18-3. Expectation of Life at Birth, 1970 to 2007 (years)[a]

Year[b]	Total			White			Black		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
1970	70.8	67.1	74.7	71.7	68.0	75.6	64.1	60.0	68.3
1975	72.6	68.8	76.6	73.4	69.5	77.3	66.8	62.4	71.3
1980	73.7	70.0	77.4	74.4	70.7	78.1	68.1	63.8	72.5
1982	74.5	70.8	78.1	75.1	71.5	78.7	69.4	65.1	73.6
1983	74.6	71.0	78.1	75.2	71.6	78.7	69.4	65.2	73.5
1984	74.7	71.1	78.2	75.3	71.8	78.7	69.5	65.3	73.6
1985	74.7	71.1	78.2	75.3	71.8	78.7	69.3	65.0	73.4
1986	74.7	71.2	78.2	75.4	71.9	78.8	69.1	64.8	73.4
1987	74.9	71.4	78.3	75.6	72.1	78.9	69.1	64.7	73.4
1988	74.9	71.4	78.3	75.6	72.2	78.9	68.9	64.4	73.2
1989	75.1	71.7	78.5	75.9	72.5	79.2	68.8	64.3	73.3
1990	75.4	71.8	78.8	76.1	72.7	79.4	69.1	64.5	73.6
1991	75.5	72.0	78.9	76.3	72.9	79.6	69.3	64.6	73.8
1992	75.8	72.3	79.1	76.5	73.2	79.8	69.6	65.0	73.9
1993	75.5	72.2	78.8	76.3	73.1	79.5	69.2	64.6	73.7
1994	75.7	72.4	79.0	76.5	73.3	79.6	69.5	64.9	73.9
1995	75.8	72.5	78.9	76.5	73.4	79.6	69.6	65.2	73.9
1996	76.1	73.1	79.1	76.8	73.9	79.7	70.2	66.1	74.2
1997	76.5	73.6	79.4	77.2	74.3	79.9	71.1	67.2	74.7
1998	76.7	73.8	79.5	77.3	74.5	80.0	71.3	67.6	74.8
1999	76.7	73.9	79.4	77.3	74.6	79.9	71.4	67.8	74.7
2000	76.8	74.1	79.3	77.3	74.7	79.9	71.8	68.2	75.1
2001	76.9	74.2	79.4	77.4	74.8	79.9	72.0	68.4	75.2
2002	76.9	74.3	79.5	77.4	74.9	79.9	72.1	68.6	75.4
2003	77.1	74.5	79.6	77.6	75.0	80.0	72.3	68.8	75.6
2004	77.5	74.9	79.9	77.9	75.4	80.4	72.8	69.3	76.0
2005	77.4	74.9	79.9	77.9	75.4	80.4	72.8	69.3	76.1
2006	77.7	75.1	80.2	78.2	75.7	80.6	73.2	69.7	76.5
2007	77.9	75.4	80.4	78.4	75.9	80.8	73.6	70.0	76.8

[a] Based on middle mortality assumptions; for details, source: U.S. Census Bureau (2008).

[b] Life expectancies for 2000–2007 were calculated using a revised methodology and may differ from those previously published; see Xu et al. (2010).

Source: Xu et al. (2010).

Table 18-4. Expectation of Life by Race, Sex, and Age: 2007

Exact Age in Years	All Races[a]			White			Black		
	Both Sexes	Males	Females	Both Sexes	Males	Females	Both Sexes	Males	Females
0	77.9	75.4	80.4	78.4	75.9	80.8	73.6	70.0	76.8
1	77.5	74.9	79.9	77.8	75.4	80.2	73.6	70.1	76.8
5	73.6	71.0	76.0	73.9	71.4	76.3	69.7	66.2	72.9
10	68.6	66.1	71.0	68.9	66.5	71.3	64.7	61.3	67.9
15	63.7	61.1	66.1	64.0	61.6	66.3	59.8	56.3	63.0
20	58.8	56.4	61.2	59.2	56.8	61.5	55.1	51.7	58.1
25	54.1	51.8	56.3	54.4	52.2	56.6	50.4	47.2	53.3
30	49.4	47.1	51.5	49.7	47.5	51.7	45.8	42.7	48.5
35	44.6	42.5	46.7	44.9	42.8	46.9	41.2	38.2	43.8
40	39.9	37.8	41.9	40.2	38.1	42.1	36.7	33.8	39.1
45	35.4	33.3	37.2	35.6	33.6	37.4	32.3	29.5	34.7
50	30.9	29.0	32.7	31.1	29.2	32.8	28.1	25.4	30.4
55	26.7	24.9	28.2	26.8	25.1	28.4	24.2	21.7	26.3
60	22.5	20.9	23.9	22.6	21.0	24.0	20.6	18.3	22.4
65	18.6	17.2	19.9	18.7	17.3	19.9	17.2	15.2	18.7
70	15.0	13.7	16.0	15.0	13.8	16.0	14.1	12.4	15.2
75	11.7	10.6	12.5	11.7	10.6	12.4	11.2	9.9	12.1
80	8.8	7.9	9.4	8.8	7.9	9.3	8.7	7.7	9.4
85	6.5	5.8	6.8	6.4	5.7	6.8	6.7	6.0	7.1
90	4.6	4.1	4.8	4.6	4.1	4.8	5.1	4.6	5.3
95	3.2	2.9	3.3	3.2	2.9	3.3	3.8	3.5	3.9
100	2.3	2.1	2.3	2.2	2.0	2.2	2.8	2.6	2.8

[a] Includes races other than White and Black.

Source: Xu et al. (2010).

Table 18-5. Projected Life Expectancy at Birth by Sex, Race, and Hispanic Origin for the United States: 2010 to 2050

Sex, Race, and Hispanic Origin	2010	2020	2030	2040	2050
Males and Females Combined					
Total Population	78.3	79.5	80.7	81.9	83.1
White	78.9	80.0	81.1	82.2	83.3
Black	73.8	76.1	78.1	80.0	81.8
American Indian and Alaskan Native	79.1	80.2	81.3	82.3	83.4
Asian	78.8	80.0	81.1	82.2	83.3
Native Hawaii or Pacific Islander	79.2	80.2	81.2	82.4	83.4
Two or more races	79.4	80.5	81.5	82.4	83.4
Non-Hispanic White alone	78.7	79.8	80.9	82.0	83.1
Hispanic[a]	81.1	81.8	82.6	83.3	84.1
Males					
Total Population	75.7	77.1	78.4	79.6	80.9
White	76.5	77.7	78.9	80.0	81.2
Black	70.2	72.6	74.9	77.1	79.1
American Indian and Alaskan Native	76.6	77.8	79.0	80.1	81.2
Asian	76.3	77.5	78.7	79.8	81.0
Native Hawaii or Pacific Islander	76.8	77.8	79.0	80.1	81.2
Two or more races	77.0	78.1	79.1	80.2	81.2
Non-Hispanic White alone	76.3	77.5	78.7	79.8	81.0
Hispanic[a]	78.4	79.3	80.2	81.0	81.8
Females					
Total Population	80.8	81.9	83.1	84.2	85.3
White	81.3	82.4	83.4	84.5	85.5
Black	77.2	79.2	81.0	82.7	84.3
American Indian and Alaskan Native	81.5	82.5	83.6	84.5	85.5
Asian	81.1	82.2	83.2	84.2	85.3
Native Hawaii or Pacific Islander	81.6	82.6	83.5	84.5	85.5
Two or more races	81.7	82.7	83.6	84.6	85.5
Non-Hispanic White alone	81.1	82.1	83.2	84.2	85.2
Hispanic[a]	83.7	84.4	85.0	85.6	86.3

[a] Hispanics may be of any race.

Source: U.S. Census Bureau (2008).

19. BUILDING CHARACTERISTICS

19.1. INTRODUCTION

Unlike previous chapters in this handbook, which focus on human behavior or characteristics that affect exposure, this chapter focuses on building characteristics. Assessment of exposure in indoor settings requires information on the availability of the chemical(s) of concern at the point of exposure, characteristics of the structure and microenvironment that affect exposure, and human presence within the building. The purpose of this chapter is to provide data that are available on building characteristics that affect exposure in an indoor environment. This chapter addresses residential and non-residential building characteristics (volumes, surface areas, mechanical systems, and types of foundations), transport phenomena that affect chemical transport within a building (airflow, chemical-specific deposition and filtration, and soil tracking), and information on various types of indoor building-related sources associated with airborne exposure and soil/house dust sources. Source-receptor relationships in indoor exposure scenarios can be complex due to interactions among sources, and transport/transformation processes that result from chemical-specific and building-specific factors.

There are many factors that affect indoor air exposures. Indoor air models generally require data on several parameters. This chapter provides recommendations on two parameters, volume and air exchange rates. Other factors that affect indoor air quality are furnishings, siting, weather, ventilation and infiltration, environmental control systems, material durability, operation and maintenance, occupants and their activities, and building structure. Available relevant information on some of these other factors is provided in this chapter, but specific recommendations are not provided, as site-specific parameters are preferred.

Figure 19-1 illustrates the complex factors that must be considered when conducting exposure assessments in an indoor setting. In addition to sources within the building, chemicals of concern may enter the indoor environment from outdoor air, soil, gas, water supply, tracked-in soil, and industrial work clothes worn by the residents. Indoor concentrations are affected by loss mechanisms, also illustrated in Figure 19-1, involving chemical reactions, deposition to and re-emission from surfaces, and transport out of the building. Particle-bound chemicals can enter indoor air through resuspension. Indoor air concentrations of gas-phase organic chemicals are affected by the presence of reversible sinks formed by a wide range of indoor materials. In addition, the activity of human receptors greatly affects their exposure as they move from room to room, entering and leaving the exposure scene.

Inhalation exposure assessments in indoor settings are modeled by considering the building as an assemblage of one or more well-mixed zones. A zone is defined as one room, a group of interconnected rooms, or an entire building. At this macroscopic level, well-mixed assumptions form the basis for interpretation of measurement data as well as simulation of hypothetical scenarios. Exposure assessment models on a macroscopic level incorporate important physical factors and processes. These well-mixed, macroscopic models have been used to perform indoor air quality simulations (Axley, 1989), as well as indoor air exposure assessments (Ryan, 1991; Mckone, 1989). Nazaroff and Cass (1986) and Wilkes et al. (1992) have used computer programs featuring finite difference or finite element numerical techniques to model mass balance. A simplified approach using desktop spreadsheet programs has been used by U.S. Environmental Protection Agency (EPA) (1990b). EPA has created two useful indoor air quality models: the (I-BEAM) (http://www.epa.gov/iaq/largebldgs/i-beam/index.html), which estimates indoor air quality in commercial buildings and the *Multi-Chamber Concentration and Exposure Model* (MCCEM) (http://www.epa.gov/opptintr/exposure/pubs/mccem.htm), which estimates average and peak indoor air concentrations of chemicals released from residences.

Major air transport pathways for airborne substances in buildings include the following:

- Air exchange—Air leakage through windows, doorways, intakes and exhausts, and "adventitious openings" (i.e., cracks and seams) that combine to form the leakage configuration of the building envelope plus natural and mechanical ventilation;
- Interzonal airflows—Transport through doorways, ductwork, and service chaseways that interconnect rooms or zones within a building; and
- Local circulation—Convective and advective air circulation and mixing within a room or within a zone.

The air exchange rate is generally expressed in terms of air changes per hour (ACH), with units of

($hour^{-1}$). It is defined as the ratio of the airflow ($m^3\ hour^{-1}$) to the volume (m^3). The distribution of airflows across the building envelope that contributes to air exchange and the interzonal airflows along interior flowpaths is determined by the interior pressure distribution. The forces causing the airflows are temperature differences, the actions of wind, and mechanical ventilation systems. Basic concepts on distributions and airflows have been reviewed by the American Society of Heating Refrigerating & Air Conditioning Engineers (ASHRAE, 2009). Indoor-outdoor and room-to-room temperature differences create density differences that help determine basic patterns of air motion. During the heating season, warmer indoor air tends to rise to exit the building at upper levels by stack action. Exiting air is replaced at lower levels by an influx of colder outdoor air. During the cooling season, this pattern is reversed: stack forces during the cooling season are generally not as strong as in the heating season because the indoor-outdoor temperature differences are not as pronounced.

The position of the neutral pressure level (i.e., the point where indoor-outdoor pressures are equal) depends on the leakage configuration of the building envelope. The stack effect arising from indoor-outdoor temperature differences is also influenced by the partitioning of the building interior. When there is free communication between floors or stories, the building behaves as a single volume affected by a generally rising current during the heating season and a generally falling current during the cooling season. When vertical communication is restricted, each level essentially becomes an independent zone. As the wind flows past a building, regions of positive and negative pressure (relative to indoors) are created within the building; positive pressures induce an influx of air, whereas negative pressures induce an outflow. Wind effects and stack effects combine to determine a net inflow or outflow.

The final element of indoor transport involves the actions of mechanical ventilation systems that circulate indoor air through the use of fans. Mechanical ventilation systems may be connected to heating/cooling systems that, depending on the type of building, recirculate thermally treated indoor air or a mixture of fresh air and recirculated air. Mechanical systems also may be solely dedicated to exhausting air from a designated area, as with some kitchen range hoods and bath exhausts, or to recirculating air in designated areas as with a room fan. Local air circulation also is influenced by the movement of people and the operation of local heat sources.

19.2. RECOMMENDATIONS

Table 19-1 presents the recommendations for residential building volumes and air exchange rates. Table 19-2 presents the confidence ratings for the recommended residential building volumes. The U.S. EPA 2010 analysis of the 2005 Residential Energy Consumption Survey (RECS) data indicates a 492 m^3 average living space (DOE, 2008a). However, these values vary depending on the type of housing (see Section 19.3.1.1). The recommended lower end of housing volume is 154 m^3. Other percentiles are available in Section 19.3.1.1. Residential air exchange rates vary by region of the country. The recommended median air exchange rate for all regions combined is 0.45 ACH. The arithmetic mean is not preferred because it is influenced fairly heavily by extreme values at the upper tail of the distribution. This value was derived by Koontz and Rector (1995) using the perflourocarbon tracer (PFT) database. Section 19.5.1.1.1 presents distributions for the various regions of the country. For a conservative value, the 10^{th} percentile for the PFT database (0.18 ACH) is recommended (see Section 19.5.1.1.1).

Table 19-3 presents the recommended values for non-residential building volumes and air exchange rates. Volumes of non-residential buildings vary with type of building (e.g., office space, malls). They range from 1,889 m^3 for food services to 287,978 m^3 for enclosed malls. The mean for all buildings combined is 5,575 m^3. These data come from the Commercial Buildings Energy Consumption Survey (CBECS) (DOE, 2008b). The last CBECS for which data are publicly available was conducted in 2003. Table 19-4 presents the confidence ratings for the non-residential building volume recommendations. The mean air exchange rate for all non-residential buildings combined is 1.5 ACH. The 10^{th} percentile air exchange rate for all buildings combined is 0.60 ACH. These data come from Turk et al. (1987).

Table 19-5 presents the confidence ratings for the air exchange rate recommendations for both residential and non-residential buildings. Air exchange rate data presented in the studies are extremely limited. Therefore, the recommended values have been assigned a "low" overall confidence rating, and these values should be used with caution.

Volume and air exchange rates can be used by exposure assessors in modeling indoor-air concentrations as one of the inputs to exposure estimation. Other inputs to the modeling effort include rates of indoor pollutant generation and losses to (and, in some cases, re-emissions from) indoor sinks. Other things being equal (i.e., holding constant the pollutant generation rate and effect of

indoor sinks), lower values for either the indoor volume or the air exchange rate will result in higher indoor-air concentrations. Thus, values near the lower end of the distribution (e.g., 10th percentile) for either parameter are appropriate in developing conservative estimates of exposure.

There are some uncertainties in, or limitations on, the distribution for volumes and air exchange rates that are presented in this chapter. For example, the RECS contains information on floor area rather than total volume. The PFT database did not base its measurements on a sample that was statistically representative of the national housing stock. PFT has been found to underpredict seasonal average air exchange by 20 to 30% Sherman (1989). Using PFT to determine air exchange can produce significant errors when conditions during the measurements greatly deviate from idealizations calling for constant, well-mixed conditions. Principal concerns focus on the effects of naturally varying air exchange and the effects of temperature in the permeation source. Some researchers have found that failing to use a time-weighted average temperature can greatly affect air exchange rate estimates (Leaderer et al., 1985). A final difficulty in estimating air exchange rates for any particular zone results from interconnectedness of multi-zone models and the effect of neighboring zones as demonstrated by Sinden (1978) and Sandberg (1984).

Table 19-1. Summary of Recommended Values for Residential Building Parameters

	Mean	10th Percentile	Source
Volume of Residence[a]	492 m^3 (central estimate)[b]	154 m^3 (lower percentile)[c]	U.S. EPA 2010 analysis of U.S. DOE (2008a)
Air Exchange Rate	0.45 ACH (central estimate)[d]	0.18 ACH (lower percentile)[e]	Koontz and Rector (1995)

[a] Volumes vary with type of housing. For specific housing type volumes, see Table 19-6.
[b] Mean value presented in Table 19-6 recommended for use as a central estimate for all single family homes, including mobile homes and multifamily units.
[c] 10th percentile value from Table 19-8 recommended to be used as a lower percentile estimate.
[d] Median value recommended to be used as a central estimate based across all U.S. census regions (see Table 19-24).
[e] 10th percentile value across all U.S. census regions recommended to be used as a lower percentile value (see Table 19-24).
ACH = Air changes per hour.

Table 19-2. Confidence in Residential Volume Recommendations

General Assessment Factors	Rationale	Rating
Soundness		Medium
Adequacy of Approach	The study was based on primary data. Volumes were estimated assuming an 8-foot ceiling height. The effect of this assumption has been tested by Murray (1997) and found to be insignificant.	
Minimal (or defined) Bias	Selection of residences was random.	
Applicability and Utility		Medium
Exposure Factor of Interest	The focus of the studies was on estimating house volume as well as other factors.	
Representativeness	Residences in the United States were the focus of the study. The sample size was fairly large and representative of the entire United States. Samples were selected at random.	
Currency	The most recent RECS survey was conducted in 2005.	
Data Collection Period	Data were collected in 2005.	
Clarity and Completeness		High
Accessibility	The RECS database is publicly available.	
Reproducibility	Direct measurements were made.	
Quality Assurance	Not applicable.	
Variability and Uncertainty		Medium
Variability in Population	Distributions are presented by housing type and regions, but some subcategory sample sizes were small.	
Uncertainty	Although residence volumes were estimated using the assumption of 8-foot ceiling height, Murray (1997) found this assumption to have minimal impact.	
Evaluation and Review		Medium
Peer Review	The RECS database is publicly available. Some data analysis was conducted by U.S. EPA.	
Number and Agreement of Studies	Only one study was used to derive recommendations. Other relevant studies provide supporting evidence.	
Overall Rating	.	**Medium**

Table 19-3. Summary of Recommended Values for Non-Residential Building Parameters

	Mean[a]	10th Percentile[b]	Source
Volume of Building (m^3)[c]			
Vacant	4,789	408	U.S. EPA analysis of U.S. DOE (2008b)
Office	5,036	510	
Laboratory	24,681	2,039	
Non-refrigerated warehouse	9,298	1,019	
Food sales	1,889	476	
Public order and safety	5,253	816	
Outpatient healthcare	3,537	680	
Refrigerated warehouse	19,716	1,133	
Religious worship	3,443	612	
Public assembly	4,839	595	
Education	8,694	527	
Food service	1,889	442	
Inpatient healthcare	82,034	17,330	
Nursing	15,522	1,546	
Lodging	11,559	527	
Strip shopping mall	7,891	1,359	
Enclosed mall	287,978	35,679	
Retail other than mall	3,310	510	
Service	2,213	459	
Other	5,236	425	
All Buildings[d]	5,575	527	
Air Exchange Rate[e]	Mean (SD)1.5 (0.87) ACH Range 0.3–4.1 ACH	0.60 ACH	Turk et al. (1987)

[a] Mean values are recommended as central estimates for non-residential buildings (see Table 19-20).
[b] 10th percentile values are recommended as lower estimates for non-residential buildings (see Table 19-20).
[c] Volumes were calculated assuming a ceiling height of 20 feet for warehouses and enclosed malls and 12 feet for other structures (see Table 19-20).
[d] Weighted average assuming a ceiling height of 20 feet for warehouses and enclosed malls and 12 feet for other structures (see Table 19-20).
[e] Air exchange rates for commercial buildings (see Table 19-27).
SD = Standard deviation.
ACH = Air changes per hour.

