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9. INTAKE OF FRUITS AND VEGETABLES

9.1. BACKGROUND

Ingestion of contaminated fruits and vegetables is a potential pathway of human exposure to toxic chemicals. Fruits and vegetables may become contaminated with toxic chemicals by several different pathways. Ambient pollutants from the air 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 food contamination.

The primary source of information on consumption rates of fruits and vegetables among the United States population is the U.S. Department of Agriculture's (USDA) Nationwide Food Consumption Survey (NFCS) and the USDA Continuing Survey of Food Intakes by Individuals (CSFII). Data from the NFCS have been used in various studies to generate consumer-only and per capita intake rates for both individual fruits and vegetables and total fruits and total vegetables. CSFII data from the 1989-1991 survey have been analyzed by EPA to generate per capita intake rates for various food items and food groups.

Consumer-only intake is defined as the quantity of fruits and vegetables consumed by individuals who ate these food items during the survey period. Per capita intake rates are generated by averaging consumer-only intakes over the entire population of users and non-users. In general, per capita intake rates are appropriate for use in exposure assessment for which average dose estimates for the general population 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. Total fruit intake refers to the sum of all fruits consumed in a day including canned, dried, frozen, and fresh fruits. Likewise, total vegetable intake refers to the sum of all vegetables consumed in a day including canned, dried, frozen, and fresh vegetables. For the purposes of this handbook, the distinctions between fruits and vegetables are those commonly used, not the botanical definitions. For example, in this report, tomatoes are considered vegetables, although technically they are fruits.

Intake rates may be presented on either an as consumed or dry weight basis. As consumed intake rates (g/day) are based on the weight of the food in the form that it is consumed. In contrast, dry weight intake rates are based on the weight of the food consumed after the moisture content has been removed. In calculating exposures based on ingestion, the unit of weight used to measure intake should be consistent with those used in measuring the contaminant concentration in the produce. Intake data from the individual component of the NFCS and CSFII are based on "as eaten" (i.e., cooked or

prepared) forms of the food items/groups. Thus, corrections to account for changes in portion sizes from cooking losses are not required.

Estimating source-specific exposures to toxic chemicals in fruits and vegetables may also require information on the amount of fruits and vegetables that are exposed to or protected from contamination as a result of cultivation practices or the physical nature of the food product itself (i.e., those having protective coverings that are removed before eating would be considered protected), or the amount grown beneath the soil (i.e., most root crops such as potatoes). The percentages of foods grown above and below ground will be useful when the concentrations of contaminants in foods are estimated from concentrations in soil, water, and air. For example, vegetables grown below ground may be more likely to be contaminated by soil pollutants, but leafy above ground vegetables may be more likely to be contaminated by deposition of air pollutants on plant surfaces.

The purpose of this section is to provide: (1) intake data for individual fruits and vegetables, and total fruits and total vegetables; (2) guidance for converting between as consumed and dry weight intake rates; and (3) intake data for exposed and protected fruits and vegetables and those grown below ground. Recommendations are based on average and upper-percentile intake among the general population of the U.S. Available data have been classified as being either a key or a relevant study based on the considerations discussed in Volume I, Section 1.3.1 of the Introduction. Recommendations are based on data from the CSFII 1989-1991 survey, which was considered the only key intake study for fruits and vegetables. Other relevant studies are also presented to provide the reader with added perspective on this topic. It should be noted that many of the relevant studies are based on data from USDA's NFCS and CSFII. The USDA NFCS and CSFII are described below.

9.2. INTAKE STUDIES

9.2.1. U.S. Department of Agriculture Nationwide Food Consumption Survey and Continuing Survey of Food Intake by Individuals

USDA conducts the NFCS approximately every 10 years. The three most recent NFCSs were conducted in 1965-66, 1977-78, and 1987-88. The purpose of these surveys was to "analyze the food consumption behavior and dietary status of Americans" (USDA, 1992a). The survey uses a statistical sampling technique designed to ensure that all seasons, geographic regions of the U.S., and demographic and socioeconomic groups are represented. There are two components of the NFCS. The household component collects information on the socioeconomic and demographic characteristics of households, and the types, value, and sources of foods consumed over a 7-day period. The individual

component collects information on food intakes of individuals within each household over a 3-day period (USDA, 1992b).