Table 19-4. Confidence in Non-Residential Volume Recommendations

General Assessment Factors	Rationale	Rating
Soundness		Medium
Adequacy of Approach	All non-residential data were based on one study: CBECS (DOE, 2008b). Volumes were estimated assuming a 20-foot ceiling height assumption for warehouses and a 12-foot height assumption for all other non-residential buildings based on scant anecdotal information. Although Murray (1997) found that the impact of an 8-foot ceiling assumption was insignificant for residential structures, the impact of these ceiling height assumptions for non-residential buildings is unknown.	
Minimal (or defined) Bias	Selection of residences was random for CBECS.	
Applicability and Utility		High
Exposure Factor of Interest	CBECS (DOE, 2008b) contained ample building size data, which were used as the basis provided for volume estimates.	
Representativeness	CBECS (DOE, 2008b) was a nationwide study that generated weighted nationwide data based upon a large random sample.	
Currency, Data Collection Period	The data were collected in 2003.	
Clarity and Completeness		High
Accessibility	The data are available online in both summary tables and raw data. http://www.eia.doe.gov/emeu/cbecs/contents.html	
Reproducibility	Direct measurements were made.	
Quality Assurance	Not applicable.	
Variability and Uncertainty		Medium
Variability in Population	Distributions are presented by building type, heating and cooling system type, and employment, but a few subcategory sample sizes were small.	
Uncertainty	Volumes were calculated using speculative assumptions for building height. The impact of such assumptions may or may not be significant.	
Evaluation and Review		Low
Peer Review	There are no studies from the peer-reviewed literature.	
Number and Agreement of Studies	All data are based upon one study: CBECS (DOE, 2008b).	
Overall Rating	.	**Medium**

Table 19-5. Confidence in Air Exchange Rate Recommendations for Residential and Non-Residential Buildings

General Assessment Factors	Rationale	Rating
Soundness		Low
Adequacy of Approach	The studies were based on primary data; however, most approaches contained major limitations, such as assuming uniform mixing, and residences were typically not selected at random.	
Minimal (or defined) Bias	Bias may result because the selection of residences and buildings was not random. The commercial building study (Turk et al., 1987) was conducted only on buildings in the northwest United States.	
Applicability and Utility		Low
Exposure Factor of Interest	The focus of the studies was on estimating air exchange rates as well as other factors.	
Representativeness	Study residences were typically in the United States, but only RECS (DOE, 2008a) selected residences randomly. PFT residences were not representative of the United States. Distributions are presented by housing type and regions; although some of the sample sizes for the subcategories were small. The commercial building study (Turk et al., 1987) was conducted only on buildings in the northwest United States.	
Currency	Measurements in the PFT database were taken between 1982–1987. The Turk et al. (1987) study was conducted in the mid-1980s.	
Data Collection Period	Only short-term data were collected; some residences were measured during different seasons; however, long-term air exchange rates are not well characterized. Individual commercial buildings were measured during one season.	
Clarity and Completeness		Medium
Accessibility	Papers are widely available from government reports and peer-reviewed journals.	
Reproducibility	Precision across repeat analyses has been documented to be acceptable.	
Quality Assurance	Not applicable.	
Variability and Uncertainty		Medium
Variability in Population	For the residential estimates, distributions are presented by U.S. regions, seasons, and climatic regions, but some of the sample sizes for the subcategories were small. The commercial estimate comes from buildings in the northwest U.S. representing two climate zones, and measurements were taken in three seasons (spring, summer, and winter).	
Uncertainty	Some measurement error may exist. Additionally, PFT has been found to underpredict seasonal average air exchange by 20–30% (Sherman, 1989). Turk et al. (1987) estimates a 10–20% measurement error for the technique used to measure ventilation in commercial buildings.	

Table 19-5. Confidence in Air Exchange Rate Recommendations for Residential and Non-Residential Buildings (continued)

General Assessment Factors	Rationale	Rating
Evaluation and Review		Low
Peer Review	The studies appear in peer-reviewed literature.	
Number and Agreement of Studies	Three residential studies are based on the same PFT database. The database contains results of 20 projects of varying scope. The commercial building rate is based on one study.	
Overall Rating		**Low**

19.3. RESIDENTIAL BUILDING CHARACTERISTICS STUDIES

19.3.1. Key Study of Volumes of Residences

19.3.1.1. *U.S. DOE (2008a)—Residential Energy Consumption Survey (RECS)*

Measurement surveys have not been conducted to directly characterize the range and distribution of volumes for a random sample of U.S. residences. Related data, however, are regularly collected through the U.S. Department of Energy's (DOE) RECS. In addition to collecting information on energy use, this triennial survey collects data on housing characteristics including direct measurements of total and heated floor space for buildings visited by survey specialists. For the most recent survey done in 2005, a multistage probability sample of 4,381 residences was surveyed, representing 111 million housing units nationwide. The 2005 survey response rate was 77.1%. Volumes were estimated from the RECS measurements by multiplying the heated floor space area by an assumed ceiling height of 8 feet. The data and data tables were released to the public in 2008.

In 2010, the U.S. EPA conducted an analysis of the RECS 2005 survey data. Table 19-6 and Table 19-7 present results for residential volume distributions by type of residence, ownership, and year of construction from the 2005 RECS. Table 19-6 provides information on average estimated residential volumes according to housing type and ownership. The predominant housing type—single-family detached homes—also had the largest average volume. Multifamily units and mobile homes had volumes averaging about half that of single-family detached homes, with single-family attached homes about halfway between these extremes. Within each category of housing type, owner-occupied residences averaged about 50% greater volume than rental units. Data on the relationship of residential volume to year of construction are provided in Table 19-7 and indicate a slight decrease in residential volumes between 1950 and 1979, followed by an increasing trend. A ceiling height of 8 feet was assumed in estimating the average volumes, whereas there may have been some time-related trends in ceiling height. Table 19-8 presents distributions of residential volumes for all house types and all units. The average house volume for all types of units for all years was estimated to be 492 m^3.

It is important to note that in 2005, the RECS changed the way it calculated total square footage. The total average square footage per housing unit for the 2001 RECS was reported as 1,975 ft^2. This figure excluded unheated garages, and for most housing units, living space in attics. The average total square footage for housing units in the 2005 RECS was 2,171 ft^2 (i.e., 492 m^3 converted to ft^3 and assuming an 8-foot ceiling; see Table 19-7), which includes attic living space for all housing units. The only available figures that permit comparison of total square footage for both survey years would exclude all garage floorspace and attic floorspace in all housing units—for 2001, the average total square footage was 2,005, and for 2005, the average total was 2,029 ft^2.

The advantages of this study were that the sample size was large, and it was representative of houses in the United States. Also, it included various housing types. A limitation of this analysis is that volumes were estimated assuming a ceiling height of 8 feet. Volumes of individual rooms in the house cannot be estimated.

19.3.2. Relevant Studies of Volumes of Residences

19.3.2.1. *Versar (1990)—Database on Perfluorocarbon Tracer (PFT) Ventilation Measurements*

Versar (1990) compiled a database of time-averaged air exchange and interzonal airflow measurements in more than 4,000 residences. These data were collected between 1982 and 1987. The residences that appear in this database are not a random sample of U.S. homes. However, they represent a compilation of homes visited in about 100 different field studies, some of which involved random sampling. In each study, the house volumes were directly measured or estimated. The collective homes visited in these field projects are not geographically balanced. A large fraction of these homes are located in southern California. Statistical weighting techniques were applied in developing estimates of nationwide distributions to compensate for the geographic imbalance. The Versar (1990) PFT database found a mean value of 369 m^3 (see Table 19-9).

The advantage of this study is that it provides a distribution of house volumes. However, more up-to-date data are available from RECS 2005 (DOE, 2008a).

19.3.2.2. *Murray (1997)—Analysis of RECS and PFT Databases*

Using a database from the 1993 RECS and an assumed ceiling height of 8 feet, Murray (1997) estimated a mean residential volume of 382 m^3 using

RECS estimates of heated floor space. This estimate is slightly different from the mean of 369 m3 given in Table 19-9. Murray's (1997) sensitivity analysis indicated that when a fixed ceiling height of 8 feet was replaced with a randomly varying height with a mean of 8 feet, there was little effect on the standard deviation of the estimated distribution. From a separate analysis of the PFT database, based on 1,751 individual household measurements, Murray (1997) estimated an average volume of 369 m^3, the same as previously given in Table 19-9. In performing this analysis, the author carefully reviewed the PFT database in an effort to use each residence only once, for those residences thought to have multiple PFT measurements.

Murray (1997) analyzed the distribution of selected residential zones (i.e., a series of connected rooms) using the PFT database. The author analyzed the "kitchen zone" and the "bedroom zone" for houses in the Los Angeles area that were labeled in this manner by field researchers, and "basement," "first floor," and "second floor" zones for houses outside of Los Angeles for which the researchers labeled individual floors as zones. The kitchen zone contained the kitchen in addition to any of the following associated spaces: utility room, dining room, living room, and family room. The bedroom zone contained all the bedrooms plus any bathrooms and hallways associated with the bedrooms. The following summary statistics (mean ± standard deviation) were reported by Murray (1997) for the volumes of the zones described above: 199 ± 115 m^3 for the kitchen zone, 128 ± 67 m^3 for the bedroom zone, 205 ± 64 m^3 for the basement, 233 ± 72 m^3 for the first floor, and 233 ± 111 m^3 for the second floor.

The advantage of this study is that the data are representative of homes in the United States. However, more up-to-date data are available from the RECS 2005 (DOE, 2008a).

19.3.2.3. *U.S. Census Bureau (2009)—American Housing Survey for the United States: 2009*

The American Housing Survey (AHS) is conducted by the Census Bureau for the Department of Housing and Urban Development. It collects data on the Nation's housing, including apartments, single-family homes, mobile homes, vacant housing units, household characteristics, housing quality, foundation type, drinking water source, equipment and fuels, and housing unit size. National data are collected in odd-numbered years, and data for each of 47 selected Metropolitan Areas are collected about every 6 years. The national sample includes about 55,000 housing units. Each metropolitan area samples 4,100 or more housing units. The AHS returns to the same housing units year after year to gather data. The U.S. Census Bureau (2009) lists the number of residential single detached and manufactured/mobile homes in the United States within various categories including seasonal, year-round occupied, and new in the last 4 years, based on the AHS (see Table 19-10). Assuming an 8-foot ceiling, these units have a median size of 385 m^3; however, these values do not include multifamily units. It should be mentioned that 8 feet is the most common ceiling height, and Murray (1997) has shown that the effect of the 8-foot ceiling height assumption is not significant.

The advantage of this study is that it was a large national sample and, therefore, representative of the United States. The limitations of these data are that distributions were not provided by the authors, and the analysis did not include multifamily units.

19.3.3. Other Factors

19.3.3.1. *Surface Area and Room Volumes*

The surface areas of floors are commonly considered in relation to the room or house volume, and their relative loadings are expressed as a surface area-to-volume, or loading ratio. Table 19-11 provides the basis for calculating loading ratios for typical-sized rooms. Constant features in the examples are a room width of 12 feet and a ceiling height of 8 feet (typical for residential buildings), or a ceiling height of 12 feet (typical for some types of commercial buildings).

Volumes of individual rooms are dependent on the building size and configuration, but summary data are not readily available. The exposure assessor is advised to define specific rooms, or assemblies of rooms, that best fit the scenario of interest. Most models for predicting indoor air concentrations specify airflows in m^3 per hour and, correspondingly, express volumes in m^3. A measurement in ft^3 can be converted to m^3 by multiplying the value in ft^3 by 0.0283 m^3/ft^3. For example, a bedroom that is 9 feet wide by 12 feet long by 8 feet high has a volume of 864 ft^3 or 24.5 m^3. Similarly, a living room with dimensions of 12 feet wide by 20 feet long by 8 feet high has a volume of 1,920 ft^3 or 54.3 m^3, and a bathroom with dimensions of 5 feet by 12 feet by 8 feet has a volume of 480 ft^3 or 13.6 m^3.

19.3.3.2. *Products and Materials*

Table 19-12 presents examples of assumed amounts of selected products and materials used in

constructing or finishing residential surfaces (Tucker, 1991). Products used for floor surfaces include adhesive, varnish, and wood stain; and materials used for walls include paneling, painted gypsum board, and wallpaper. Particleboard and chipboard are commonly used for interior furnishings such as shelves or cabinets but could also be used for decking or underlayment. It should be noted that numbers presented in the table for surface area are based on typical values for residences, and they are presented as examples. In contrast to the concept of loading ratios presented above (as a surface area), the numbers in the table also are not scaled to any particular residential volume. In some cases, it may be preferable for the exposure assessor to use professional judgment in combination with the loading ratios given above. For example, if the exposure scenario involves residential carpeting, either as an indoor source or as an indoor sink, then the American Society for Testing and Materials (ASTM) loading ratio of 0.43 m^2m^{-3} for floor materials could be multiplied by an assumed residential volume and assumed fractional coverage of carpeting to derive an estimate of the surface area. More specifically, a residence with a volume of 300 m^3, a loading ratio of 0.43 m^2m^{-3}, and coverage of 80%, would have 103 m^2 of carpeting. The estimates discussed here relate to macroscopic surfaces; the true surface area for carpeting, for example, would be considerably larger because of the nature of its fibrous material.

19.3.3.3. *Loading Ratios*

The loading ratios for the 8-foot ceiling height range from 0.98 m^2m^{-3} to 2.18 m^2m^{-3} for wall areas and from 0.36 m^2m^{-3} to 0.44 m^2m^{-3} for floor area. In comparison, ASTM Standard E 1333 (ASTM, 1990), for large-chamber testing of formaldehyde levels from wood products, specifies the following loading ratios: (1) 0.95 m^2m^{-3} for testing plywood (assumes plywood or paneling on all four walls of a typical size room); and (2) 0.43 m^2m^{-3} for testing particleboard (assumes that particleboard decking or underlayment would be used as a substrate for the entire floor of a structure).

19.3.3.4. *Mechanical System Configurations*

Mechanical systems for air movement in residences can affect the migration and mixing of pollutants released indoors and the rate of pollutant removal. Three types of mechanical systems are (1) systems associated with heating, ventilating, and air conditioning (HVAC); (2) systems whose primary function is providing localized exhaust; and (3) systems intended to increase the overall air exchange rate of the residence.

Portable space heaters intended to serve a single room, or a series of adjacent rooms, may or may not be equipped with blowers that promote air movement and mixing. Without a blower, these heaters still have the ability to induce mixing through convective heat transfer. If the heater is a source of combustion pollutants, as with unvented gas or kerosene space heaters, then the combination of convective heat transfer and thermal buoyancy of combustion products will result in fairly rapid dispersal of such pollutants. The pollutants will disperse throughout the floor where the heater is located and to floors above the heater, but will not disperse to floors below.

Central forced-air HVAC systems are common in many residences. Such systems, through a network of supply/return ducts and registers, can achieve fairly complete mixing within 20 to 30 minutes (Koontz et al., 1988). The air handler for such systems is commonly equipped with a filter (see Figure 19-2) that can remove particle-phase contaminants. Further removal of particles, via deposition on various room surfaces (see Section 19.5.5), is accomplished through increased air movement when the air handler is operating.

Figure 19-2 also distinguishes forced-air HVAC systems by the return layout in relation to supply registers. The return layout shown in the upper portion of the figure is the type most commonly found in residential settings. On any floor of the residence, it is typical to find one or more supply registers to individual rooms, with one or two centralized return registers. With this layout, supply/return imbalances can often occur in individual rooms, particularly if the interior doors to rooms are closed. In comparison, the supply/return layout shown in the lower portion of the figure by design tends to achieve a balance in individual rooms or zones. Airflow imbalances can also be caused by inadvertent duct leakage to unconditioned spaces such as attics, basements, and crawl spaces. Such imbalances usually depressurize the house, thereby increasing the likelihood of contaminant entry via soil-gas transport or through spillage of combustion products from vented fossil-fuel appliances such as fireplaces and gas/oil furnaces.

Mechanical devices such as kitchen fans, bathroom fans, and clothes dryers are intended primarily to provide localized removal of unwanted heat, moisture, or odors. Operation of these devices tends to increase the air exchange rate between the indoors and outdoors. Because local exhaust devices are designed to be near certain indoor sources, their

effective removal rate for locally generated pollutants is greater than would be expected from the dilution effect of increased air exchange. Operation of these devices also tends to depressurize the house, because replacement air usually is not provided to balance the exhausted air.

An alternative approach to pollutant removal is one which relies on an increase in air exchange to dilute pollutants generated indoors. This approach can be accomplished using heat recovery ventilators (HRVs) or energy recovery ventilators (ERVs). Both types of ventilators are designed to provide balanced supply and exhaust airflows and are intended to recover most of the energy that normally is lost when additional outdoor air is introduced. Although ventilators can provide for more rapid dilution of internally generated pollutants, they also increase the rate at which outdoor pollutants are brought into the house. A distinguishing feature of the two types is that ERVs provide for recovery of latent heat (moisture) in addition to sensible heat. Moreover, ERVs typically recover latent heat using a moisture-transfer device such as a desiccant wheel. It has been observed in some studies that the transfer of moisture between outbound and inbound air streams can result in some re-entrainment of indoor pollutants that otherwise would have been exhausted from the house (Andersson et al., 1993). Inadvertent air communication between the supply and exhaust air streams can have a similar effect.

Studies quantifying the effect of mechanical devices on air exchange using tracer-gas measurements are uncommon and typically provide only anecdotal data. The common approach is for the expected increment in the air exchange rate to be estimated from the rated airflow capacity of the device(s). For example, if a device with a rated capacity of 100 ft^3 per minute, or 170 m^3 per hour, is operated continuously in a house with a volume of 400 m^3, then the expected increment in the air exchange rate of the house would be 170 m^3 $hour^{-1}$/400 m^3, or approximately 0.4 ACH.

U.S. DOE RECS contains data on residential heating characteristics. The data show that most homes in the United States have some kind of heating and air conditioning system (DOE, 2008a). The types of system vary regionally within the United States. Table 19-13 shows the type of primary and secondary heating systems found in U.S. residences. The predominant primary heating system in the Midwest is natural gas (used by 72% of homes there) while most homes in the South (54%) primarily heat with electricity. Nationwide, 31% of residences have a secondary heating source, typically an electric source.

Table 19-14 shows the type of heating systems found in the United States by urban/rural location. It is noteworthy that 56% of suburban residences use central heating compared to 16% in rural areas. Another difference is that only 25% of residences in cities used a secondary heating system, which used typically electric, compared to 48% in rural areas, typically electric or wood.

Table 19-15 shows that 84% of U.S. residences have some type of cooling system: 59% have central air while 26% use window units. Like heating systems, cooling system type varies regionally as well. In the South, 97% of residences have either central or room air conditioning units whereas only 57% of residences in the Western United States have air conditioning. Frequency of use varies regionally as well. About 61% of residences in the South use their air conditioner all summer long, but only 15% do so in the Northeast.

19.3.3.5. *Type of Foundation*

The type of foundation of a residence is of interest in residential exposure assessment. It provides some indication of the number of stories and house configuration, as well as an indication of the relative potential for soil−gas transport. For example, such transport can occur readily in homes with enclosed crawl spaces. Homes with basements provide some resistance, but still have numerous pathways for soil−gas entry. By comparison, homes with crawl spaces open to the outside have significant opportunities for dilution of soil gases prior to transport into the house. Using data from the 2009 AHS, of total housing units in the United States, 33% have a basement under the entire building, 10% have a basement under part of the building, 23% have a crawl space, and 32% are on a concrete slab (U.S. Census Bureau, 2009).

19.3.3.5.1. Lucas et al. (1992)—National Residential Radon Survey

The estimated percentage of homes with a full or partial basement according to the National Residential Radon Survey of 5,700 households nationwide was 45% (see Table 19-16) (Lucas et al., 1992). The National Residential Radon Survey provides data for more refined geographical areas, with a breakdown by the 10 U.S. EPA Regions. The New England region (i.e., U.S. EPA Region 1), which includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, had the highest prevalence of basements (93%). The lowest prevalence (4%) was for the South Central region (i.e., U.S. EPA Region 6), which includes Arkansas,

Louisiana, New Mexico, Oklahoma, and Texas. Section 19.3.3.5.2 presents the States associated with each census region and U.S. EPA region.

19.3.3.5.2. U.S. DOE (2008a)—Residential Energy Consumption Survey (RECS)

The most recent RECS (described in Section 19.3.1.1) was administered in 2005 to over 4,381 households (DOE, 2008a). The type of information requested by the survey questionnaire included the type of foundation for the residence (i.e., basement, enclosed crawl space, crawl space open to outside, or concrete slab). This information was not obtained for multifamily structures with five or more dwelling units or for mobile homes. U.S. EPA analyzed the RECS 2005 data (DOE, 2008a) to estimate the percentage of residences with basements and different foundation types by census region and by U.S. EPA region. Table 19-17 presents these estimates. Table 19-18 shows the states associated with each U.S. EPA region and census region. Table 19-19 presents estimates of the percentage of residences with each foundation type, by census region, and for the entire United States. The percentages can add up to more than 100% because some residences have more than one type of foundation; for example, many split-level structures have a partial basement combined with some crawlspace that typically is enclosed. The data in Table 19-19 indicate that 40.6% of residences nationwide have a basement. It also shows that a large fraction of homes have concrete slabs (46%). There are also variations by census region. For example, around 73% and 68% of the residences in the Northeast and Midwest regions, respectively, have basements. In the South and West regions, the predominant foundation type is concrete slab.

The advantage of this study is that it had a large sample size, and it was representative of houses in the United States. Also, it included various housing types. A limitation of this analysis is that homes have multiple foundation types, and the analysis does not provide estimates of square footage for each type of foundation.

19.4. NON-RESIDENTIAL BUILDING CHARACTERISTICS STUDIES

19.4.1. U.S. DOE (2008b)—Non-Residential Building Characteristics—Commercial Buildings Energy Consumption Survey (CBECS)

The U.S. Department of Energy conducts the CBECS to collect data on the characteristics and energy use of commercial buildings. The survey is conducted every 4 years. The latest survey for which data are available (released in 2008) is the 2003 CBECS. CBECS defines "Commercial" buildings as all buildings in which at least half of the floorspace is used for a purpose that is not residential, industrial, or agricultural, so they include building types that might not traditionally be considered commercial, such as schools, correctional institutions, and buildings used for religious worship.

CBECS is a national survey of U.S. buildings that DOE first conducted in 1979. The 2003 CBECS provided nationwide estimates for the United States based upon a weighted statistical sample of 5,215 buildings. DOE releases a data set about the sample buildings for public use. The 2003 CBECS Public Use Microdata set includes data for 4,820 non-mall commercial buildings (DOE, 2008b). A second data set available that includes information on malls, lacks building characteristics data. Building characteristics data provided by CBECS includes floor area, number of floors, census division, heating and cooling design, principal building activity, number of employees, and weighting factors. The 2003 CBECS data survey provides the best statistical characterization of the commercial sector available for the United States. A 2007 CBECS was conducted, but the data were not publicly available at the time this handbook was published.

In 2010, U.S. EPA conducted an analysis of the U.S. DOE CBECS 2003 data, released in 2008. Table 19-20 shows that non-residential buildings vary greatly in volumes. The table shows average volume for a numbers of structures including offices (5,036 m^3), restaurants (food services) (1,889 m^3), schools (education) (8,694 m^3), hotels (lodging) (11,559 m^3), and enclosed shopping malls (287,978 m^3). Each of these structures varies considerably in size as well. The large shopping malls are over 500,000 m^3 (90^{th} percentile). The most numerous of the non-residential buildings are office buildings (18%), non-food service buildings (13%), and warehouses (13%).

Table 19-21 presents data on the number of hours various types of non-residential buildings are open for business and the number of employees that

work in such buildings. In general, places of worship have the most limited hours. The average place of worship is open 32 hours per week. On the other extreme are healthcare facilities, which are open 168 hours a week (24 hours per day, 7 days per week). The average restaurant is open 86 hours per week. Hours vary considerably by building type. Some offices, labs, warehouses, restaurants, police stations, and hotels are also open 24 hours per day, 7 days per week, as reflected by the 90^{th} percentiles. Table 19-21 also presents the number of employees typically employed in such buildings during the main shift. Overall, the average building houses 16 workers during its primary shift, but some facilities employ many more. The average hospital employs 471 workers during its main shift, although those in the 10^{th} percentile employ only 175, and those in the 90^{th} employ 2,250.

CBECS data on heating and cooling sources were tabulated by the U.S. Energy Information Administration of the U.S. DOE and released to the public (along with the data) in 2008 (DOE, 2008b). Table 19-22 and Table 19-23 present these data. Table 19-22 indicates that electricity and natural gas are the heating sources used by a majority of non-residential buildings. Of those buildings heated by fuel oil, most are older buildings.

Table 19-23 describes non-residential building cooling characteristics. About 78% (i.e., 3,625/4,645) of non-residential buildings have air conditioning, but this varies regionally from 14% in the Northeast to 41% in the South. Nationwide, 77% (i.e., 3,589/4,645) of non-residential buildings use electricity for air conditioning. The remaining fraction use natural gas or chilled water.

It should be noted, however, that there are many critical exposure assessment elements not addressed by CBECS. These include a number of elements discussed in more detail in the Residential Building Characteristics Studies section (i.e., Section 19.3). Data to characterize the room volume, products and materials, loading ratios, and foundation type for non-residential buildings were not available in CBECS.

Another characteristic of non-residential buildings needed in ventilation and air exchange calculations is ceiling height. In the residential section of this chapter, ceiling height was assumed to be 8 feet, a figure often assumed for residential buildings. For non-residential buildings, U.S. EPA has assumed a 20 foot ceiling height for warehouses and enclosed shopping malls and a 12-foot average ceiling height for other structures. These assumptions are based on professional judgment. Murray (1997) found that the impact of assuming an 8-foot ceiling height for residences was insignificant, but non-residential ceiling height varies more greatly and may or may not have a significant impact on calculations.

19.5. TRANSPORT RATE STUDIES

19.5.1. Air Exchange Rates

Air exchange is the balanced flow into and out of a building and is composed of three processes: (1) infiltration—air leakage through random cracks, interstices, and other unintentional openings in the building envelope; (2) natural ventilation—airflows through open windows, doors, and other designed openings in the building envelope; and (3) forced or mechanical ventilation—controlled air movement driven by fans. For nearly all indoor exposure scenarios, air exchange is treated as the principal means of diluting indoor concentrations. The air exchange rate is generally expressed in terms of ACH (with units of $hours^{-1}$). It is defined as the ratio of the airflow ($m^3\ hours^{-1}$) to the volume (m^3). Thus, ACH and building size and volume are negatively correlated.

No measurement surveys have been conducted to directly evaluate the range and distribution of building air exchange rates. Although a significant number of air exchange measurements have been carried out over the years, there has been a diversity of protocols and study objectives. Since the early 1980s, however, an inexpensive PFT technique has been used to measure time-averaged air exchange and interzonal airflows in thousands of occupied residences using essentially similar protocols (Dietz et al., 1986). The PFT technique utilizes miniature permeation tubes as tracer emitters and passive samplers to collect the tracers. The passive samplers are returned to the laboratory for analysis by gas chromatography. These measurement results have been compiled to allow various researchers to access the data (Versar, 1990).

With regard to residential air exchange, an attached garage can negatively impact indoor air quality. In addition to automobile exhaust, people often store gasoline, oil, paints, lacquers, and yard and garden supplies in garages. Appliances such as furnaces, heaters, hot water heaters, dryers, gasoline-powered appliances, and wood stoves may also impact indoor air quality. Garages can be a source of volatile organic compounds (VOCs) such as benzene, toluene, ethylbenzene, *m*,*p*-xylene, and *o*-xylene. Emmerich et al. (2003) conducted a literature review on indoor air quality and the transport of pollutants from attached garages to residential living spaces. The authors found the body

of literature on the subject was limited and contained little data with regard to airtightness and geometry of the house-garage interface, and the impact of heating and cooling equipment. They concluded, however, that there is substantial evidence that the transport of contaminants from garages has the potential to negatively impact residences.

19.5.1.1. *Key Study of Residential Air Exchange Rates*

19.5.1.1.1. Koontz and Rector (1995)—Estimation of Distributions for Residential Air Exchange Rates

In analyzing the composite data from various projects (2,971 measurements), Koontz and Rector (1995) assigned weights to the results from each state to compensate for the geographic imbalance in locations where PFT measurements were taken. The results were weighted in such a way that the resultant number of cases would represent each state in proportion to its share of occupied housing units, as determined from the 1990 U.S. Census of Population and Housing.

Table 19-24 shows summary statistics from the Koontz and Rector (1995) analysis, for the country as a whole and by census regions. Based on the statistics for all regions combined, the authors suggested that a 10^{th} percentile value of 0.18 ACH would be appropriate as a conservative estimator for air exchange in residential settings, and that the 50^{th} percentile value of 0.45 ACH would be appropriate as a typical air exchange rate. In applying conservative or typical values of air exchange rates, it is important to realize the limitations of the underlying database. Although the estimates are based on thousands of measurements, the residences represented in the database are not a random sample of the U.S. housing stock. Also, the sample population is not balanced in terms of geography or time of year, although statistical techniques were applied to compensate for some of these imbalances. In addition, PFT measurements of air exchange rates assume uniform mixing of the tracer within the building. This is not always so easily achieved. Furthermore, the degree of mixing can vary from day to day and house to house because of the nature of the factors controlling mixing (e.g., convective air monitoring driven by weather, and type and operation of the heating system). The relative placement of the PFT source and the sampler can also cause variability and uncertainty. It should be noted that sampling is typically done in a single location in a house that may not represent the average from that house. In addition, very high and very low values of air exchange rates based on PFT measurements have greater uncertainties than those in the middle of the distribution. Despite such limitations, the estimates in Table 19-24 are believed to represent the best available information on the distribution of air exchange rates across U.S. residences throughout the year.

19.5.1.2. *Relevant Studies of Residential Air Exchange Rates*

19.5.1.2.1. Nazaroff et al. (1988)—Radon Entry via Potable Water

Nazaroff et al. (1988) aggregated the data from two studies conducted earlier using tracer-gas decay. At the time these studies were conducted, they were the largest U.S. studies to include air exchange measurements. The first (Grot and Clark, 1979) was conducted in 255 dwellings occupied by low-income families in 14 different cities. The geometric mean ± standard deviation for the air exchange measurements in these homes, with a median house age of 45 years, was 0.90 ± 2.13 ACH. The second study (Grimsrud et al., 1983) involved 312 newer residences, with a median age of less than 10 years. Based on measurements taken during the heating season, the geometric mean ± standard deviation for these homes was 0.53 ± 1.71 ACH. Based on an aggregation of the two distributions with proportional weighting by the respective number of houses studied, Nazaroff et al. (1988) developed an overall distribution with a geometric mean of 0.68 ACH and a geometric standard deviation of 2.01.

19.5.1.2.2. Versar (1990)—Database of PFT Ventilation Measurements

The residences included in the PFT database do not constitute a random sample across the United States. They represent a compilation of homes visited in the course of about 100 separate field-research projects by various organizations, some of which involved random sampling, and some of which involved judgmental or fortuitous sampling. Table 19-25 summarizes the larger projects in the PFT database, in terms of the number of measurements (samples), states where samples were taken, months when samples were taken, and summary statistics for their respective distributions of measured air exchange rates. For selected projects (Lawrence Berkeley Laboratory, Research Triangle Institute, Southern California—SOCAL), multiple measurements were taken for the same house, usually during different seasons. A large majority of the measurements are from the SOCAL project that was

conducted in Southern California. The means of the respective studies generally range from 0.2 to 1.0 ACH, with the exception of two California projects—RTI2 and SOCAL2. Both projects involved measurements in Southern California during a time of year (July) when windows would likely be opened by many occupants.

The limitation of this study is that the PFT database did not base its measurements on a sample that was statistically representative of the national housing stock. PFT has been found to underpredict seasonal average air exchange by 20 to 30% (Sherman, 1989). Using PFT to determine air exchange can produce significant errors when conditions in the measurement scene greatly deviate from idealizations calling for constant, well-mixed conditions.

19.5.1.2.3. Murray and Burmaster (1995)—Residential Air Exchange Rates in the United States: Empirical and Estimated Parametric Distributions by Season and Climatic Region

Murray and Burmaster (1995) analyzed the PFT database using 2,844 measurements (essentially the same cases as analyzed by Koontz and Rector (1995), but without the compensating weights). These authors summarized distributions for subsets of the data defined by climate region and season. The months of December, January, and February were defined as winter; March, April, and May were defined as spring; and so on. Table 19-26 summarizes the results of Murray and Burmaster (1995) Neglecting the summer results in the colder regions, which have only a few observations, the results indicate that the highest air exchange rates occur in the warmest climate region during the summer. As noted earlier, many of the measurements in the warmer climate region were from field studies conducted in Southern California during a time of year (July) when windows would tend to be open in that area. Data for this region in particular should be used with caution because other areas within this region tend to have very hot summers, and residences use air conditioners, resulting in lower air exchange rates. The lowest rates generally occur in the colder regions during the fall.

19.5.1.2.4. Diamond et al. (1996)—Ventilation and Infiltration in High-Rise Apartment Buildings

Diamond et al. (1996) studied air flow in a 13-story apartment building and concluded that "the ventilation to the individual units varies considerably." With the ventilation system disabled, units at the lower level of the building had adequate ventilation only on days with high temperature differences, while units on higher floors had no ventilation at all. At times, units facing the windward side were over-ventilated. With the mechanical ventilation system operating, they found wide variation in the air flows to individual apartments. Diamond et al. (1996) also conducted a literature review and concluded there were little published data on air exchange in multifamily buildings, and that there was a general problem measuring, modeling, and designing ventilation systems for high-rise multifamily buildings. Air flow was dependent upon building type, occupation behavior, unit location, and meteorological conditions.

19.5.1.2.5. Graham et al. (2004)—Contribution of Vehicle Emissions From an Attached Garage to Residential Indoor Air Pollution Levels

There have been several studies of vehicle emission seepage into homes from attached garages, which examined a single home. Graham et al. (2004) conducted a study of vehicle emission seepage of 16 homes with attached garages. On average, 11% of total house leakage was attributed to the house/garage interface (equivalent to an opening of 124 cm^2), but this varied from 0.6 to 29.6%. The amount of in-house chemical concentrations attributed to vehicle emissions from the garage varied widely between homes from 9 to 85%. Greater leakage tended to occur in houses where the garage attached to the house on more than one side. The home's age was not an important factor. Whether the engine was warm or cold when it was started was important because cold-start emissions are dominated by the by-products of incomplete combustion. Cold-start tail pipe emissions were 32 times greater for carbon monoxide (CO), 10 times greater for nitrogen oxide (NO_x), and 18 times greater for total hydrocarbon emissions than hot-start tailpipe emissions.

19.5.1.2.6. Price et al. (2006)—Indoor-Outdoor Air Leakage of Apartments and Commercial Buildings

Price et al. (2006) compiled air exchange rate data from 14 different studies on apartment buildings in the United States and Canada. The authors found that indoor-outdoor air exchange rates seem to be twice as high for apartments as for single-family houses. The observed apartment air exchange rates ranged from 0.5 to 2 ACH.

19.5.1.2.7. Yamamoto et al. (2010)—Residential Air Exchange Rates in Three U.S. Metropolitan Areas: Results From the Relationship Among Indoor, Outdoor, and Personal Air Study 1999–2001

Between 1999 and 2001, Yamamoto et al. (2010) conducted approximately 500 indoor-outdoor air exchange rate (AER) calculations based on residences in metropolitan Elizabeth, NJ; Houston, TX; and Los Angeles, CA. The median AER across these urban areas was 0.71 ACH; 0.87 in CA, 0.88 in NJ, and 0.47 in TX. In Texas, the measured AERs were lower in the summer cooling season (median = 0.37 ACH) than in the winter heating season (median = 0.63 ACH), likely because of the reported use of room air conditioners. The measured AERs in California were higher in summer (median = 1.13 ACH) than in winter (median = 0.61 ACH) because summers in Los Angeles County are less humid than NJ or TX, and residents are more likely to utilize natural ventilation through open windows and screened doors. In New Jersey, air exchange rates in the heating and cooling seasons were similar.

19.5.1.3. *Key Study of Non-Residential Air Exchange Rates*

19.5.1.3.1. Turk et al. (1987)—Commercial Building Ventilation Rates and Particle Concentrations

Few air exchange rates for commercial buildings are provided in the literature. Turk et al. (1987) conducted indoor air quality measurements, including air exchange rates, in 38 commercial buildings. The buildings ranged in age from 0.5 to 90 years old. One test was conducted in 36 buildings, and two tests were conducted in 2 buildings. Each building was monitored for 10 working days over a 2-week period yielding a minimum sampling time of 75 hours per building. Researchers found an average ventilation measurement of 1.5 ACH, which ranged from 0.3 to 4.1 ACH with a standard deviation of 0.87. Table 19-27 presents the results by building type.

19.5.2. Indoor Air Models

Achieving adequate indoor air quality in a non-residential building can be challenging. There are many factors that affect indoor air quality in buildings (e.g., building materials, outdoor environment, ventilation systems, operation and maintenance, occupants and their activities). Indoor air models are typically used to study, identify, and solve problems involving indoor air quality in buildings, as well as to assess efficiency of energy use. Indoor air quality models generally are not software products that can be purchased as "off-the-shelf" items. Most existing software models are research tools that have been developed for specific purposes and are being continuously refined by researchers. Leading examples of indoor air models implemented as software products are as follows:

- CONTAM 3.0—CONTAM was developed at the National Institute of Standards and Technology (NIST) with support from U.S. EPA and the U.S. DOE. Version 3.0 was sponsored by the Naval Surface Warfare Center Dahlgren Division. (Walton and Dols, 2010; Wang et al., 2010; Axley, 1988).
- IAQX—The Indoor Air Quality and Inhalation Exposure model is a Windows-based simulation software package developed by U.S. EPA (Guo, 2000).
- CPIEM—The California Population Indoor Exposure Model was developed for the California Air Resources Board (Rosenbaum et al., 2002).
- TEM—The Total Exposure Model was developed with support from U.S. EPA and the U.S. Air Force (Wilkes and Nuckols, 2000; Wilkes, 1998).
- RISK—RISK was developed by the Indoor Environment Management Branch of the U.S. EPA National Risk Management Research Laboratory (Sparks, 1997).
- TRIM—The Total Risk Integrated Methodology is an ongoing modeling project of U.S. EPA's Office of Air Quality Planning and Standards (Efroymson and Murphy, 2001; Palma et al., 1999).
- TOXLT/TOXST—The Toxic Modeling System Long-Term was developed along with the release of the new version of the U.S. EPA's Industrial Source Complex Dispersion Models (U.S. EPA, 1995).
- MIAQ—The Multi-Chamber Indoor Air Quality Model was developed for the California Institute of Technology and Lawrence Berkeley National Laboratory. Documentation last updated in 2002. (Nazaroff and Cass, 1989b, 1986).
- MCCEM—the Multi-Chamber Consumer Exposure Model was developed for U.S. EPA Office of Pollution Prevention and Toxics (EPA/OPPT) (Koontz and Nagda, 1991; GeoMet, 1989).

Price (2001) is an evaluation of the use of many of the above products (TOXLT/TOXST, MCCEM, IAQX, CONTAM, CPIEM, TEM, TRIM, and RISK) in a tiered approach to assessing exposures and risks to children. The information provided is also applicable to adults.

19.5.3. Infiltration Models

A variety of mathematical models exist for prediction of air infiltration rates in individual buildings. A number of these models have been reviewed, for example, by Liddament and Allen (1983), and by Persily and Linteris (1983). Basic principles are concisely summarized in the ASHRAE Handbook of Fundamentals (ASHRAE, 2009). These models have a similar theoretical basis; all address indoor-outdoor pressure differences that are maintained by the actions of wind and stack (temperature difference) effects. The models generally incorporate a network of airflows where nodes representing regions of different pressure are interconnected by leakage paths. Individual models differ in details such as the number of nodes they can treat or the specifics of leakage paths (e.g., individual components such as cracks around doors or windows versus a combination of components such as an entire section of a building). Such models are not easily applied by exposure assessors, however, because the required inputs (e.g., inferred leakage areas, crack lengths) for the model are not easy to gather.

Another approach for estimating air infiltration rates is developing empirical models. Such models generally rely on the collection of infiltration measurements in a specific building under a variety of weather conditions. The relationship between the infiltration rate and weather conditions can then be estimated through regression analysis and is usually stated in the following form:

$$A = a + b\left|T_i - T_0\right| + cU^n \qquad \text{(Eqn. 19-1)}$$

where:

A = air infiltration rate (hours^{-1}),
T_i = indoor temperature (°C),
T_o = outdoor temperature (°C),
U = windspeed (m/second),
n is an exponent with a value typically between 1 and 2, and
a, b and c are parameters to be estimated.

Relatively good predictive accuracy usually can be obtained for individual buildings through this approach. However, exposure assessors often do not have the information resources required to develop parameter estimates for making such predictions.

A reasonable compromise between the theoretical and empirical approaches has been developed in the model specified by Dietz et al. (1986). The model, drawn from correlation analysis of environmental measurements and air infiltration data, is formulated as follows:

$$A = L\left(0.006\Delta T\frac{0.03}{C}U^{1.5}\right) \qquad \text{(Eqn. 19-2)}$$

where:

A = average ACH or infiltration rate, hours^{-1},
L = generalized house leakiness factor ($1 < L < 5$),
C = terrain sheltering factor ($1 < C < 10$),
ΔT = indoor-outdoor temperature difference (°C), and
U = windspeed (m/second).

The value of L is greater as house leakiness increases, and the value of C is greater as terrain sheltering (reflects shielding of nearby wind barrier) increases. Although the above model has not been extensively validated, it has intuitive appeal, and it is possible for the user to develop reasonable estimates for L and C with limited guidance. Historical data from various U.S. airports are available for estimation of the temperature and windspeed parameters. As an example application, consider a house that has central values of 3 and 5 for L and C, respectively. Under conditions where the indoor temperature is 20°C (68°F), the outdoor temperature is 0°C (32°F), and the windspeed is 5 m/second, the predicted infiltration rate for that house would be 3 ($0.006 \times 20 + 0.03/5 \times 51.5$), or 0.56 ACH. This prediction applies under the condition that exterior doors and windows are closed and does not include the contributions, if any, from mechanical systems (see Section 19.3.3.4). Occupant behavior, such as opening windows, can, of course, overwhelm the idealized effects of temperature and wind speed.