The same basic survey design was used for the three most recent NFCSs, but the sample sizes and statistical classifications used were somewhat different (USDA, 1992a). In 1965-66, 10,000 households were surveyed (USDA, 1972). The sample size increased to 15,000 households (over 36,000 individuals) in 1977-78, but decreased to 4,500 households in 1987-88 because of budgetary constraints and a low response rate (37 percent). Data from the 1977-78 NFCS are presented in this handbook because the data have been published by USDA in various publications and reanalyzed by various EPA offices according to the food items/groups commonly used to assess exposure. Published 1-day data from the 1987-88 NFCS data are also presented.

USDA also conducts the Continuing Survey of Food Intake by Individuals. The purpose of the survey is to "assess food consumption behavior and nutritional content of diets for policy implications relating to food production and marketing, food safety, food assistance, and nutrition education" (USDA, 1995). An EPA analysis of the 1989-91 CSFII data set is presented in this handbook. During 1989 through 1991, over 15,000 individuals participated in the CSFII (USDA, 1995). Using a stratified sampling technique, individuals of all ages living in selected households in the 48 conterminous states and Washington, D.C. were surveyed. Individuals provided 3 consecutive days of data, including a personal interview on the first day followed by 2-day dietary records. The 3-day response rate for the 1989-91 CSFII was approximately 45 percent. Published 1-day data from the 1994 and 1995 CSFII are also presented. The 1994 and 1995 CSFII included data for 2 non-consecutive survey days (although 2 days of data have been collected, only data for the first survey day have been analyzed and published by USDA). Over 5,500 individuals participated in these surveys (USDA, 1996a; 1996b).

Individual average daily intake rates calculated from NFCS and CSFII data are based on averages of reported individual intakes over one day or three consecutive days. Such short term data are suitable for estimating mean average daily intake rates representative of both short-term and long-term consumption. However, the *distribution* of average daily intake rates generated using short term data (e.g., 3 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.

Day to day variation in intake among individuals will be great for food item/groups that are highly seasonal and for items/groups that are eaten year around but that are not typically eaten every day. For these foods, 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., vegetables) which are eaten on a daily basis throughout the year with minimal seasonality, the short term distribution may be a reasonable approximation of the true long term distribution, although it will show somewhat more variability. In this and the following section, distributions are shown only for the following broad categories of foods: fruits, vegetables, meats and dairy. Because of the increased variability of the short-term distribution, the short-term upper percentiles shown here will overestimate somewhat the corresponding percentiles of the long-term distribution.

9.2.2. Key Fruits and Vegetables Intake Study Based on the USDA CSFII

U.S. EPA Analysis of USDA 1989-91 CSFII Data - EPA analyzed three years of data from USDA's CSFII to generate distributions of intake rates for various fruit and vegetable items/groups. Data from the 1989, 1990, and 1991 CFSII were combined into a single data set to increase the number of observations available for analysis. Approximately 15,000 individuals provided intake data over the three survey years. The fruit and vegetable items/groups selected for this analysis included total fruits and total vegetables; individual fruits such as: apples, peaches, pears, strawberries, and other berries; individual vegetables such as: asparagus, beets, broccoli, cabbage, carrots, corn, cucumbers, lettuce, lima beans, okra, onions, peas, peppers, pumpkin, snap beans, tomatoes, and white potatoes; fruits and vegetables categorized as exposed, protected and roots; and various USDA categories (i.e., citrus and other fruits, and dark green, deep yellow, and other vegetables). These fruit and vegetable categories were selected to be consistent with those evaluated in the homegrown food analysis presented in Chapter 13. Intake rates of total vegetables, tomatoes, and white potatoes were adjusted to account for the amount of these food items eaten as meat and grain mixtures as described in Appendix 9A. Food items/groups were identified in the CSFII data base according to USDA-defined food codes. Appendix 9B presents the codes used to determine the various food groups. Intake rates for these food items/groups represent intake of all forms of the product (i.e., home produced and commercially produced).