Chan et al. (2005) analyzed the U.S. Residential Air Leakage database at Lawrence Berkley National Laboratory (LBNL) containing 73,000 air leakage measurements from 30 states (predominantly Ohio,

Alaska, and Wisconsin). They present the following equation for estimating ACH:

$$ACH = 48\left(\frac{2.5}{H}\right)^{0.3}\frac{NL}{HF}\left[h^{-1}\right] \qquad \text{(Eqn. 19-3)}$$

where:

ACH	= air changes per hour,
H	= building height (meters),
NL	= normalized leakage (unitless),
F	= scaling factor (unitless), and
h	= hours.

Chan et al. (2005) found that "older and smaller homes are more likely to have higher normalized leakage areas than newer and larger ones." Table 19-28 summarizes the normalized leakage distributions in the United States.

It should be noted that newer homes were generally built tighter until about 1997 when the construction trend leveled off. Sherman and Matson (2002) also examined LBNL's U.S. Residential Air Leakage database and found that average normalized leakage for 22,000 houses already in the database was 1.18 *NL* (total leakage cm^2 normalized for dwelling size m^2), but leakage among the 8,700 newer homes averaged 0.30 *NL*.

19.5.4. Vapor Intrusion

In 1998, concerns about subsurface contamination of soil or ground water impacting indoor air quality led the U.S. EPA to develop a series of models for estimating health risks from subsurface vapor intrusion into buildings based on the analytical solutions of Johnson and Ettinger (1991). Since that time, the models have been revised, and new models have been added. The 3-phase soil contamination models theoretically partition the contamination into three discrete phases: (1) in solution with water, (2) sorbed to the soil organic carbon, and (3) in vapor phase within the air-filled pores of the soil. Two new models have been added, allowing the user to estimate vapor intrusion into buildings from measured soil gas data. When Non-Aqueous Phase Liquid (NAPL) is present in soils, the contamination includes a fourth or residual phase. In such cases, the new NAPL models can be used to estimate the rate of vapor intrusion into buildings and the associated health risks. The new NAPL models use a numerical approach for simultaneously solving the time-averaged soil and building vapor concentration for each of up to 10 soil contaminants. This involves a series of iterative calculations for each contaminant. These models are available online from U.S. EPA at http://www.epa.gov/oswer/riskassessment/airmodel/johnson_ettinger.htm.

19.5.5. Deposition and Filtration

Deposition refers to the removal of airborne substances to available surfaces that occurs as a result of gravitational settling and diffusion, as well as electrophoresis and thermophoresis. Filtration is driven by similar processes but is confined to material through which air passes. Filtration is usually a matter of design, whereas deposition is a matter of fact.

19.5.5.1. *Deposition*

The deposition of particulate matter and reactive gas-phase pollutants to indoor surfaces is often stated in terms of a characteristic deposition velocity ($m\ hour^{-1}$) allied to the surface-to-volume ratio ($m^2\ m^{-3}$) of the building or room interior, forming a first order loss rate ($hour^{-1}$) similar to that of air exchange. Theoretical considerations specific to indoor environments have been summarized in comprehensive reviews by Nazaroff and Cass (1989a) and Nazaroff et al. (1993).

For airborne particles, deposition rates depend on aerosol properties (size, shape, density) as well as room factors (thermal gradients, turbulence, surface geometry). The motions of larger particles are dominated by gravitational settling; the motions of smaller particles are subject to convection and diffusion. Consequently, larger particles tend to accumulate more rapidly on floors and up-facing surfaces while smaller particles may accumulate on surfaces facing in any direction. Figure 19-3 illustrates the general trend for particle deposition across the size range of general concern for inhalation exposure (<10 µm). The current thought is that theoretical calculations of deposition rates are likely to provide unsatisfactory results due to knowledge gaps relating to near-surface air motions and other sources of inhomogeneity (Nazaroff et al., 1993).

19.5.5.1.1. Thatcher and Layton (1995)—Deposition, Resuspension, and Penetration of Particles Within a Residence

Thatcher and Layton (1995) evaluated removal rates for indoor particles in four size ranges (1–5,

5-10, 10–25, and >25 μm) in a study of one house occupied by a family of four. Table 19-29 lists these values. In a subsequent evaluation of data collected in 100 Dutch residences, Layton and Thatcher (1995) estimated settling velocities of 2.7 m $hour^{-1}$ for lead-bearing particles captured in total suspended particulate matter samples.

19.5.5.1.2. Wallace (1996)—Indoor Particles: A Review

In a major review of indoor particles, Wallace (1996) cited overall particle deposition per hour ($hour^{-1}$) for respirable ($PM_{2.5}$), inhalable (PM_{10}), and coarse (difference between PM_{10} and $PM_{2.5}$) size fractions determined from U.S. EPA's Particle Total Exposure Assessment Methodological Study (PTEAM) study. These values, listed in Table 19-30, were derived from measurements conducted in nearly 200 residences.

19.5.5.1.3. Thatcher et al. (2002)—Effects of Room Furnishings and Air Speed on Particle Deposition Rates Indoors

Thatcher et al. (2002) measured deposition loss rate coefficients for particles of different median diameters (0.55 to 8.66 mm) with fans off and on at various airspeeds in three types of experimental rooms: (1) bare (unfurnished with metal floor), (2) carpeted and unfurnished, and (3) fully furnished. They concluded that large particles (over 25 μm) settle eight times faster than small particles (1–5 μm). Table 19-31 summarizes the results.

19.5.5.1.4. He et al. (2005)—Particle Deposition Rates in Residential Houses

He et al. (2005) investigated particle deposition rates for particles ranging in size from 0.015 to 6 μm. The lowest deposition rates were found for particles between 0.2 and 0.3 μm for both minimum (air exchange rate: 0.61 ± 0.45 $hour^{-1}$) and normal (air exchange rate: 3.00 ± 1.23 $hour^{-1}$) conditions. Thus, air exchange rate was an important factor affecting deposition rates for particles between 0.08 and 1.0 μm, but not for particles smaller than 0.08 μm or larger than 1.0 μm.

19.5.5.2. *Filtration*

A variety of air cleaning techniques have been applied to residential settings. Basic principles related to residential-scale air cleaning technologies have been summarized in conjunction with reporting early test results (Offermann et al., 1984). General engineering principles are summarized in ASHRAE (1988). In addition to fibrous filters integrated into central heating and air conditioning systems, extended surface filters and High Efficiency Particle Arrest filters, as well as electrostatic systems, are available to increase removal efficiency. Free-standing air cleaners (portable and/or console) are also being used. Product-by-product test results reported by Hanley et al. (1994); Shaughnessy et al. (1994); and Offerman et al. (1984) exhibit considerable variability across systems, ranging from ineffectual (<1% efficiency) to nearly complete removal.

19.5.6. Interzonal Airflows

Residential structures consist of a number of rooms that may be connected horizontally, vertically, or both horizontally and vertically. Before considering residential structures as a detailed network of rooms, it is convenient to divide them into one or more zones. At a minimum, each floor is typically defined as a separate zone. For indoor air exposure assessments, further divisions are sometimes made within a floor, depending on (1) locations of specific contaminant sources and (2) the presumed degree of air communication among areas with and without sources.

Defining the airflow balance for a multiple-zone exposure scenario rapidly increases the information requirements as rooms or zones are added. As shown in Figure 19-4, a single-zone system (considering the entire building as a single well-mixed volume) requires only two airflows to define air exchange. Further, because air exchange is balanced flow (air does not "pile up" in the building, nor is a vacuum formed), only one number (the air exchange rate) is needed. With two zones, six airflows are needed to accommodate interzonal airflows plus air exchange; with three zones, 12 airflows are required. In some cases, the complexity can be reduced using judicious (if not convenient) assumptions. Interzonal airflows connecting non-adjacent rooms can be set to zero, for example, if flow pathways do not exist. Symmetry also can be applied to the system by assuming that each flow pair is balanced.

Examples of interzonal airflow models include CONTAM (developed by NIST) and COMIS (Feustel and Raynor-Hoosen, 1990).

19.5.7. House Dust and Soil Loadings

House dust is a complex mixture of biologically derived material (animal dander, fungal spores, etc.), particulate matter deposited from the indoor aerosol, and soil particles brought in by foot traffic. House dust may contain VOCs (Hirvonen et al., 1994; Wolkoff and Wilkins, 1994), pesticides from

imported soil particles as well as from direct applications indoors (Roberts et al., 1991), and trace metals derived from outdoor sources (Layton and Thatcher, 1995). The indoor abundance of house dust depends on the interplay of deposition from the airborne state, resuspension due to various activities, direct accumulation, and infiltration.

In the absence of indoor sources, indoor concentrations of particulate matter are significantly lower than outdoor levels. For some time, this observation supported the idea that a significant fraction of the outdoor aerosol is filtered out by the building envelope. More recent data, however, have shown that deposition (incompletely addressed in earlier studies) accounts for the indoor-outdoor contrast, and outdoor particles smaller than 10-µm aerodynamic diameter penetrate the building envelope as completely as non-reactive gases (Wallace, 1996).

It should be noted that carpet dust loadings may be higher than previously believed. This is important because embedded dust is a reservoir for organic compounds. Fortune et al. (2000) compared the mass of dust in carpets removed using conventional vacuuming to that removed by vacuuming with a beater-bar to remove deeply embedded dust. The amount removed was 10 times that removed by conventional vacuuming.

19.5.7.1. *Roberts et al. (1991)—Development and Field Testing of a High-Volume Sampler for Pesticides and Toxics in Dust*

Dust loadings, reported by Roberts et al. (1991), were measured in conjunction with the Non-Occupational Pesticide Exposure Study (NOPES). In this study, house dust was sampled from a representative grid using a specially constructed high-volume surface sampler. The surface sampler collection efficiency was verified in conformance with ASTM F608 (ASTM, 1989). Table 19-32 summarizes data collected from carpeted areas in volunteer households in Florida encountered during the course of NOPES. Seven of the nine sites were single-family detached homes, and two were mobile homes. The authors noted that the two houses exhibiting the highest dust loadings were only those homes where a vacuum cleaner was not used for housekeeping.

19.5.7.2. *Thatcher and Layton (1995)—Deposition, Resuspension, and Penetration of Particles Within a Residence*

Relatively few studies have been conducted at the level of detail needed to clarify the dynamics of indoor aerosols. One intensive study of a California residence (Thatcher and Layton, 1995), however, provides instructive results. Using a model-based analysis for data collected under controlled circumstances, the investigators verified penetration of the outdoor aerosol and estimated rates for particle deposition and resuspension (see Table 19-33). The investigators stressed that normal household activities are a significant source of airborne particles larger than 5 µm. During the study, they observed that just walking into and out of a room could momentarily double the concentration. The airborne abundance of submicrometer particles, on the other hand, was unaffected by either cleaning or walking.

Mass loading of floor surfaces (see Table 19-34) was measured in the study of Thatcher and Layton (1995) by thoroughly cleaning the house and sampling accumulated dust, after 1 week of normal habitation and no vacuuming. The methodology, validated under ASTM F608 (ASTM, 1989), showed fine dust recovery efficiencies of 50% with new carpet and 72% for linoleum. Tracked areas showed consistently higher accumulations than untracked areas, confirming the importance of tracked-in material. Differences between tracked areas upstairs and downstairs show that tracked-in material is not readily transported upstairs. The consistency of untracked carpeted areas throughout the house, suggests that, in the absence of tracking, particle transport processes are similar on both floors.

19.6. CHARACTERIZING INDOOR SOURCES

Product- and chemical-specific mechanisms for indoor sources can be described using simple emission factors to represent instantaneous releases, as well as constant releases over defined time periods; more complex formulations may be required for time-varying sources. Guidance documents for characterizing indoor sources within the context of the exposure assessment process are limited [see, for example, U.S. EPA (1987); Wolkoff (1995)]. Fairly extensive guidance exists in the technical literature, however, provided that the exposure assessor has the means to define (or estimate) key mechanisms and chemical-specific parameters. Basic concepts are summarized below for the broad source categories

that relate to airborne contaminants, waterborne contaminants, and for soil/house dust indoor sources.

19.6.1. Source Descriptions for Airborne Contaminants

Table 19-35 summarizes simplified indoor source descriptions for airborne chemicals for direct emission sources (e.g., combustion, pressurized propellant products), as well as emanation sources (e.g., evaporation from "wet" films, diffusion from porous media), and transport-related sources (e.g., infiltration of outdoor air contaminants, soil gas entry).

Direct-emission sources can be approximated using simple formulas that relate pollutant mass released to characteristic process rates. Combustion sources, for example, may be stated in terms of an emission factor, fuel content (or heating value), and fuel consumption (or carrier delivery) rate. Emission factors for combustion products of general concern (e.g., CO, NO_x) have been measured for a number of combustion appliances using room-sized chambers [see, for example, Relwani et al. (1986)]. Other direct-emission sources would include volatiles released from water use and from pressurized consumer products. Resuspension of house dust (see Section 19.5.5.1) would take on a similar form by combining an activity-specific rate constant with an applicable dust mass.

Diffusion-limited sources (e.g., carpet backing, furniture, flooring, dried paint) represent probably the greatest challenge in source characterization for indoor air quality. Vapor-phase organics dominate this group, offering great complexity because (1) there is a fairly long list of chemicals that could be of concern, (2) ubiquitous consumer products, building materials, coatings, and furnishings contain varying amounts of different chemicals, (3) source dynamics may include non-linear mechanisms, and (4) for many of the chemicals, emitting as well as non-emitting materials evident in realistic settings may promote reversible and irreversible sink effects. Very detailed descriptions for diffusion-limited sources can be constructed to link specific properties of the chemical, the source material, and the receiving environment to calculate expected behavior [see, for example, U.S. EPA (1990a); Cussler (1984)]. Validation to actual circumstances, however, suffers practical shortfalls because many parameters simply cannot be measured directly.

The exponential formulation listed in Table 19-35 was derived based on a series of papers generated during the development of chamber testing methodology by U.S. EPA (Dunn and Chen, 1993; Dunn and Tichenor, 1988; Dunn, 1987). This framework represents an empirical alternative that works best when the results of chamber tests are available. Estimates for the initial emission rate (E_o) and decay factor (k_s) can be developed for hypothetical sources from information on pollutant mass available for release (M) and supporting assumptions.

Assuming that a critical time period (t_c) coincides with reduction of the emission rate to a critical level (E_c) or with the release of a critical fraction of the total mass (M_c), the decay factor can be estimated by solving either of these relationships:

$$\frac{E_c}{E_0} = e^{-k_s t_c} \qquad \text{(Eqn. 19-4)}$$

where:

E_c = emission rate to a critical level (µg hour^{-1}),
E_0 = initial emission rate (µg hour^{-1}),
k_s = decay factor (µg hour^{-1}), and
t_c = critical time period (hours),

or

$$\frac{M_c}{M} = 1 - e^{-k_s t_c} \qquad \text{(Eqn. 19-5)}$$

where:

M_c = critical mass (µg), and
M = total mass (µg).

The critical time period can be derived from product-specific considerations (e.g., equating drying time for paint to 90% emissions reduction). Given such an estimate for k_s, the initial emission rate can be estimated by integrating the emission formula to infinite time under the assumption that all chemical mass is released:

$$M = \int_0^\infty E_0\, e - k_s t\, dt = \frac{E_0}{k_s} \qquad \text{(Eqn. 19-6)}$$

The basis for the exponential source algorithm has also been extended to the description of more complex diffusion-limited sources. With these sources, diffusive or evaporative transport at the

interface may be much more rapid than diffusive transport from within the source material, so that the abundance at the source/air interface becomes depleted, limiting the transfer rate to the air. Such effects can prevail with skin formation in "wet" sources like stains and paints [see, for example, Chang and Guo (1992)]. Similar emission profiles have been observed with the emanation of formaldehyde from particleboard with "rapid" decline as formaldehyde evaporates from surface sites of the particleboard over the first few weeks. It is then followed by a much slower decline over ensuing years as formaldehyde diffuses from within the matrix to reach the surface [see, for example, Zinn et al. (1990)].

Transport-based sources bring contaminated air from other areas into the airspace of concern. Examples include infiltration of outdoor contaminants, and soil gas entry. Soil gas entry is a particularly complex phenomenon and is frequently treated as a separate modeling issue (Sextro, 1994; Little et al., 1992). Room-to-room migration of indoor contaminants would also fall under this category, but this concept is best considered using multi-zone models.

19.6.2. Source Descriptions for Waterborne Contaminants

Residential water supplies may be a route for exposure to chemicals through ingestion, dermal contact, or inhalation. These chemicals may appear in the form of contaminants (e.g., trichloroethylene) as well as naturally occurring by-products of water system history (e.g., chloroform, radon). Among indoor water uses, showering, bathing, and hand-washing of dishes or clothes provide the primary opportunities for dermal exposure. The escape of volatile chemicals to the gas phase associates water use with inhalation exposure. The exposure potential for a given chemical will depend on the source of water, the types and extents of water uses, and the extent of volatilization of specific chemicals. Primary types of residential water use include showering/bathing, toilet use, clothes washing, dishwashing, and faucet use (e.g., for drinking, cooking, general cleaning, or washing hands).

Upper-bounding estimates of chemical release rates from water use can be formulated as simple emission factors by combining the concentration in the feed water (g m^{-3}) with the flow rate for the water use (m^3 $hour^{-1}$), and assuming that the chemical escapes to the gas phase. For some chemicals, however, not all of the chemical escapes in realistic situations due to diffusion-limited transport and solubility factors. For inhalation exposure estimates, this may not pose a problem because the bounding estimate would overestimate emissions by no more than approximately a factor of two. For multiple exposure pathways, the chemical mass remaining in the water may be of importance. Refined estimates of volatile emissions are usually considered under two-resistance theory to accommodate mass transport aspects of the water-air system ([see, for example, U.S. EPA (2000); Howard-Reed et al. (1999); Moya et al. (1999); Little (1992); Andelman (1990); McKone (1987)]. More detailed descriptions of models used to estimate emissions from indoor water sources including showers, bathtubs, dishwashers, and washing machines are included in U.S. EPA (2000). Release rates (*S*) are formulated as

$$S = K_m F_w \left[C_w - \frac{C_a}{H} \right] \qquad \text{(Eqn. 19-7)}$$

where:

S = chemical release rate (g $hour^{-1}$),
K_m = dimensionless mass-transfer coefficient,
F_w = water flow rate (m^3 $hour^{-1}$),
C_w = concentration in feed water (g m^{-3}),
C_a = concentration in air (g m^{-3}), and
H = dimensionless Henry's Law constant.

Because the emission rate is dependent on the air concentration, recursive techniques are required. The mass-transfer coefficient is a function of water use characteristics (e.g., water droplet size spectrum, fall distance, water film) and chemical properties (diffusion in gas and liquid phases). Estimates of practical value are based on empirical tests to incorporate system characteristics into a single parameter [see, for example, Giardino et al. (1990)]. Once characteristics of one chemical-water use system are known (reference chemical, subscript *r*), the mass-transfer coefficient for another chemical (index chemical, subscript *i*) delivered by the same system can be estimated using formulations identified in the review by Little (1992):

$$\frac{1}{K}\left(\frac{D_{Li}}{D_{Lr}}\right)^{1/2} = \frac{1}{K_{Lr}} = \frac{1}{K_{Gr}} - \frac{1}{H}\left(\frac{D_{Gr}}{D_{Gi}}\right)^{2/3}\left(\frac{D_{Li}}{D_{Lr}}\right)^{1/2}$$

(Eqn. 19-8)

where:

D_L = liquid diffusivity (m^2 $second^{-1}$),
DG = gas diffusivity (m^2 $second^{-1}$),
KL = liquid-phase mass-transfer coefficient,
KG = gas-phase mass transfer coefficient, and
H = dimensionless Henry's Law constant.

19.6.3. Soil and House Dust Sources

The rate process descriptions compiled for soil and house dust provide inputs for estimating indoor emission rates:

$$S_d = M_d R_d A_f \qquad \text{(Eqn. 19-9)}$$

where:

S_d = dust emission (g $hour^{-1}$),
M_d = dust mass loading (g m^{-2}),
R_d = resuspension rates ($hour^{-1}$), and
A_f = floor area (m^2).

Because house dust is a complex mixture, transfer of particle-bound constituents to the gas phase may be of concern for some exposure assessments. For emission estimates, one would then need to consider particle mass residing in each reservoir (dust deposit, airborne).

19.7. ADVANCED CONCEPTS

19.7.1. Uniform Mixing Assumption

Many exposure measurements are predicated on the assumption of uniform mixing within a room or zone of a house. Mage and Ott (1994) offer an extensive review of the history of use and misuse of the concept. Experimental work by Baughman et al. (1994) and Drescher et al. (1995) indicates that, for an instantaneous release from a point source in a room, fairly complete mixing is achieved within 10 minutes when convective flow is induced by solar radiation. However, up to 100 minutes may be required for complete mixing under quiescent (nearly isothermal) conditions. While these experiments were conducted at extremely low air exchange rates (<0.1 ACH), based on the results, attention is focused on mixing within a room.

The situation changes if a human invokes a point source for a longer period and remains in the immediate vicinity of that source. Personal exposure in the near vicinity of a source can be much higher than the well-mixed assumption would suggest. A series of experiments conducted by GeoMet (1989) for the U.S. EPA involved controlled point-source releases of carbon monoxide tracer (CO), each for 30 minutes. Breathing-zone measurements located within 0.4 m of the release point were 10 times higher than for other locations in the room during early stages of mixing and transport.

Similar investigations conducted by Furtaw et al. (1995) involved a series of experiments in a controlled-environment, room-sized chamber. Furtaw et al. (1995) studied spatial concentration gradients around a continuous point source simulated by sulfur hexafluoride (SF_6) tracer with a human moving about the room. Average breathing-zone concentrations when the subject was near the source exceeded those several meters away by a factor that varied inversely with the ventilation intensity in the room. At typical room ventilation rates, the ratio of source-proximate to slightly-removed concentration was on the order of 2:1.

19.7.2. Reversible Sinks

For some chemicals, the actions of reversible sinks are of concern. For an initially "clean" condition in the sink material, sorption effects can greatly deplete indoor concentrations. However, once enough of the chemical has been adsorbed, the diffusion gradient will reverse, allowing the chemical to escape. For persistent indoor sources, such effects can serve to reduce indoor levels initially, but once the system equilibrates, the net effect on the average concentration of the reversible sink is negligible. Over suitably short time frames, this can also affect integrated exposure. For indoor sources whose emission profile declines with time (or ends abruptly), reversible sinks can serve to extend the emissions period as the chemical desorbs long after direct emissions are finished. Reversible sink effects have been observed for a number of chemicals in the presence of carpeting, wall coverings, and other materials commonly found in residential environments.

Interactive sinks (and models of the processes) are of special importance; while sink effects can greatly reduce indoor air concentrations, re-emission at lower rates over longer time periods could greatly extend the exposure period of concern. For

completely reversible sinks, the extended time could bring the cumulative exposure to levels approaching the sink-free case. Publications (Axley and Lorenzetti, 1993; Tichenor et al., 1991) show that first principles provide useful guidance in postulating models and setting assumptions for reversible-irreversible sink models. Sorption/desorption can be described in terms of Langmuir (monolayer) as well as Brunauer-Emmet-Teller (BET, multilayer) adsorption.

19.8. REFERENCES FOR CHAPTER 19

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Table 19-6. Average Estimated Volumes of U.S. Residences, by Housing Type and Ownership

Housing Type	Ownership					
	Owner-Occupied		Rental[a]		All Units	
	Volume[b] (m^3)	% of Total	Volume[b] (m^3)	% of Total	Volume[b] (m^3)	% of Total
Single-Family (Detached)	637	57.7	449	7.2	616	64.9
Single-Family (Attached)	544	3.8	313	3.1	440	6.8
Multifamily (2–4 units)	363	1.7	211	5.3	247	7.0
Multifamily (5+ Units)	253	2.1	189	13.0	197	15.1
Mobile Home	249	5.2	196	1.1	240	6.3
All Types	586	70.5	269	29.7	492	100

[a] The classification "Occupied without payment of rent" is included in the estimates for rentals.
[b] Volumes calculated from floor areas assuming a ceiling height of 8 feet. Excludes floor space in unheated garages.

Source: U.S. EPA Analysis of U.S. DOE (2008a).

Table 19-7. Residential Volumes in Relation to Year of Construction

Year of Construction	Volume[a] (m^3)	% of Total
Before 1940	527	13.2
1940–1949	464	6.7
1950–1959	465	11.3
1960–1969	446	11.2
1970–1979	422	17.0
1980–1989	451	16.7
1990–1999	567	15.6
2000–2005	640	8.3
All Years	492	100

[a] Volumes calculated from floor areas assuming a ceiling height of 8 feet. Excludes floor space in unheated garages.

Source: U.S. EPA Analysis of U.S. DOE (2008a).

Table 19-8. Summary of Residential Volume Distributions Based on U.S. DOE (2008a)[a] (m^3)

Parameter	Volume
Arithmetic Mean	492
Standard Deviation	349
10th Percentile	154
25th Percentile	231
50th Percentile	395
75th Percentile	648
90th Percentile	971

[a] All housing types, all units.

Source: U.S. EPA's Analysis of U.S. DOE (2008a).

Table 19-9. Summary of Residential Volume Distributions Based on Versar (1990) (m^3)

Parameter	Volume
Arithmetic Mean	369
Standard Deviation	209
10th Percentile	167
25th Percentile	225
50th Percentile	321
75th Percentile	473
90th Percentile	575

Source: Versar (1990); based on PFT database.

Table 19-10. Number of Residential Single Detached and Mobile Homes by Volume[a] (m^3) and Median Volumes by Housing Type

Housing Units	Total Housing Units	Seasonal	Year-Round Occupied Total	Year-Round Occupied Owner	Year-Round Occupied Renter	Vacant Total Vacant	New units in last 4 years	Manuf./ mobile homes
Total all housing units	130,112	4,618	125,494	76,428	35,378	13,688	5,955	8,769
Single detached and manufactured/mobile homes	91,241	3,524	87,717	68,742	11,176	7,799	4,291	8,769
Volume (m^3)								
Less than 113.3	988	225	764	383	220	161	10	331
113.3–169.7	2,765	462	2,303	1,085	686	532	19	1,020
169.9–226.3	6,440	593	5,847	3,519	1,495	833	68	1,935
226.5–339.6	21,224	814	20,410	14,978	3,441	1,991	557	2,779
339.8–452.8	20,636	521	20,115	16,284	2,235	1,596	827	1,309
453.1–566.1	14,361	284	14,077	12,057	1,134	886	813	334
566.3–679.4	7,589	141	7,448	6,622	429	398	535	126
679.6–905.9	7,252	137	7,115	6,391	301	424	751	54
906 or more	4,456	113	4,343	3,787	243	313	469	146
Not reported/Don't know	5,529	234	5,295	3,638	992	666	241	735
Median Volume (m^3)	385.1	260.5	393.3	407.8	294.5	339.8	521.0	247.4

[a] Converted from ft^2. Assumes 8-foot ceiling.

Source: U.S. Census Bureau (2009).

Table 19-11. Dimensional Quantities for Residential Rooms

Nominal Dimensions	Length (meters)	Width (meters)	Height (meters)	Volume (m^3)	Wall Area (m^2)	Floor Area (m^2)	Total Area (m^2)
8-Foot Ceiling							
12’ × 15’	4.6	3.7	2.4	41	40	17	74
12’ × 12’	3.7	3.7	2.4	33	36	13	62
10’ × 12’	3.0	3.7	2.4	27	33	11	55
9’ × 12’	2.7	3.7	2.4	24	31	10	51
6’ × 12’	1.8	3.7	2.4	16	27	7	40
4’ × 12’	1.2	3.7	2.4	11	24	4	32
12-Foot Ceiling							
12’ × 15’	4.6	3.7	3.7	61	60	17	94
12’ × 12’	3.7	3.7	3.7	49	54	13	80
10’ × 12’	3.0	3.7	3.7	41	49	11	71
9’ × 12’	2.7	3.7	3.7	37	47	10	67
6’ × 12’	1.8	3.7	3.7	24	40	7	54
4’ × 12’	1.2	3.7	3.7	16	36	4	44

Table 19-12. Examples of Products and Materials Associated With Floor and Wall Surfaces in Residences

Material Sources	Assumed Amount of Surface Covered[a] (m^2)
Silicone caulk	0.2
Floor adhesive	10.0
Floor wax	50.0
Wood stain	10.0
Polyurethane wood finish	10.0
Floor varnish or lacquer	50.0
Plywood paneling	100.0
Chipboard	100.0
Gypsum board	100.0
Wallpaper	100.0

[a] Based on typical values for a residence.

Source: Adapted from Tucker (1991).

Table 19-13. Residential Heating Characteristics by U.S. Census Region

Space Heating Characteristics	Housing Units (%)	U.S. Census Region			
		Northeast	Midwest	South	West
Total	100.0	100.0	100.0	100.0	100.0
Do Not Have Space Heating Equipment	1.1	Q	Q	Q	2.9
Have Main Space Heating Equipment	98.8	99.5	100.0	99.0	96.7
Main Heating Fuel and Equipment					
Natural Gas	52.4	55.3	71.9	33.4	60.7
Central Warm-Air Furnace	40.2	29.6	63.3	27.0	47.1
Steam or Hot Water System	7.4	23.8	6.3	2.5	2.5
Floor, Wall or Pipeless Furnace	2.1	Q	1.2	0.5	6.6
Room Heater	1.8	Q	Q	2.2	3.3
Other Equipment	0.8	1.0	Q	1.0	1.2
Electricity	30.3	7.8	13.7	54.3	26.9
Built-in Electric Units	4.5	4.4	4.3	3.7	6.6
Central Warm-Air Furnace	14.4	1.5	5.5	27.0	14.0
Heat Pump	8.3	Q	3.1	17.7	4.1
Portable Electric Heater	1.4	Q	Q	2.2	2.1
Other Equipment	1.7	1.0	Q	3.4	Q
Fuel Oil	6.9	30.1	2.7	1.2	1.2
Steam or Hot Water System	4.2	20.9	Q	Q	Q
Central Warm-Air Furnace	2.5	8.7	2.0	0.7	Q
Other Equipment	0.3	Q	Q	Q	Q
Wood	2.6	2.4	2.7	2.2	3.3
Propane/LPG[a]	5.4	1.9	7.4	6.6	4.1
Central Warm-Air Furnace	3.7	1.0	6.6	3.7	2.5
Room Heater	0.8	Q	Q	1.7	Q
Other Equipment	0.9	Q	Q	1.0	1.2
Kerosene	0.6	1.0	Q	1.0	Q
Other Fuel	0.5	Q	Q	Q	Q
Secondary Heating Fuel and Equipment					
No	68.6	78.6	63.3	71.0	61.6
Yes (More than One May Apply)	31.4	21.4	36.7	29.0	38.4
Natural Gas	4.5	1.9	5.9	3.2	7.4
Fireplace	2.4	Q	3.1	1.5	4.5
Room Heater	0.5	Q	Q	0.7	Q
Central Warm-Air Furnace	1.0	Q	1.6	Q	1.7
Other Equipment	0.7	Q	Q	Q	1.2
Electricity	17.7	12.1	20.7	17.0	21.1
Portable Heater	14.4	9.7	16.8	13.8	16.9
Built-in Electric Units	2.0	1.9	2.3	1.0	2.9
Heat Pump	0.5	N/R	Q	1.0	Q
Other Equipment	1.2	Q	1.6	1.5	1.7
Fuel Oil	0.4	1.0	Q	Q	N/R
Wood	8.0	4.4	8.6	7.6	11.2
Propane/LPG	2.1	1.5	2.7	2.7	N/R
Kerosene	0.8	1.0	1.2	1.0	N/R
Other Fuel	0.2	Q	Q	Q	Q

[a] Liquefied Petroleum Gas.

Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50% or fewer than 10 households were sampled.

N/R = No cases in reporting sample.

Source: U.S. DOE (2008a).

Table 19-14. Residential Heating Characteristics by Urban/Rural Location

Space Heating Characteristics	Housing Units (%)	Urban/Rural Location			
		City	Town	Suburbs	Rural
Total	100.0	100.0	100.0	100.0	100.0
Do Not Have Space Heating Equipment	1.1	1.5	Q	0.9	Q
Have Main Space Heating Equipment	98.8	98.3	99.5	99.1	99.1
Main Heating Fuel and Equipment					
Natural Gas	52.4	57.3	62.6	65.6	19.3
Central Warm-Air Furnace	40.2	42.0	45.3	56.4	16.1
Steam or Hot Water System	7.4	9.3	11.1	6.2	1.3
Floor, Wall or Pipeless Furnace	2.1	2.5	2.6	1.8	Q
Room Heater	1.8	2.3	2.6	Q	Q
Other Equipment	0.8	0.8	1.6	Q	Q
Electricity	30.3	33.8	24.2	25.6	33.2
Built-in Electric Units	4.5	5.3	4.2	4.0	4.0
Central Warm-Air Furnace	14.4	16.8	14.2	10.1	14.3
Heat Pump	8.3	7.2	4.2	9.7	12.1
Portable Electric Heater	1.4	1.7	Q	Q	2.2
Other Equipment	1.7	2.5	Q	Q	Q
Fuel Oil	6.9	5.1	8.9	5.3	10.8
Steam or Hot Water System	4.2	3.8	4.7	3.5	5.4
Central Warm-Air Furnace	2.5	1.3	3.7	2.2	4.5
Other Equipment	0.3	Q	Q	N/R	Q
Wood	2.6	0.6	Q	Q	10.3
Heating Stove	1.8	Q	Q	Q	6.7
Other Equipment	0.8	Q	Q	N/R	3.1
Propane/LPG[a]	5.4	0.6	1.1	1.3	23.3
Central Warm-Air Furnace	3.7	Q	Q	Q	16.6
Room Heater	0.8	Q	Q	Q	3.1
Other Equipment	0.9	Q	Q	Q	3.6
Kerosene	0.6	Q	Q	Q	1.8
Other Fuel	0.5	0.6	Q	Q	Q
Secondary Heating Fuel and Equipment					
No	68.6	75.2	73.2	67.4	52.0
Yes (More than One May Apply)	31.4	24.8	26.8	32.2	48.4
Natural Gas	4.5	3.8	3.7	7.5	3.1
Fireplace	2.4	1.9	1.6	4.8	1.8
Room Heater	0.5	Q	Q	Q	Q
Central Warm-Air Furnace	1.0	0.8	Q	1.3	Q
Other Equipment	0.7	0.8	Q	Q	Q
Electricity	17.7	15.9	15.8	17.6	23.3
Portable Heater	14.4	13.2	13.7	14.5	17.0
Built-in Electric Units	2.0	1.7	Q	2.2	3.1
Heat Pump	0.5	Q	Q	Q	1.3
Other Equipment	1.2	0.8	1.1	Q	2.2
Fuel Oil	0.4	N/R	Q	Q	Q
Wood	8.0	5.5	6.3	7.0	15.2
Propane/LPG	2.1	Q	Q	1.3	8.1
Kerosene	0.8	Q	Q	Q	2.2
Other Fuel	0.2	Q	Q	Q	Q

[a] Liquefied Petroleum Gas.

Q = Data withheld either because Relative Standard Error (RSE) was >50% or <10 households were sampled.

N/R = No cases in reporting sample.

Source: U.S. DOE (2008a).

Table 19-15. Residential Air Conditioning Characteristics by U.S. Census Region

Air Conditioning Characteristics	Housing Units (%)	U.S. Census Region			
		Northeast	Midwest	South	West
Total	100.0	100.0	100.0	100.0	100.0
Do Not Have Cooling Equipment	16.0	19.4	8.2	3.4	42.6
Have Cooling Equipment	84.0	80.1	91.8	96.6	57.4
Air-Conditioning Equipment[a, b]					
Central System	59.3	29.1	67.6	78.9	43.4
Window/Wall Units	26.0	51.9	25.8	19.7	14.9
Frequency of Central Air-Conditioner Use					
Never	1.3	Q	Q	1.0	3.3
Only a Few Times When Needed	10.3	7.8	15.2	6.1	14.0
Quite a Bit	11.3	5.8	17.6	11.1	9.9
All Summer	36.5	14.6	34.4	60.9	16.1
Frequency Most-Used Unit Used					
Never	0.5	Q	Q	Q	Q
Only a Few Times When Needed	10.9	23.8	12.1	5.2	8.3
Quite a Bit	6.8	14.6	6.3	5.4	2.9
All Summer	7.7	12.6	7.0	8.8	2.9

[a] In the 2005 RECS, 1.5 million housing units reported having both central and window/wall air conditioners.

[b] The number of housing units using air-conditioning includes a small, undetermined number of housing units where the fuel for central air-conditioning was other than electricity; these housing units were treated as if the air-conditioning fuel was electricity.

Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50% or fewer than 10 households were sampled.

Source: U.S. DOE (2008a).

Table 19-16. Percent of Residences With Basement, by Census Region and U.S. EPA Region

Census Region	U.S. EPA Regions	% of Residences With Basements
Northeast	1	93.4
Northeast	2	55.9
Midwest	3	67.9
Midwest	4	19.3
South	5	73.5
South	6	4.1
South	7	75.3
West	8	68.5
West	9	10.3
West	10	11.5
	All Regions	45.2

Source: Lucas et al. (1992).

Table 19-17. Percent of Residences With Basement, by Census Region

Census Region	Census Divisions	% of Residences With Basements
Northeast	1 New England	83.2
Northeast	2 Mid Atlantic	69.1
Midwest	3 East North Central	68.7
Midwest	4 West North Central	65.3
South	5 South Atlantic	27.0
South	6 East South Central	23.7
South	7 West South Central	2.8
West	8 Mountain	29.9
West	9 Pacific	10.9
	All Divisions	40.6

Source: U.S. EPA Analysis of U.S. DOE (2008a).

Table 19-18. States Associated With U.S. EPA Regions and Census Regions

U.S. EPA Regions			
Region 1	Region 4	Region 6	Region 8
Connecticut	Alabama	Arkansas	Colorado
Maine	Florida	Louisiana	Montana
Massachusetts	Georgia	New Mexico	North Dakota
New Hampshire	Kentucky	Oklahoma	South Dakota
Rhode Island	Mississippi	Texas	Utah
Vermont	North Carolina		Wyoming
	South Carolina	Region 7	
Region 2	Tennessee	Iowa	Region 9
New Jersey		Kansas	Arizona
New York	Region 5	Missouri	California
	Illinois	Nebraska	Hawaii
Region 3	Indiana		Nevada
Delaware	Michigan		
District of Columbia	Minnesota		Region 10
Maryland	Ohio		Alaska
Pennsylvania	Wisconsin		Idaho
Virginia			Oregon
West Virginia			Washington
U.S. Census Bureau Regions			
Northeast Region	Midwest Region	South Region	West Region
Connecticut	Illinois	Alabama	Alaska
Maine	Indiana	Arkansas	Arizona
Massachusetts	Iowa	Delaware	California
New Hampshire	Kansas	District of Columbia	Colorado
New Jersey	Michigan	Florida	Hawaii
New York	Minnesota	Georgia	Idaho
Pennsylvania	Missouri	Kentucky	Montana
Rhode island	Nebraska	Louisiana	Nevada
Vermont	North Dakota	Maryland	New Mexico
	Ohio	Mississippi	Oregon
	South Dakota	North Carolina	Utah
	Wisconsin	Oklahoma	Washington
		South Carolina	Wyoming
		Tennessee	
		Texas	
		Virginia	
		West Virginia	

Source: U.S. DOE (2008a).

Table 19-19. Percent of Residences With Certain Foundation Types by Census Region

Census Region	% of Residences[a] With Basement	With Crawlspace	With Concrete Slab
Northeast	72.9	18.9	24.5
Midwest	67.7	27.4	30.2
South	19.1	29.7	58.5
West	17.0	36.9	61.8
All Regions	40.6	28.7	46.0

[a] Percentage may add to more than 100 because more than one foundation type may apply to a given residence.

Source: U.S. EPA Analysis of U.S. DOE (2008a).

Table 19-20. Average Estimated Volumes[a] of U.S. Commercial Buildings, by Primary Activity

Primary Building Activity	*N*	Mean	SE of Mean	Percentiles					% of Total
				10th	25th	50th	75th	90th	
Vacant	134	4,789	581	408	612	1,257	3,823	11,213	3.7
Office	976	5,036	397	510	714	1,359	3,398	8,155	17.0
Laboratory	43	24,681	1,114	2,039	5,437	10,534	40,776	61,164	0.2
Non-refrigerated warehouse	473	9,298	992	1,019	1,812	2,945	7,504	16,990	12.0
Food sales	125	1,889	106	476	680	951	2,039	3,398	4.6
Public order and safety	85	5,253	482	816	1,019	1,699	3,398	8,495	1.5
Outpatient healthcare	144	3,537	251	680	1,019	2,039	3,398	6,966	2.5
Refrigerated warehouse	20	19,716	3,377	1,133	1,699	3,398	8,212	38,511	0.3
Religious worship	311	3,443	186	612	917	2,039	4,163	8,325	7.6
Public assembly	279	4,839	394	595	1,019	2,277	4,417	7,136	5.7
Education	649	8,694	513	527	867	2,379	10,194	23,786	7.9
Food service	242	1,889	112	442	680	1,189	2,039	3,568	6.1
Inpatient healthcare	217	82,034	5,541	17,330	25,485	36,019	95,145	203,881	0.2
Nursing	73	15,522	559	1,546	5,097	10,534	17,330	38,737	0.4
Lodging	260	11,559	1,257	527	1,376	4,078	10,194	27,184	2.5
Strip shopping mall	349	7,891	610	1,359	2,277	4,078	6,966	19,709	4.3
Enclosed mall	46	287,978	14,780	35,679	35,679	113,268	453,070	849,505	0.1
Retail other than mall	355	3,310	218	510	680	1,631	3,398	6,116	9.1
Service	370	2,213	182	459	629	934	2,039	4,587	12.8
Other	64	5,236	984	425	544	1,427	3,398	9,175	1.4
All Buildings[b]	5,215	5,575	256	527	816	1,699	4,248	10,194	100

[a] Volumes calculated from floor areas assuming a ceiling height of 12 feet for other structures and 20 feet for warehouses.

[b] Weighted average calculated from floor areas assuming a ceiling height of 12 feet for all buildings except warehouses and enclosed malls, which assumed 20-foot ceilings.

N = Number of observations.

SE = Standard error.

Source: U.S. EPA Analysis of U.S. DOE (2008b).