Individual identifiers in the database were used throughout the analysis to categorize populations according to demographics. These identifiers included identification number, region, urbanization, age, sex, race, body weight, weighting factor, season, and number of days that data were reported. Distributions of intake were determined for individuals who provided data for all three days of the survey. Individuals who did not provide information on body weight, or for which identifying information was unavailable, were excluded from the analysis. Three-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 g/kg-day. The data were also weighted according to the three-day weights provided in the 1991 CSFII. USDA sample weights are calculated to account for inherent biases in the sample selection process, and to adjust the sample population to reflect the

national population. Summary statistics for individual intake rates were generated on a per capita basis. That is, both users and non-users of the food item were included in the analysis. Mean consumer only intake rates may be calculated by dividing the mean per capita intake rate by the percent of the population consuming the food item of interest. Summary statistics included are: number of weighted and unweighted observations, percentage of the population using the food item/group being analyzed, mean intake rate, standard error, and percentiles of the intake rate distribution (i.e., 0, 1, 5, 10, 25, 50, 75, 90, 95, 99, and 100th percentile). Data were provided for the total population using the food item being evaluated and for several demographic groups including: various age groups (i.e., <1, 1-2, 3-5, 6-11, 12-19, 20-39, 40-69, and 70+ years); regions (i.e., Midwest, Northeast, South, and West); urbanizations (i.e., Central City, Nonmetropolitan, and Suburban; seasons (i.e., winter, spring, summer, and fall); and races (i.e., White, Black, Asian, Native American, and other). Table 9-1 provides the codes, definitions, and a description of the data in these categories. The total numbers of individuals in the data set, by demographic group are presented in Table 9-2. The food analysis was accomplished using the SAS statistical programming system (SAS, 1990).

The results of this analysis are presented in Tables 9-3 and 9-4 for total fruits and total vegetables, Table 9-5 for individual fruits and vegetables, and Table 9-6 for the various USDA categories. The data for exposed/protected and root food items are presented in Tables 9-7 through 9-11. These tables are presented at the end of this Chapter. 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. However, if there is a need to compare the intake data presented here to intake data in units of g/day, a body weight less than 70 kg (i.e., approximately 60 kg; calculated based on the number of respondents in each age category and the average body weights for these age groups, as presented in Chapter 7 of Volume I) should be used because the total survey population included children as well as adults.

The advantages of using the 1989-91 CSFII data set are that the data are expected to be generally representative of the U.S. population and that it includes data on a wide variety of food types. However, it should be noted that the survey covers only the 48 coterminous U.S. States; Hawaii, Alaska, and U.S. Territories are not included. The data set was the most recent of a series of publicly available USDA data sets (i.e., NFCS 1977-78; NFCS 1987-88; CSFII 1989-91) at the time that EPA conducted the analysis for this handbook, and should reflect recent eating patterns in the United States. The data set includes three years of intake data combined. However, the 1989-91 CSFII data are based on a three day survey period. Short-term dietary data may not accurately reflect long-term eating patterns. This is particularly true for the tails (extremes) of the distribution

of food intake. In addition, the adjustment for including mixtures adds uncertainty to the intake rate distributions. The calculation for including mixtures assumes that intake of any mixture includes all of the foods identified in Appendix Table 9A-1 in the proportions specified in that table. This may under- or over-estimate intake of certain foods among some individuals.