Table 19-21. Non-Residential Buildings: Hours per Week Open and Number of Employees

Primary Building Activity	*N*	%	Number of Hours/Week Open							Number of Employees During Main Shift						
			Mean	SE of Mean	Percentiles					Mean	SE of Mean	Percentiles				
					10th	25th	50th	75th	90th			10th	25th	50th	75th	90th
Vacant	134	2.8%	6.7	1.2	0	0	0	0	40	0.35	0.08	0	0	0	0	0
Office	976	20.2%	54.7	1.6	40	45	54	65	168	34.2	2.8	4	11	57	300	886
Laboratory	43	0.9%	103.5	0.8	50	58	98	168	168	105.6	4.5	20	55	156	300	435
Non-refrigerated warehouse	473	9.8%	66.2	4.8	20	40	55	80	168	7.0	0.9	0	1	8	25	64
Food sales	125	2.6%	107.3	2.5	60	80	109	127	168	6.3	0.5	1	2	4	15	50
Public order and safety	85	1.8%	103.0	7.6	10	40	168	168	168	19.1	2.2	1	4	15	60	200
Outpatient healthcare	144	3.0%	52.0	2.8	40	45	54	70	168	21.5	1.9	5	8	40	125	200
Refrigerated warehouse	20	0.4%	61.3	0.7	44	53	102	126	168	18.2	2.4	4	8	38	61	165
Religious worship	311	6.5%	32.0	2.4	5	13	40	60	79	4.6	0.5	1	1	3	10	19
Public assembly	279	5.8%	50.3	3.8	12	40	63	96	125	8.7	1.5	0	2	5	22	80
Education	649	13.5%	49.6	1.0	38	42	54	70	85	32.4	8.8	3	14	38	75	133
Food service	242	5.0%	85.8	2.6	40	66	84	105	130	10.5	0.9	2	4	8	15	33
Inpatient healthcare	217	4.5%	168.0	*	168	168	168	168	168	471.0	40.4	175	315	785	1,300	2,250
Nursing	73	1.5%	168.0	*	168	168	168	168	168	44.8	2.5	15	25	50	80	170
Lodging	260	5.4%	166.6	0.8	168	168	168	168	168	12.3	2.0	1	3	10	25	80
Retail other than mall	355	7.4%	59.1	1.5	42	50	62	80	105	7.8	0.7	2	3	6	22	72
Service	370	7.7%	55.0	2.1	40	40	50	68	105	5.9	0.6	1	2	4	10	35
Other	64	1.3%	57.8	7.1	12	40	51	90	168	12.3	1.7	1	2	10	44	150
All Activities	4,820	100.0%	61.2	1.2	30	45	60	98	168	15.7	1.2	1	3	14	66	300

* All sampled inpatient healthcare and nursing buildings reported being open 24 hours a day, 7 days a week.
N = Number of observations.
SE = Standard error.

Source: U.S. EPA Analysis of U.S. DOE (2008b).

Table 19-22. Non-Residential Heating Energy Sources for Non-Mall Buildings

	All Buildings[a]	Buildings With Space Heating	Space-Heating Energy Sources Used[b]					
			Electricity	Natural Gas	Fuel Oil	District Heat	Propane	Other[c]
All Buildings[a]	4,645	3,982	1,766	2,165	360	65	372	113
Building Floorspace (ft^2)								
1,001–5,000	54.9%	52.7%	50.3%	46.8%	54.4%	Q	65.3%	63.7%
5,001–10,000	19.1%	19.6%	19.8%	20.8%	23.9%	Q	19.4%	Q
10,001–25,000	15.9%	16.5%	17.6%	18.9%	12.8%	27.7%	10.2%	Q
25,001–50,000	5.2%	5.7%	6.5%	7.0%	3.1%	13.8%	3.0%	Q
50,001–100,000	2.8%	3.1%	3.4%	3.9%	2.2%	12.3%	Q	Q
100,001–200,000	1.4%	1.6%	1.6%	1.8%	2.5%	13.8%	Q	Q
200,001–500,000	0.5%	0.6%	0.6%	0.7%	1.1%	6.2%	Q	Q
Over 500,000	0.2%	0.2%	0.2%	0.2%	0.3%	3.1%	Q	Q
Principal Building Activity								
Education	8.3%	9.6%	10.2%	8.6%	5.8%	38.5%	9.7%	Q
Food Sales	4.9%	4.7%	5.5%	3.6%	Q	N/R	Q	Q
Food Service	6.4%	7.1%	7.1%	7.9%	Q	Q	8.3%	Q
Health Care	2.8%	3.1%	3.5%	3.1%	Q	3.1%	Q	Q
Lodging	3.1%	3.6%	5.8%	2.6%	4.4%	Q	Q	Q
Retail (Other Than Mall)	9.5%	10.2%	9.6%	10.9%	9.7%	Q	10.8%	Q
Office	17.7%	20.1%	21.5%	21.5%	12.8%	24.6%	9.7%	Q
Public Assembly	6.0%	6.5%	4.7%	6.5%	10.3%	9.2%	Q	Q
Public Order and Safety	1.5%	1.8%	1.4%	1.4%	Q	Q	Q	Q
Religious Worship	8.0%	9.0%	8.6%	9.6%	10.0%	Q	11.8%	N/R
Service	13.4%	12.9%	10.2%	12.3%	22.8%	Q	20.2%	60.2%
Warehouse and Storage	12.9%	7.9%	8.5%	8.2%	7.8%	Q	6.5%	Q
Other	1.7%	1.7%	1.8%	1.9%	Q	Q	Q	Q
Vacant	3.9%	1.7%	1.5%	1.8%	Q	Q	Q	Q
Year Constructed								
Before 1920	7.1%	7.6%	3.7%	8.5%	20.0%	Q	Q	Q
1920–1945	11.3%	11.1%	8.0%	14.3%	13.3%	18.5%	Q	Q
1946–1959	12.1%	12.4%	11.0%	12.9%	18.1%	20.0%	11.0%	Q
1960–1969	12.5%	13.2%	12.0%	13.0%	13.6%	20.0%	11.6%	Q
1970–1979	15.7%	16.3%	16.6%	16.6%	12.8%	9.2%	12.9%	39.8%
1980–1989	15.2%	15.5%	19.9%	12.5%	10.0%	6.2%	19.9%	Q
1990–1999	18.9%	18.1%	21.5%	17.2%	9.4%	12.3%	19.4%	Q
2000–2003	7.2%	5.9%	7.1%	4.9%	Q	Q	12.6%	Q
Census Region and Division								
Northeast	15.6%	16.9%	10.1%	16.0%	63.6%	26.2%	6.5%	Q
Midwest	27.3%	27.9%	20.2%	35.8%	16.4%	20.0%	38.7%	31.9%
South	38.2%	36.7%	50.0%	29.1%	14.2%	30.8%	36.6%	Q
West	18.9%	18.5%	19.7%	19.1%	6.1%	23.1%	18.0%	Q
Heating Equipment[b]								
Heat Pumps	10.2%	12.0%	26.4%	5.7%	1.7%	3.1%	7.5%	Q
Furnaces	40.1%	46.8%	31.4%	58.8%	52.2%	Q	57.0%	57.5%
Individual Space Heaters	17.6%	20.6%	34.2%	18.4%	21.9%	6.2%	32.8%	35.4%
District Heat	1.4%	1.6%	0.3%	0.2%	Q	100.0%	Q	N/R
Boilers	12.5%	14.5%	9.1%	18.3%	40.0%	Q	8.1%	15.9%
Packaged Heating Units	20.5%	23.9%	32.4%	24.4%	4.7%	4.6%	21.2%	Q

Table 19-22. Non-Residential Heating Energy Sources for Non-Mall Buildings (continued)

	All Buildings[a]	Buildings With Space Heating	Space-Heating Energy Sources Used[b]					
			Electricity	Natural Gas	Fuel Oil	District Heat	Propane	Other[c]
Other	4.4%	5.1%	6.6%	3.7%	10.0%	Q	10.8%	41.6%

[a] Figures in this table do not include enclosed malls and strip malls.
[b] More than one may apply.
[c] "Other" includes wood, coal, solar, and all other energy sources.
Q = Data withheld because the Relative Standard Error (RSE) was >50%, or <20 buildings were sampled.
N/R = No responding cases in sample.

Source: U.S. DOE (2008b).

Table 19-23. Non-Residential Air Conditioning Energy Sources for Non-Mall Buildings

	All Buildings[a]	Buildings With Cooling	Cooling Energy Sources[b]		
			Electricity	Natural Gas	District Chilled Water
All Buildings[a]	4,645	3,625	3,589	17	33
Building Floorspace (ft^2)					
1,001–5,000	54.9%	50.8%	51.2%	Q	Q
5,001–10,000	19.1%	20.2%	20.3%	Q	Q
10,001–25,000	15.9%	17.4%	17.2%	Q	Q
25,001–50,000	5.2%	6.0%	5.9%	Q	18.2%
50,001–100,000	2.8%	3.3%	3.2%	Q	15.2%
100,001–200,000	1.4%	1.7%	1.5%	Q	18.2%
200,001–500,000	0.5%	0.6%	0.6%	Q	6.1%
Over 500,000	0.2%	0.2%	0.1%	Q	3.0%
Principal Building Activity					
Education	8.3%	9.7%	9.4%	Q	42.4%
Food Sales	4.9%	5.8%	5.8%	N/R	N/R
Food Service	6.4%	7.8%	7.9%	Q	Q
Health Care	2.8%	3.6%	3.6%	0.0%	3.0%
Lodging	3.1%	3.6%	3.6%	Q	Q
Retail (Other Than Mall)	9.5%	11.2%	11.3%	Q	Q
Office	17.7%	21.8%	21.8%	Q	27.3%
Public Assembly	6.0%	5.9%	5.9%	Q	9.1%
Public Order and Safety	1.5%	1.7%	1.7%	Q	Q
Religious Worship	8.0%	8.5%	8.6%	Q	Q
Service	13.4%	10.2%	10.3%	Q	N/R
Warehouse and Storage	12.9%	7.3%	7.3%	Q	Q
Other	1.7%	1.6%	1.6%	Q	Q
Vacant	3.9%	1.4%	1.4%	N/R	Q
Year Constructed					
Before 1920	7.1%	6.4%	6.4%	Q	Q
1920–1945	11.3%	10.5%	10.6%	Q	Q
1946–1959	12.1%	11.9%	11.9%	Q	12.1%
1960–1969	12.5%	12.9%	12.8%	Q	12.1%
1970–1979	15.7%	16.8%	16.9%	Q	15.2%
1980–1989	15.2%	15.9%	15.9%	Q	15.2%
1990–1999	18.9%	19.2%	19.1%	Q	24.2%
2000–2003	7.2%	6.5%	6.5%	Q	Q
Census Region and Division					
Northeast	15.6%	14.3%	14.3%	41.2%	18.2%
Midwest	27.3%	26.4%	26.5%	Q	12.1%
South	38.2%	40.8%	40.9%	Q	42.4%
West	18.9%	18.5%	18.4%	Q	27.3%
Cooling Equipment[b]					
Central Air Conditioners	21.7%	27.8%	28.0%	Q	Q
Heat Pumps	10.6%	13.6%	13.7%	47.1%	3.0%
Individual Air Conditioners	16.0%	20.5%	20.7%	Q	6.1%
District Chilled Water	0.7%	0.9%	0.3%	Q	100.0%
Central Chillers	2.4%	3.1%	3.0%	29.4%	Q
Packaged A/C Units	34.7%	44.5%	44.9%	23.5%	12.1%
Swamp Coolers	2.6%	3.4%	3.4%	Q	Q
Other	0.9%	1.1%	0.8%	Q	Q

[a] Figures in this table do not include enclosed malls and strip malls.

[b] More than one may apply.

Q = Data withheld because the Relative Standard Error (RSE) was >50%, or <20 buildings were sampled.

N/R = No responding cases in sample.

Source: U.S. DOE (2008b).

Table 19-24. Summary Statistics for Residential Air Exchange Rates (in ACH),[a] by Region

	West Region	Midwest Region	Northeast Region	South Region	All Regions
Arithmetic Mean	0.66	0.57	0.71	0.61	0.63
Arithmetic Standard Deviation	0.87	0.63	0.60	0.51	0.65
Geometric Mean	0.47	0.39	0.54	0.46	0.46
Geometric Standard Deviation	2.11	2.36	2.14	2.28	2.25
10^{th} Percentile	0.20	0.16	0.23	0.16	0.18
50^{th} Percentile	0.43	0.35	0.49	0.49	0.45
90^{th} Percentile	1.25	1.49	1.33	1.21	1.26
Maximum	23.32	4.52	5.49	3.44	23.32

[a]ACH = Air changes per hour.

Source: Koontz and Rector (1995).

Table 19-25. Summary of Major Projects Providing Air Exchange Measurements in the PFT Database

Project Code	State	Month(s)[a]	Number of Measurements	Mean Air Exchange Rate (ACH)	SD[b]	Percentiles				
						10th	25th	50th	75th	90th
ADM	CA	5–7	29	0.70	0.52	0.29	0.36	0.48	0.81	1.75
BSG	CA	1, 8–12	40	0.53	0.30	0.21	0.30	0.40	0.70	0.90
GSS	AZ	1–3, 8–9	25	0.39	0.21	0.16	0.23	0.33	0.49	0.77
FLEMING	NY	1–6, 8–12	56	0.24	0.28	0.05	0.12	0.22	0.29	0.37
GEOMET1	FL	1,6–8, 10–12	18	0.31	0.16	0.15	0.18	0.25	0.48	0.60
GEOMET2	MD	1–6	23	0.59	0.34	0.12	0.29	0.65	0.83	0.92
GEOMET3	TX	1–3	42	0.87	0.59	0.33	0.51	0.71	1.09	1.58
LAMBERT1	ID	2–3, 10–11	36	0.25	0.13	0.10	0.17	0.23	0.33	0.49
LAMBERT2	MT	1–3, 11	51	0.23	0.15	0.10	0.14	0.19	0.26	0.38
LAMBERT3	OR	1–3, 10–12	83	0.46	0.40	0.19	0.26	0.38	0.56	0.80
LAMBERT4	WA	1–3, 10–12	114	0.30	0.15	0.14	0.20	0.30	0.39	0.50
LBL1	OR	1–4, 10–12	126	0.56	0.37	0.28	0.35	0.45	0.60	1.02
LBL2	WA	1–4, 10–12	71	0.36	0.19	0.18	0.25	0.32	0.42	0.52
LBL3	ID	1–5, 11–12	23	1.03	0.47	0.37	0.73	0.99	1.34	1.76
LBL4	WA	1–4, 11–12	29	0.39	0.27	0.14	0.18	0.36	0.47	0.63
LBL5	WA	2–4	21	0.36	0.21	0.13	0.19	0.30	0.47	0.62
LBL6	ID	3–4	19	0.28	0.14	0.11	0.17	0.26	0.38	0.55
NAHB	MN	1–5, 9–12	28	0.22	0.11	0.11	0.16	0.20	0.24	0.38
NYSDH	NY	1–2, 4, 12	74	0.59	0.37	0.28	0.37	0.50	0.68	1.07
PEI	MD	3–4	140	0.59	0.45	0.15	0.26	0.49	0.83	1.20
PIERCE	CT	1–3	25	0.80	1.14	0.20	0.22	0.38	0.77	2.35
RTI1	CA	2	45	0.90	0.73	0.38	0.48	0.78	1.08	1.52
RTI2	CA	7	41	2.77	2.12	0.79	1.18	2.31	3.59	5.89
RTI3	NY	1–4	397	0.55	0.37	0.26	0.33	0.44	0.63	0.94
SOCAL1	CA	3	551	0.81	0.66	0.29	0.44	0.66	0.94	1.43
SOCAL2	CA	7	408	1.51	1.48	0.35	0.59	1.08	1.90	3.11
SOCAL3	CA	1	330	0.76	1.76	0.26	0.37	0.48	0.75	1.11
UMINN	MN	1–4	35	0.36	0.32	0.17	0.20	0.28	0.40	0.56
UWISC	WI	2–5	57	0.82	0.76	0.22	0.33	0.55	1.04	1.87

[a] 1 = January, 2 = February, etc.
[b] SD = Standard deviation.

Source: Adapted from Versar (1990).

Table 19-26. Distributions of Residential Air Exchange Rates (in ACH)[a] by Climate Region and Season

Climate Region[b]	Season	Sample Size	Arithmetic Mean	Standard Deviation	Percentiles				
					10th	25th	50th	75th	90th
Coldest	Winter	161	0.36	0.28	0.11	0.18	0.27	0.48	0.71
	Spring	254	0.44	0.31	0.18	0.24	0.36	0.53	0.80
	Summer	5	0.82	0.69	0.27	0.41	0.57	1.08	2.01
	Fall	47	0.25	0.12	0.10	0.15	0.22	0.34	0.42
Colder	Winter	428	0.57	0.43	0.21	0.30	0.42	0.69	1.18
	Spring	43	0.52	0.91	0.13	0.21	0.24	0.39	0.83
	Summer	2	1.31	-	-	-	-	-	-
	Fall	23	0.35	0.18	0.15	0.22	0.33	0.41	0.59
Warmer	Winter	96	0.47	0.40	0.19	0.26	0.39	0.58	0.78
	Spring	165	0.59	0.43	0.18	0.28	0.48	0.82	1.11
	Summer	34	0.68	0.50	0.27	0.36	0.51	0.83	1.30
	Fall	37	0.51	0.25	0.30	0.30	0.44	0.60	0.82
Warmest	Winter	454	0.63	0.52	0.24	0.34	0.48	0.78	1.13
	Spring	589	0.77	0.62	0.28	0.42	0.63	0.92	1.42
	Summer	488	1.57	1.56	0.33	0.58	1.10	1.98	3.28
	Fall	18	0.72	1.43	0.22	0.25	0.42	0.46	0.74

[a] ACH = air changes per hour.

[b] The coldest region was defined as having 7,000 or more heating degree days, the colder region as 5,500–6,999 degree days, the warmer region as 2,500–5,499 degree days, and the warmest region as fewer than 2,500 degree days.

- Few observations for summer results in colder regions. Data not available.

Source: Murray and Burmaster (1995).

Table 19-27. Air Exchange Rates in Commercial Buildings by Building Type

Building Type	*N*	Mean (ACH[a])	SD	10th Percentile	Range (ACH)
Educational	7	1.9			0.8 to 3.0
Office (<100,000 ft^2)	8	1.5			0.3 to 4.1
Office (>100,000 ft^2)	14	1.8			0.7 to 3.6
Libraries	3	0.6			0.3 to 1.0
Multi-use	5	1.4			0.6 to 1.9
Naturally ventilated	3	0.8			0.6 to 0.9
Total (all commercial)	40	1.5	0.87	0.60[b]	0.3 to 4.1

[a] ACH = air changes per hour.

[b] Calculated from data presented in Turk et al. (1987), Table IV.C.1.

N = Number of observations.
SD = Standard deviation.

Source: Turk et al. (1987).

Table 19-28. Statistics of Estimated Normalized Leakage Distribution Weighted for All Dwellings in the United States

House Code	Estimated Normalized Leakage Percentiles							Estimated	
	5th	10th	25th	50th	75th	90th	95th	GM	GSD
Low income	0.30	0.39	0.62	0.98	1.5	2.2	2.7	0.92	1.9
Conventional	0.17	0.21	0.31	0.48	0.75	1.1	1.4	0.49	1.9
Whole U.S.	0.17	0.22	0.33	0.52	0.84	1.3	1.7	0.54	2.0

GM = Geometric mean.
GSD = Geometric standard deviation.

Source: Chan et al. (2005).

Table 19-29. Particle Deposition During Normal Activities

Particle Size Range	Particle Removal Rate ($hour^{-1}$)
1–5	0.5
5–10	1.4
10–25	2.4
>25	4.1

Source: Adapted from Thatcher and Layton (1995).

Table 19-30. Deposition Rates for Indoor Particles

Size Fraction	Deposition Rate ($hour^{-1}$)
$PM_{2.5}$	0.39
PM_{10}	0.65
Coarse	1.0

Source: Adapted from Wallace (1996).

Table 19-31. Measured Deposition Loss Rate Coefficients (hour^{-1})

Median Particle Diameter (µm)	Fans Off			Room Core Airspeed 5.4 cm/second			Room Core Airspeed 14.2 cm/s			Room Core Airspeed 19.1 cm/second		
	Bare room surfaces	Carpeted room	Fully furnished	Bare room surfaces	Carpeted room	Fully furnished	Bare room surfaces	Carpeted room	Fully furnished	Bare room surfaces	Carpeted room	Fully furnished
0.55	1.10	0.12	0.20	0.10	0.13	0.23	0.09	0.18	0.23	0.14	0.16	0.27
0.65	0.10	0.12	0.20	0.10	0.13	0.23	0.10	0.19	0.24	0.14	0.17	0.28
0.81	0.10	0.11	0.19	0.10	0.15	0.24	0.11	0.19	0.27	0.15	0.19	0.30
1.00	0.13	0.12	0.21	0.12	0.20	0.28	0.15	0.23	0.33	0.20	0.25	0.38
1.24	0.20	0.18	0.29	0.18	0.28	0.38	0.25	0.34	0.47	0.33	0.38	0.53
1.54	0.32	0.28	0.42	0.27	0.39	0.54	0.39	0.51	0.67	0.51	0.59	0.77
1.91	0.49	0.44	0.61	0.42	0.58	0.75	0.61	0.78	0.93	0.80	0.89	1.11
2.37	0.78	0.70	0.93	0.64	0.84	1.07	0.92	1.17	1.32	1.27	1.45	1.60
2.94	1.24	1.02	1.30	0.92	1.17	1.46	1.45	1.78	1.93	2.12	2.27	2.89
3.65	1.81	1.37	1.93	1.28	1.58	1.93	2.54	2.64	3.39	3.28	3.13	3.88
4.53	2.83	2.13	2.64	1.95	2.41	2.95	3.79	4.11	4.71	4.55	4.60	5.46
5.62	4.41	2.92	3.43	3.01	3.17	3.51	4.88	5.19	5.73	6.65	5.79	6.59
6.98	5.33	3.97	4.12	4.29	4.06	4.47	6.48	6.73	7.78	10.6	8.33	8.89
8.66	6.79	4.92	5.45	6.72	5.55	5.77	8.84	8.83	10.5	12.6	11.6	11.6

Source: Thatcher et al. (2002).