The data presented in this handbook for the USDA 1989-91 CSFII is not the most up-to-date information on food intake. USDA has recently made available the data from its 1994 and 1995 CSFII. Over 5,500 people nationwide participated in both of these surveys, providing recalled food intake information for 2 separate days. Although the 2-day data analysis has not been conducted, USDA published the results for the respondents' intakes on the first day surveyed (USDA, 1996a; 1996b). USDA 1996 survey data will be made available later in 1997. As soon as 1996 data are available, EPA will take steps to get the 3-year data (1994, 1995, and 1996) analyzed and the food ingestion factors updated. Meanwhile, Table 9-12 presents a comparison of the mean daily intakes per individual in a day for fruits and vegetables from the USDA survey data from years 1977-78, 19887-88, 1989-91, 1994, and 1995. This table shows that food consumption patterns have changed for fruits when comparing 1977 and 1995 data. Consumption of fruits increased by 72 percent, but vegetable intake remained relatively constant, when comparing data from 1977 and 1995. However, only an 11 percent increase was observed when comparing fruit intake values from 1989-91 with the most recent data from 1994 and 1995. This indicates that the 1989-91 CSFII data are probably adequate for assessing ingestion exposure for current populations.

9.2.3. Relevant Fruits and Vegetables Intake Studies

The U.S. EPA's Dietary Risk Evaluation System (DRES) - USEPA, Office of Pesticide Programs - The U.S. EPA, Office of Pesticide Programs (OPP) uses the Dietary Risk Evaluation System (formerly the Tolerance Assessment System) to assess the dietary risk of pesticide use as part of the pesticide registration process. OPP sets tolerances for specific pesticides on raw agricultural commodities based on estimates of dietary risk. These estimates are calculated using pesticide residue data for the food item of concern and relevant consumption data. Intake rates are based primarily on the USDA 1977-78 NFCS although intake rates for some food items are based on estimations from production volumes or other data (i.e., some items were assigned an arbitrary value of 0.000001 g/kg-day) (Kariya, 1992). OPP has calculated per capita intake rates of individual fruits and vegetables for 22 subgroups (age, regional, and seasonal) of the population by determining the composition of NFCS food items and disaggregating complex food dishes into their component raw agricultural commodities (RACs) (White et al., 1983).

The DRES per capita, as consumed intake rates for all age/sex/demographic groups combined are presented in Table 9-13. These data are based on both consumers and non

consumers of these food items. Data for specific subgroups of the population are not presented here, but are available through OPP via direct request. The data in Table 9-13 may be useful for estimating the risks of exposure associated with the consumption of individual fruits and vegetables. It should be noted that these data are indexed to the reported body weights of the survey respondents and are expressed in units of grams of food consumed per kg bodyweight per day. Consequently, use of these data in calculating potential dose does not require the body weight factor in the denominator of the ADD equation. It should also be noted that conversion of these intake rates into units of g/day by multiplying by a single average body weight is not appropriate because the DRES data base did not rely on a single body weight for all individuals. Instead, DRES used the body weights reported by each individual surveyed to estimate consumption in units of g/kg-day.

The advantages of using these data are that complex food dishes have been disaggregated to provide intake rates for a very large number of fruits and vegetables. These data are also based on the individual body weights of the respondents. Therefore, the use of these data in calculating exposure to toxic chemicals may provide more representative estimates of potential dose per unit body weight. However, because the data are based on NFCS short-term dietary recall the same limitations discussed previously for other NFCS data sets also apply here. In addition, consumption patterns may have changed since the data were collected in 1977-78. OPP is in the process of translating consumption information from the USDA CSFII 1989-91 survey to be used in DRES.

Food and Nutrient Intakes of Individuals in One Day in the U.S., USDA (1980, 1992b, 1996a, 1996b) - USDA calculated mean intake rates for total fruits and total vegetables using NFCS data from 1977-78 and 1987-88 (USDA, 1980; USDA, 1992b) and CSFII data from 1994 and 1995 (USDA, 1996a; 1996b). The mean per capita total intake rates are presented in Tables 9-14 and 9-15 for fruits and Tables 9-16 and 9-17 for vegetables. These values are based on intake data for one day from the 1977-78 and 1987-88 USDA NFCSs, respectively. Data from both surveys are presented here to demonstrate that although the 1987-88 survey had fewer respondents, the mean per capita intake rates for all individuals are in good agreement with the earlier survey. Also, slightly different age classifications were used in the two surveys providing a wider range of age categories from which exposure assessors may select appropriate intake rates. Tables 9-18 and 9-19 present similar data from the 1994 and 1995 CSFII. The age groups used in this data set are the same as those used in the 1987-88 NFCS. Tables 9-14 through 9-19 include both per capita intake rates and intake rates for consumers-only for various ages of individuals. Intake rates for consumers-only were calculated by dividing the per capita consumption rate by the fraction of the population using vegetables or fruits in a day. The average per capita vegetable intake rate is 201 g/day based on the 1977-78 data (USDA, 1980), 182 g/day based on the 1987-88 data (USDA, 1992b), 186 g/day based on the 1994 data, and 188 g/day based on the 1995 data. For fruits the average per capita intake rate is 142