Table 19-32. Total Dust Loading for Carpeted Areas

Household	Total Dust Load (g/m^2)	Fine Dust (<150 µm) Load (g/m^2)
1	10.8	6.6
2	4.2	3.0
3	0.3	0.1
4	2.2; 0.8	1.2; 0.3
5	1.4; 4.3	1.0; 1.1
6	0.8	0.3
7	6.6	4.7
8	33.7	23.3
9	812.7	168.9

Source: Adapted from Roberts et al. (1991).

Table 19-33. Particle Deposition and Resuspension During Normal Activities		
Particle Size Range (μm)	Particle Deposition Rate ($hour^{-1}$)	Particle Resuspension Rate ($hour^{-1}$)
0.3–0.5	(not measured)	9.9×10^{-7}
0.6–1	(not measured)	4.4×10^{-7}
1–5	0.5	1.8×10^{-5}
5–10	1.4	8.3×10^{-5}
10–25	2.4	3.8×10^{-4}
>25	4.1	3.4×10^{-5}
Source: Adapted from Thatcher and Layton (1995).		

Table 19-34. Dust Mass Loading After 1 Week Without Vacuum Cleaning	
Location in Test House	Dust Loading (g/m^2)
Tracked area of downstairs carpet	2.20
Untracked area of downstairs carpet	0.58
Tracked area of linoleum	0.08
Untracked area of linoleum	0.06
Tracked area of upstairs carpet	1.08
Untracked area of upstairs carpet	0.60
Front doormat	43.34
Source: Adapted from Thatcher and Layton (1995).	

Table 19-35. Simplified Source Descriptions for Airborne Contaminants

Description	Components	Dimensions
Direct emission rate		
Combustion emission rate	$E_f H_f M_f$	g hour^{-1}
	E_f = emission factor	g J^{-1}
	H_f = fuel content	J mol^{-1}
	M_f = fuel consumption rate	mol hour^{-1}
Volume emission rate	$Q_p C_{p\_} \varepsilon$	g hour^{-1}
	Q_p = volume delivery rate	m^3 hour^{-1}
	C_p = concentration in carrier	g m^{-3}
	ε = transfer efficiency	g g^{-1}
Mass emission rate	$M_p w_e \varepsilon$	g hour^{-1}
	M_p = mass delivery rate	g hour^{-1}
	w_e = weight fraction	g g^{-1}
	ε = transfer efficiency	g g^{-1}
Diffusion limited emission rate	$(D_f \delta^{-1})(C_s - C_i)A_i$	g hour^{-1}
	D_f = diffusivity	m^2 hour^{-1}
	δ^{-1} = boundary layer thickness	meters
	C_s = vapor pressure of surface	g m^{-3}
	C_i = room concentration	g m^{-3}
	A_i = area	m^2
Exponential emission rate	$A_i E_o \, e^{-k t}$	g hour^{-1}
	A_i = area	m^2
	E_o = initial unit emission rate	g hour^{-1} m^{-2}
	k = emission decay factor	hour^{-1}
	t = time	hours
Transport		
Infiltration	$Q_{ji} C_j$	g hour^{-1}
Interzonal	Q_{ji} = air flow from zone j	m^3 hour^{-1}
Soil gas	C_j = air concentration in zone j	g m^{-3}

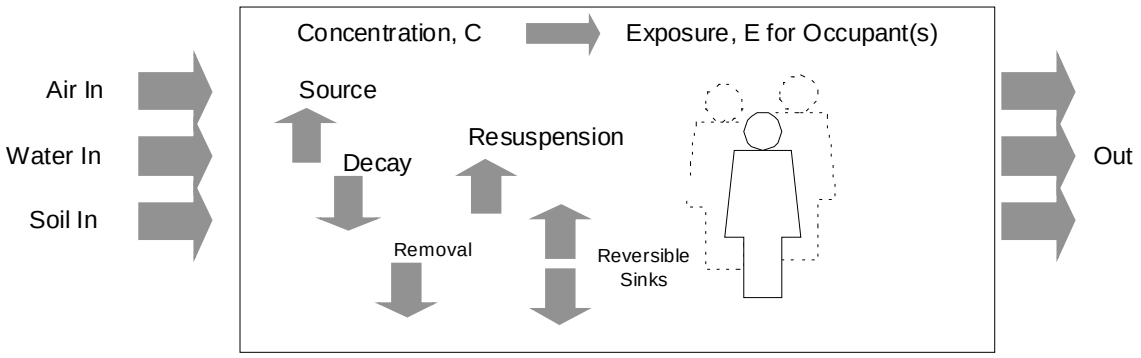

Figure 19-1. Elements of Residential Exposure.

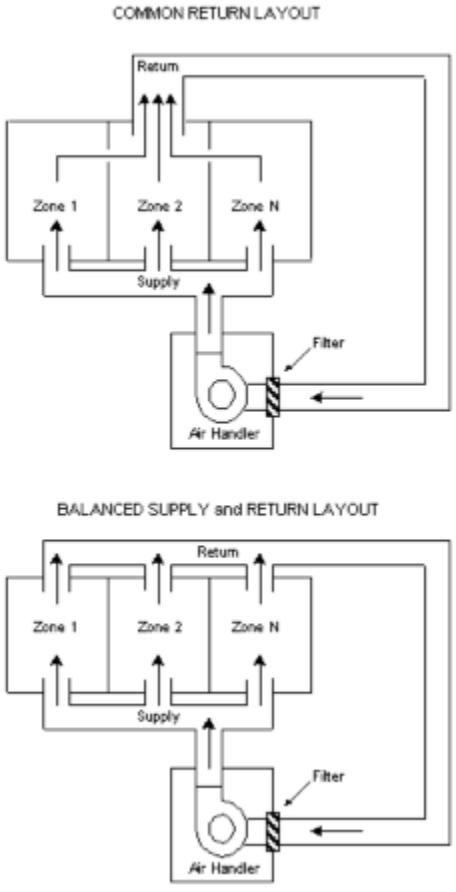

Figure 19-2. Configuration for Residential Forced-Air Systems.

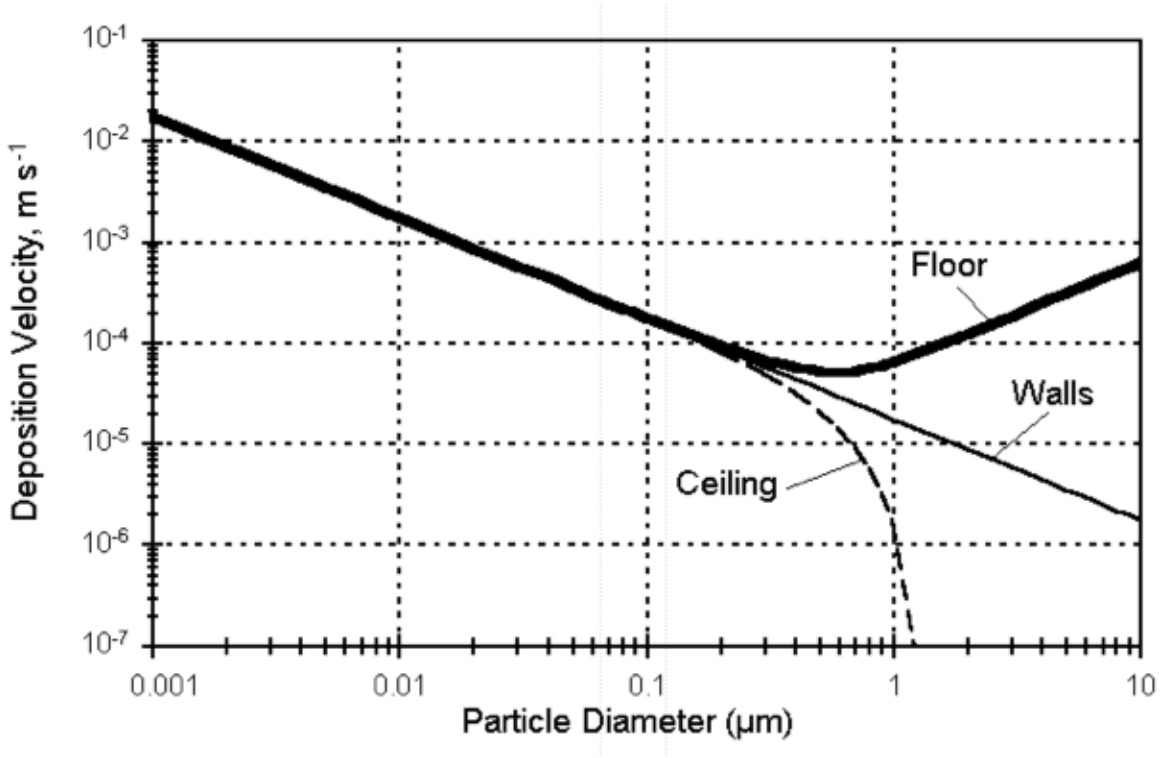

Figure 19-3. Idealized Patterns of Particle Deposition Indoors.

Source: Adapted from Nazaroff and Cass (1989b).

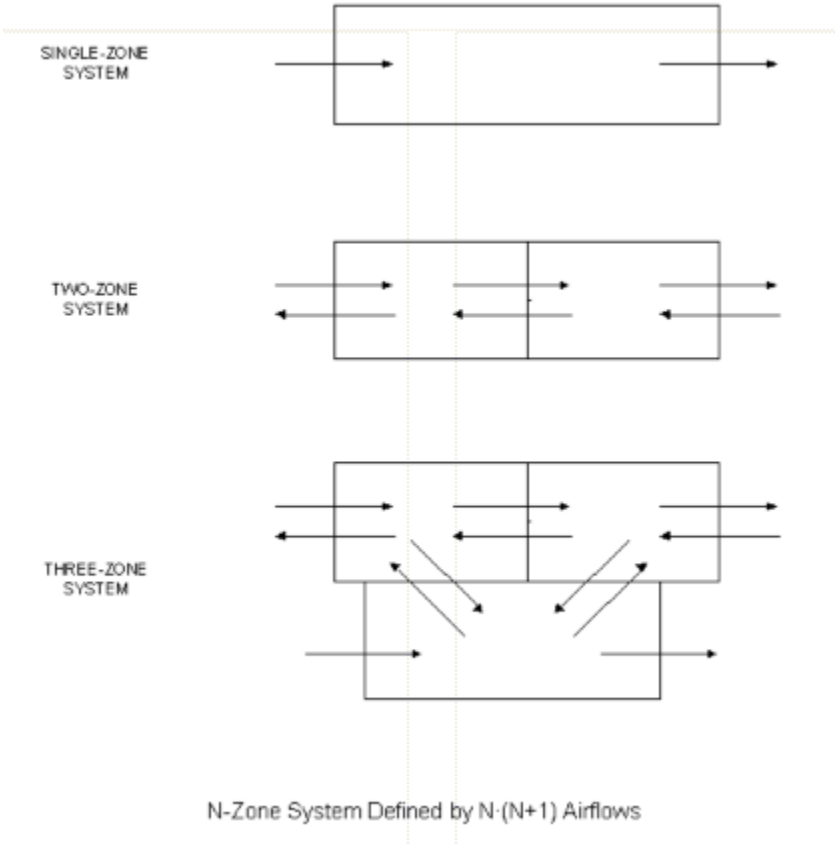

Figure 19-4. Air Flows for Multiple-Zone Systems.

GLOSSARY OF TERMS

Absorbed dose—The amount of an agent that enters a target by crossing an exposure surface that acts as an absorption barrier. See also ***Absorption barrier, Dose, and Internal dose.***

Absorption barrier—Any exposure surface that may retard the rate of penetration of an agent into a target. Examples include the skin, respiratory tract lining, and gastrointestinal tract wall.

Activity pattern data—Information on human activities used in exposure assessments. These may include a description of the activity, frequency of activity, duration spent performing the activity, and the microenvironment in which the activity occurs.

Acute exposure—A single exposure to a toxic substance which may result in severe biological harm or death. Acute exposures are usually characterized as lasting no longer than a day, as compared to longer, continuing exposure over a period of time.

Adherence factor—The amount of a material (e.g., soil) that adheres to the skin per unit of surface area.

Activity pattern (time use) data—Information on activities in which various individuals engage, length of time spent performing various activities, locations in which individuals spend time and length of time spent by individuals within those various environments.

Age dependent adjustment factor (ADAF)—In cases where age-related differences in toxicity occur, differences in both toxicity and exposure need to be integrated across all relevant age intervals, by the use of age dependent potency adjustment factors (ADAFs). This is a departure from the way cancer risks have historically been calculated based upon the premise that risk is proportional to the daily average of the long-term adult dose.

Agent—Refers to a chemical, biological, or physical entity that contacts a ***target***.

Aggregate exposure—The combined exposure of an individual (or defined population) to a specific agent or stressor via relevant routes, pathways, and sources. Total exposure can include exposure through multiple routes (e.g., dermal, inhalation, and ingestion).

Agricultural commodity—Used by U.S. EPA to mean plant (or animal) parts consumed by humans as food. When such items are raw or unprocessed, they are referred to as "raw agricultural commodities."

Air exchange rate—Rate of air leakage through windows, doorways, intakes and exhausts, and "adventitious openings" (i.e., cracks and seams) that combine to form the leakage configuration of the building envelope plus natural and mechanical ventilation.

All water sources—Includes water from all supply sources such as community water supply (i.e., tap water), bottled water, etc.

Analytical uncertainty propagation—Examining how uncertainty in individual parameters affects the overall uncertainty of the exposure assessment.

Anthropometric—The study of human body measurements for use in anthropological classification and comparison.

As-consumed intake—Intake rate based on the weight of the food in the form that it is consumed (e.g., cooked or prepared).

Assessment—A determination or appraisal of possible consequences resulting from an analysis of data.

Average Daily Dose (ADD)—The mean amount of an agent to which a person is exposed on a daily basis, often averaged over a long period of time. U.S. EPA is transitioning from average daily dose methodologies to more refined aggregate and cumulative approaches for estimating exposure across each lifestage. See also ***Lifetime average daily dose (LADD)*** and ***Time-averaged exposure*.**

Bayesian Analysis—Bayesian analysis is a method of statistical inference in which the knowledge of prior events is used to predict future events. Bayes' Theorem is a means of quantifying uncertainty.

Benchmark Dose or Concentration—An exposure due to a dose or concentration of a substance associated with a specified low incidence of risk, generally in the range of 1% to 10%, of a health effect; or the dose or concentration associated with a specified measure or change of a biological effect.

Best Tracer Method (BTM)—Method for estimating soil ingestion that allows for the selection of the most recoverable tracer for a particular subject or group of subjects. Selection of the best tracer is made on the basis of the food/soil (F/S) ratio.

Bioaccumulate—The increase in concentration in living organisms as they take in contaminated air, water, or food because the substances are very slowly metabolized or excreted.

Bias—A systematic error inherent in a method or caused by some feature of the measurement system.

Bioavailability—The rate and extent to which an agent can be absorbed by an organism and is available for metabolism or interaction with biologically significant receptors. Bioavailability involves both release from a medium (if present) and absorption by an organism.

Bioconcentrate—The accumulation of a chemical in tissues of a fish or other organism to levels greater than in the surrounding medium.

Biokinetic model comparison—A methodology that compares direct measurements of a biomarker such as blood or urine levels of a toxicant with predictions from a biokinetic model.

Biological marker or biomarker—An indicator of changes or events in biological systems. Biological markers of exposure are cellular, biochemical, analytical, or molecular measures that are obtained from biological media such as tissues, cells, or fluids and are indicative of exposure to an agent. Biomarkers of effect are quantifiable changes, indicating exposure to a compound, while biomarkers of susceptibility are characteristics that make an individual susceptible to the effects of an exposure.

Biomarker model comparison—A methodology that compares results from a biokinetic exposure model to biomarker measurements children blood. The method is used to confirm assumptions about ingested soil and dust quantities in this handbook.

Basal Metabolic Rate (BMR)—Minimum level of energy required to maintain normal body functions.

Body Mass Index (BMI)—The ratio of weight and height squared.

Bootstrap—A statistical method of resampling data use to estimate variance and bias of an estimator and provide confidence intervals for parameters.

Bounding estimate—An estimate of exposure, dose, or risk that is higher or lower than that incurred by the person with the highest or lowest exposure, dose, or risk in the population being assessed. Bounding estimates are useful in developing statements that exposures, doses, or risks are "not greater than" or “less than” the estimated value, because assumptions are used which define the likely bounding conditions.

Central tendency exposure—A measure of the middle or the center of an exposure distribution. The mean is the most commonly used measure of central tendency.

Chronic exposure—Repeated exposure by the oral, dermal, or inhalation route for more than approximately 10% of the life span in humans (more than approximately 90 days to 2 years in typically used laboratory animal species).

Chronic intake—The long term period over which a substance crosses the outer boundary of an organism without passing an absorption barrier.

Classical statistical methods—Estimating the population exposure distribution directly, based on measured values from a representative sample**.**

Coating—Method used to measure skin surface area, in which either the whole body or specific body regions are coated with a substance of known density and thickness.

Community water—Includes tap water ingested from community or municipal water supply.

Comparability—The ability to describe likenesses and differences in the quality and relevance of two or more data sets.

Concentration—Amount of a material or agent dissolved or contained in unit quantity in a given medium or system.

Confidence intervals—An estimated range of values with a given probability of including the population parameter of interest. The range of values is usually based on the results of a sample that estimated the mean and the sampling error or standard error.

Consumer-only intake rate—The average quantity of food consumed per person in a population composed only of individuals who ate the food item of interest during a specified period.

Contact boundary—The surface on a ***target*** where an *agent* is present. Examples of outer exposure surfaces include the exterior of an eyeball, the skin surface, and a conceptual surface over the nose and open mouth. Examples of inner exposure surfaces include the gastrointestinal tract, the respiratory tract, and the urinary tract lining. As an exposure surface gets smaller, the limit is an ***exposure point***. It is also referred to as an ***exposure surface***.

Contaminant concentration—Contaminant concentration is the concentration of the contaminant in the medium (air, food, soil, etc.) contacting the body and has units of mass/volume or mass/mass.

Creel study—A study in which fishermen are interviewed while fishing.

Cumulative exposure—Exposure via mixtures of contaminants both indoors and outdoors. Exposure may also occur through more than one pathway. New directions in risk assessments in U.S. EPA put more emphasis on total exposures via multiple pathways.

Deposition—The removal of airborne substances to available surfaces that occurs as a result of gravitational settling and diffusion, as well as electrophoresis and thermophoresis.

Dermal absorption—A route of exposure by which substances can enter the body through the skin.

Dermal adherence—The loading of a substance onto the outer surface of the skin.

Diary study—Survey in which individuals are asked to record food intake, activities, or other factors in a diary which is later used to evaluate exposure factors associated with specific populations.

Direct water ingestion—Consumption of plain water as a beverage. It does not include water used for preparing beverages such as coffee or tea.

Distribution—A set of values derived from a specific population or set of measurements that represents the range and array of data for the factor being studied.

Doers—Survey respondents who report participating in a specified activity.

Dose—The amount of an agent that enters a target after crossing an exposure surface. If the exposure surface is an absorption barrier, the dose is an ***absorbed dose***. If the exposure surface is not an absorption barrier, the dose is an ***intake dose***.

Dose rate—Dose per unit time.

Dose-response assessment—Analysis of the relationship between the total amount of an agent administered to, taken up by, or absorbed by an organism, system, or target population and the changes developed in that organism, system, or target population in reaction to that agent, and inferences derived from such an analysis with respect to the entire population. Dose-response assessment is the second of four steps in risk assessment.

Dose-response curve—Graphical presentation of a dose-response relationship.

Dose-response relationship—The resulting biological responses in an organ or organism expressed as a function of a series of doses.

Dressed weight—The portion of the harvest brought into kitchens for use, including bones for particular species.

Drinking water— All fluids consumed by individuals to satisfy body needs for internal water.

Dry-weight intake rates—Intake rates that are based on the weight of the food consumed after the moisture content has been removed.

Dust Ingestion—Consumption of dust that results from various behaviors including, but not limited to, mouthing objects or hands, eating dropped food, consuming dust directly, or inhaling dust that passes from the respiratory system into the gastrointestinal tract.

Effect—Change in the state or dynamics of an organism, system, or (sub) population caused by exposure to an agent.

Employer tenure—The length of time a worker has been with the same employer.

Energy expenditures—The amount of energy expended by an individual during activities.

Exclusively breast fed—Infants whose sole source of milk comes from human milk with no other milk substitutes.

Exposed foods—Foods grown above ground.

Exposure—Contact between an agent and a target.

Exposure assessment—The process of estimating or measuring the magnitude, frequency, and duration of exposure to an agent, along with the number and characteristics of the population exposed.

Exposure concentration—The concentration of a chemical in its transport or carrier medium at the point of contact.

Exposure duration—Length of time over which contact with the contaminant lasts.

Exposure event—The occurrence of continuous contact between an agent and a target.

Exposure factor—Factors related to human behavior and characteristics that help determine an individual's exposure to an agent.

Exposure frequency—The number of exposure events in an exposure duration.

Exposure loading—The exposure mass divided by the exposure surface area. For example, a dermal exposure measurement based on a skin wipe sample, expressed as a mass of residue per skin surface area, is an exposure loading.

Exposure pathway—The physical course a chemical takes from the source to the organism exposed.

Exposure route—The way a chemical pollutant enters an organism after contact, e.g., by ingestion, inhalation, or dermal absorption.

Exposure scenario—A set of facts, assumptions, and interferences about how exposure takes place that aids the exposure assessor in evaluating estimating, or quantifying exposures.

Exposure surface—See contact boundary.

Fate—Pattern of distribution of an agent, its derivatives, or metabolites in an organism, system, compartment, or population of concern as a result of transport, partitioning, transformation, or degradation.

Foremilk—Milk produced at the beginning of breastfeeding.

General population—The total of individuals inhabiting an area or making up a whole group.

Geographic information system (GIS)—GIS is a system of hardware and software that captures, stores, analyzes, manages, and presents geographic data.

Geometric mean—The n^{th} root of the product of n values.

Geophagy—A form of soil ingestion involving the intentional ingestion of earths, usually associated with cultural practices.

Hazard—Inherent property of an agent or situation having the potential to cause adverse effects when an organism, system, or population is exposed to that agent.

Hazard assessment—A process designed to determine the possible adverse effects of an agent or situation to which an organism, system, or target population could be exposed. The process typically includes hazard identification, dose-response evaluation and hazard characterization. The process focuses on the hazard, in contrast to risk assessment, where exposure assessment is a distinct additional step.

High-end exposure—An estimate of individual exposure or dose for those persons at the upper end of an exposure or dose distribution, conceptually above the 90^{th} percentile, but not higher than the individual in the population who has the highest exposure or dose. See also Bounding estimate.

Hindmilk—Milk produced at the end of the breastfeeding.

Home-produced foods—Fruits and vegetables produced by home gardeners, meat and dairy products derived form consumer-raised livestock, game meat, and home caught fish.

Human Equivalent Concentration or Dose—The human concentration (for inhalation exposure) or dose (for other routes of exposure) of an agent that is believed to induce the same magnitude of toxic effect as the experimental animal species concentration or dose. This adjustment may incorporate toxicokinetic information on the particular agent, if available, or use a default procedure, such as assuming that daily oral doses experienced for a lifetime are proportional to body weight raised to the 0.75 power.

Indirect water ingestion—Includes water added during food preparation, but not water intrinsic to purchased foods. Indirect water includes for example, water used to prepare baby formulas, cake mix, and concentrated orange juice.

Indoor settled dust—Particles in building interiors that have settled onto objects, surfaces, floors, and carpeting. These particles may include soil particles that have been tracked into the indoor environment from outdoors.

Infiltration—Air leakage through random cracks, interstices, and other unintentional openings in the building envelope.

Inhalation dosimetry—Process of measuring or estimating inhaled dose.

Inhalation unit risk—The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 $\mu g/m^3$ in air for a lifetime.

Inhaled dose—The amount of an inhaled substance that is available for interaction with metabolic processes or biologically significant receptors after crossing the outer boundary of an organism.

Insensible water loss—Evaporative water losses that occur during breastfeeding. Corrections are made to account for insensible water loss when estimating breast milk intake using the test weighing method.

Intake—The process by which a substance crosses the outer boundary of an organism without passing an absorption barrier (e.g., through ingestion or inhalation).

Intake dose—The amount of an agent that enters a target by crossing an exposure surface that does not act as an absorption barrier. See also ***Absorption barrier*** and ***Dose.***

Intake rate—Rate of inhalation, ingestion, and dermal contact depending on the route of exposure. For ingestion, the intake rate is simply the amount of food containing the contaminant of interest that an individual ingests during some specific time period (units of mass/time). For inhalation, the intake rate is the rate at which contaminated air is inhaled. Factors that affect dermal exposure are the amount of material that comes into contact with the skin, and the rate at which the contaminant is absorbed.

Inter-individual variability—Variations between individuals in terms of human characteristics such as age or body weight, or behaviors such as location, activity patterns, and ingestion rates.

Internal dose—The amount of an agent that enters a target by crossing an exposure surface that acts as an absorption barrier. Synonymous with absorbed dose. See also ***Absorption barrier and Dose.***

Interzonal air flows—Transport of air through doorways, ductwork, and service chaseways that interconnect rooms or zones within a building.

Intra-individual variability—Fluctuations in an individual's physiologic (e.g., body weight), or behavioral characteristics (e.g., ingestion rates or activity patterns).

Key study—A study that is the most up-to-date and scientifically sound for deriving recommendations for exposure factors. Alternatively, studies may be classified as "relevant" and not "key" for one or more of the following: (1) they provide supporting data (e.g., older studies on food intake that may be useful for trend analysis); (2) they provide information related to the factor of interest (e.g., data on prevalence of breast feeding); or (3) the study design or approach makes the data less applicable for exposure assessment purposes (e.g., studies with small sample size, studies not conducted in the United States). As new data or analyses are published, "key" studies may be moved to the "relevant" category because they are replaced by more up-to-date data or an analysis of improved quality.

Lead isotope ratio methodology—A method that measures different lead isotopes in children's blood and/or urine, food, water, and house dust and compares the ratio of these isotopes to infer sources of lead exposure that may include dust or other environmental exposures.

Life expectancy—The length of an individual's life.

Lifestage—A distinguishable time frame in an individual's life characterized by unique and relatively stable behavioral and/or physiological characteristics that are associated with development and growth.

Lifetime Average Daily Dose (LADD)—Dose rate averaged over a lifetime. The LADD is used for compounds with carcinogenic or chronic effects. The LADD is usually expressed in terms of mg/kg-day or other mass/mass-time units. Often used in carcinogen risk assessments that employ linear low-dose extrapolation methods. See also ***Average daily dose*** and ***Time-averaged exposure***.

Limiting Tracer Method (LTM)—Method for evaluating soil ingestion that assumes that the maximum amount of soil ingested corresponds with the lowest estimate from various tracer elements.

Local circulation—Convective and adjective air circulation and mixing within a room or within a zone.

Long-term exposure—Repeated exposure for more than 30 days, up to approximately 10% of the life span in humans (more than 30 days).

Lowest-Observed-Adverse-Effect Level (LOAEL)—The lowest exposure level at which there are biologically significant increases in frequency or severity of adverse effects between the exposed population and its appropriate control group.

Margin of safety—For some experts, margin of safety has the same meaning as margin of exposure, while for others, margin of safety means the margin between the reference dose and the actual exposure.

Mass-balance/tracer techniques—Method for evaluating soil intake that accounts for both inputs and outputs of tracer elements. Tracers in soil, food, medicine and other ingested items as well as in feces and urine are accounted for.

Mean value—Simple or arithmetic average of a range of values, computed by dividing the total of all values by the number of values.

Measurement error—A systematic error arising from inaccurate measurement (or classification) of subjects on the study variables.

Measurement end-point—Measurable (ecological) characteristic that is related to the valued characteristic chosen as an assessment point.

Mechanical ventilation—Controlled air movement driven by fans. Also referred to as forced ventilation.

Median value—The value in a measurement data set such that half the measured values are greater and half are less.

Metabolic Equivalent of Work (MET)—A dimensionless energy expenditure metric used to represent an activity level.

Microenvironment—Surroundings that can be treated as homogeneous or well characterized in the concentrations of an agent (e.g., home, office, automobile, kitchen, store).

Mode of action—Defined as a sequence of key events and processes, starting with interaction of an agent with a cell, proceeding through operational and anatomical changes, and resulting in cancer formation.

Model uncertainty—Uncertainty regarding gaps in scientific theory required to make predictions on the basis of causal inferences.

Moisture content—The portion of foods made up by water. The percent water is needed for converting food intake rates and residue concentrations between whole-weight and dry-weight values.

Monte Carlo technique—A repeated random sampling from the distribution of values for each of the parameters in a generic (exposure or dose) equation to derive an estimate of the distribution of (exposures or doses in) the population.

Mouthing behavior—Activities in which objects, including fingers, are touched by the mouth or put into the mouth except for eating and drinking, and includes licking, sucking, chewing, and biting.

Natural ventilation—Airflow through open windows, doors, and other designed openings in the building envelope.

Non-dietary ingestion— Ingestion of non-food substances, typically resulting from the mouthing of hands and objects.

No-Observed-Adverse-Effect-Level (NOAEL)— The highest exposure level at which there are no biologically significant increases in the frequency or severity of adverse effect between the exposed population and its appropriate control; some effects may be produced at this level, but they are not considered adverse or precursors of adverse effects.

Occupational mobility—An indicator of the frequency at which workers change from one occupation to another.

Occupational tenure—The cumulative number of years a person worked in his or her current occupation, regardless of number of employers, interruptions in employment, or time spent in other occupations.

Outdoor settled dust—Particles that have settled onto outdoor objects and surfaces due to either wet or dry deposition.

Oxygen consumption (VO_2)—The rate at which oxygen is used by tissues.

Parameter uncertainty—Uncertainty regarding some parameter.

Partially breast fed—Infants whose source of milk comes from both human milk and other milk substitutes.

Pathway—The physical course a chemical or pollutant takes from the source to the organism exposed.

Physiologically-based pharmacokinetic (PBPK) modeling—PBPK modeling is an approach for predicting the absorption, distribution, metabolism and excretion of a compound in humans.

Per capita intake rate—The average quantity of food consumed per person in a population composed of both individuals who ate the food during a specified time period and those that did not.

Pica—Pica behavior is the repeated eating of non-nutritive substances, whereas soil-pica is a form of soil ingestion that is characterized by the recurrent ingestion of unusually high amounts of soil (i.e., on the order of 1,000–5,000 milligrams per day or more).

Plain tap water—Excludes tap water consumed in the form of juices and other beverages containing tap water.

Population mobility—An indicator of the frequency at which individuals move from one residential location to another.

Population risk descriptor—An assessment of the extent of harm to the population being addressed. It can be either an estimate of the number of cases of a particular effect that might occur in a population (or population segment), or a description of what fraction of the population receives exposures, doses, or risks greater than a specified value.

Potential dose—The amount of a chemical contained in material ingested, air breathed, or bulk material applied to the skin.

Poverty/income ratio—Ratio of reported family income to federal poverty level.

Precision—A measure of the reproducibility of a measured value under a given set of circumstances.

Preparation losses—Net cooking losses, which include dripping and volatile losses, post cooking losses, which involve losses from cutting, bones, excess fat, scraps and juices, and other preparation losses which include losses from paring or coring.

Primary data/analysis— Information gathered from observations or measurements of a phenomena or the surveying of respondents.

Probabilistic uncertainty analysis—Technique that assigns a probability density function to each input parameter, then randomly selects values from each of the distributions and inserts them into the exposure equation. Repeated calculations produce a distribution of predicted values, reflecting the combined impact of variability in each input to the calculation. Monte Carlo is a common type of probabilistic Uncertainty analysis.

Protected products—Foods that have an outer protective coating that is typically removed before consumption.

Questionnaire/survey response—A "question and answer" data collection methodology conducted via in-person interview, mailed questionnaire, or questions administered in a test format in a school setting.

Random samples—Samples selected from a statistical population such that each sample has an equal probability of being selected.

Range—The difference between the largest and smallest values in a measurement data set.

Ready-to-feed—Infant and baby products (formula, juices, beverages, baby food), and table foods that do not need to have water added to them prior to feeding.

Real-time hand recording—Method by which trained observers manually record information on children's behavior.

Reasonable maximum exposure—A semiquantitative term referring to the lower portion of the high end of the exposure, dose, or risk distribution. As a semiquantitative term, it should refer to a range that can conceptually be described as above the 90^{th} percentile in the distribution, but below the 98^{th} percentile.

Recreational/sport fishermen—Individuals who catch fish as part of a sporting or recreational activity and not for the purpose of providing a primary source of food for themselves or for their families.

Reference Concentration (RfC)—An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive target groups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in U.S. EPA's noncancer health assessments. Durations include acute, short-term, subchronic, and chronic.

Reference Dose (RfD)—An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive target groups) that is likely to be without an appreciable risk of deleterious noncancer effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in U.S. EPA's noncancer health assessments. Durations include acute, short-term, subchronic, and chronic.

Relevant study—Studies that are applicable or pertinent, but not necessarily the most important to derive exposure factors. See also Key study.

Representativeness—The degree to which a sample is, or samples are, characteristic of the whole medium, exposure, or dose for which the samples are being used to make inferences.

Residential occupancy period—The time between a person moving into a residence and the time the person moves out or dies.

Residential volume—The volume (m^3) of the structure in which an individual resides and may be exposed to airborne contaminants.

Risk—The probability of an adverse effect in an organism, system, or population caused under specified circumstances by exposure to an agent.

Risk assessment—A process intended to calculate or estimate the risk to a given target organism, system, or population, including the identification of attendant uncertainties, following exposure to a particular agent, taking into account the inherent characteristics of the agent of concern as well as the characteristics of the specific target system. The risk assessment process includes four steps: hazard identification, hazard characterization (related term: Dose-response assessment), exposure assessment, and risk characterization. It is the first component in a risk analysis process.

Risk characterization—The qualitative and, wherever possible, quantitative determination, including attendant uncertainties, of the probability of occurrence of known and potential adverse effects of an agent in a given organism, system, or population, under defined exposure conditions. Risk characterization is the fourth step in the risk assessment process.

Risk communication—Interactive exchange of information about (health or environmental) risks among risk assessors, managers, news media, interested groups, and the general public.

Route—The way a chemical or pollutant enters an organism after contact, e.g., by ingestion, inhalation, or dermal absorption.

Sample—A small part of something designed to show the nature or quality of the whole. Exposure-related measurements are usually samples of environmental or ambient media, exposures of a small portion of a population for a short time, or biological samples, all for the purpose of inferring the nature and quality of parameters important to evaluating exposure.

Scenario uncertainty—Uncertainty regarding missing or incomplete information needed to fully define exposure and dose.

Screening-level assessment—An exposure assessment that examines exposures that would fall on or beyond the high end of the expected exposure distribution.

Secondary data/analysis—The reanalysis of data collected by other individuals or group; an analysis of data for purposes other than those for which the data were originally collected.

Sensitivity analysis—Process of changing one variable while leaving the others constant to determine its effect on the output. This procedure fixes each uncertain quantity at its credible lower and upper bounds (holding all others at their nominal values, such as medians) and computes the results of each combination of values. The results help to identify the variables that have the greatest effect on exposure estimates and help focus further information-gathering efforts.

Serving sizes—The quantities of individual foods consumed per eating occasion. These estimates may be useful for assessing acute exposures.

Short-term exposure—Repeated exposure for more than 24 hours, up to 30 days.

Slope Factor—An upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime exposure to an agent. This estimate, usually expressed in units of proportion (of a population) affected per mg/kg-day, is generally reserved for use in the low-dose region of the dose-response relationship, that is, for exposures corresponding to risks less than 1 in 100.

Soil—Particles of unconsolidated mineral and/or organic matter from the earth's surface that are located outdoors, or are used indoors to support plant growth.

Soil adherence—The quantity of soil that adheres to the skin and from which chemical contaminants are available for uptake at the skin surface.

Soil ingestion—The intentional or unintentional consumption of soil, resulting from various behaviors including, but not limited to, mouthing, contacting dirty hands, eating dropped food, or consuming soil directly. Soil-pica is a form of soil ingestion that is characterized by the recurrent ingestion of unusually high amounts of soil (i.e., on the order of 1,000–5,000 milligrams per day or more). Geophagy is also a form of soil ingestion defined as the intentional ingestion of earths and is usually associated with cultural practices.

Spatial variability—Variability across location, whether long- or short-term.

Subchronic exposure—Repeated exposure by the oral, dermal, or inhalation route for more than 30 days, up to approximately 10% of the life span in humans (more than 30 days up to approximately 90 days in typically used laboratory animal species).

Subsistence fishermen—Individuals who consume fresh caught fish as a major source of food.

Surface area—Coating, triangulation, and surface integration are direct measurement techniques that have been used to measure total body surface area and the surface area of specific body parts. Consideration has been given for differences due to age, gender, and race. Surface integration is performed by using a planimeter and adding the areas.

Surface integration—Method used to measure skin surface area in which a planimeter is used to measure areas of the skin, and the areas of various surfaces are summed.

Survey response methodology—Responses to survey questions are analyzed. This methodology includes questions asked of children directly, or their care givers, about behaviors affecting exposures.

Target—refers to any physical, biological, or ecological object exposed to an ***agent***.

Tap water from food manufacturing—Water used in industrial production of foods.

Temporal variability—Variability over time, whether long- or short-term.

Threshold—Dose or exposure concentration of an agent below which a stated effect is not observed or expected to occur.

Time-averaged exposure—The time-integrated exposure divided by the exposure duration. An example is the daily average exposure of an individual to carbon monoxide. (Also called timeweighted average exposure.)

Total dietary intake—The sum of all foods in the following food categories: dairy, meats, fish, eggs, grains, vegetables, fruits, and fats. It does not include beverages, sugar, candy, sweets, nuts and nut products.

Total tap water—Water consumed directly from the tap as a beverage or used in the preparation of foods and beverages (i.e., coffee, tea, frozen juices, soups, etc.).

Total fluid intake—Consumption of all types of fluids including tapwater, milk, soft drinks, alcoholic beverages, and water intrinsic to purchased foods.

Total water—Water from tap water and non tap water sources including water contained in food.

Toxicodynamics—The physiological mechanisms by which toxins are absorbed, distributed, metabolized and excreted

Toxicokinetics—The passage through the body of a toxic agent or its metabolites, usually in an action similar to that of pharmacokinetics.

Tracer-element studies—Soil ingestion studies that use trace elements found in soil and poorly metabolized in the human gut as indicators of soil intake.

Triangulation—Method used to measure skin surface area in which areas of the body are marked into geometric figures, then their linear dimensions are calculated.

Uncertainty—Uncertainty represents a lack of knowledge about factors affecting exposure or risk and can lead to inaccurate or biased estimates of exposure. The types of uncertainty include: scenario, parameter, and model.

Unit risk—The quantitative estimate in terms of either risk per µg/L drinking water (water unit risk) or risk per $\mu g/m^3$ air breathed (air unit risk).

Upper percentile—Values in the upper tail (i.e., between 90^{th} and 99.9^{th} percentile) of the distribution of values for a particular exposure factor. Values at the upper end of the distribution of values for a particular set of data.

Uptake—The process by which a substance crosses an absorption barrier and is absorbed into the body.

Usual dietary intakes— Refers to the long-term average daily intake by an individual.

Vapor intrusion—The migration of volatile chemicals from contaminated groundwater or soil into an overlying building.

Variability—Variability arises from true heterogeneity across people, places or time and can affect the precision of exposure estimates and the degree to which they can be generalized. The types of variability include: spatial, temporal, and inter-individual.

Ventilation Rate (VR)—Alternative term for inhalation rate or breathing rate. Usually measured as minute volume, i.e., volume (liters) of air exhaled per minute.

Video transcription—Method by which trained videographers tape a child's activities and subsequently extract data manually with computer software.

Wet-weight intake rates—Intake rates that are based on the wet (or whole) weight of the food consumed. This in contrast to dry-weight intake rates.

Worst case scenario—The maximum possible exposure, when everything that can plausibly happen to maximize exposure happens. The worst case represents a hypothetical individual and an extreme set of conditions that usually will not be observed in an actual population.

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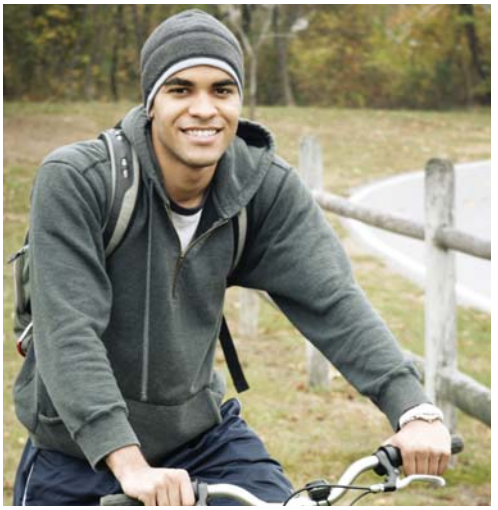

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