g/day based on the two most recent USDA NFCSs (USDA, 1980; USDA, 1992b), and 171 g/day and 173 g/day based on the 1994 and 1995 CSFII, respectively (USDA, 1996a, 1996b). One-day per capita intake data for fats or oils from the 1994 and 1995 CSFII surveys are presented in Table 9-20. This total fats and oils food category includes table and cooking fats, vegetable oils, salad dressings, nondairy cream substitutes, and sauces such as tartar sauce that are mainly fat or oil (USDA, 1996a). It does not include oils or fats that were ingredients in food mixtures.

The advantages of using these data are that they provide intake estimates for all fruits, all vegetables, or all fats combined. Again, these estimates are based on one-day dietary data which may not reflect usual consumption patterns.

U.S. EPA - Office of Radiation Programs - The U.S. EPA Office of Radiation Programs (ORP) has also used the USDA 1977-78 NFCS to estimate daily food intake (U.S. EPA, 1984a; 1984b). ORP uses food consumption data to assess human intake of radionuclides in foods. The 1977-78 NFCS data have been reorganized by ORP, and food items have been classified according to the characteristics of radionuclide transport. Data for selected agricultural products are presented in Table 9-21 and Table 9-22. These data represent per capita, as consumed intake rates for total, leafy, exposed, and protected produce. Exposed produce refers to products (e.g., apples, pears, berries, etc.) that can intercept atmospherically deposited materials. The term protected refers to products (e.g., citrus fruit, carrots, corn, etc.) that are protected from deposition from the atmosphere. Although the fruit and vegetable classifications used in the study are somewhat limited in number, they provide alternative food categories that may be useful to exposure assessors. Because this study was based on the USDA NFCS, the limitations discussed previously regarding short-term dietary recall data also apply to the intake rates reported here. Also, consumption patterns may have changed since the data were collected in 1977-78.

U.S. EPA - Office of Science and Technology - The U.S. EPA Office of Science and Technology (OST) within the Office of Water (formerly the Office of Water Regulations and Standards) used data from the FDA revision of the Total Diet Study Food Lists and Diets (Pennington, 1983) to calculate food intake rates (U.S. EPA, 1989). OST uses these consumption data in its risk assessment model for land application of municipal sludge. The FDA data used are based on the combined results of the USDA 1977-78, NFCS and the second National Health and Nutrition Examination Survey (NHANES II), 1976-80 (U.S. EPA, 1989). Because food items are listed as prepared complex foods in the FDA Total Diet Study, each item was broken down into its component parts so that the amount of raw commodities consumed could be determined. Table 9-23 presents intake rates of various fruit and vegetable categories for various age groups and estimated lifetime ingestion rates that have been derived by U.S. EPA. Note that these are per capita intake rates tabulated as grams dry weight/day. Therefore, these rates differ from those in the

previous tables because U.S. EPA (1984a, 1984b) report intake rates on an as consumed basis.

The EPA-OST analysis provides intake rates for additional food categories and estimates of lifetime average daily intake on a per capita basis. In contrast to the other analyses of USDA NFCS data, this study reports the data in terms of dry weight intake rates. Thus, conversion is not required when contaminants are to be estimated on a dry weight basis. These data, however, may not reflect current consumption patterns because they are based on data from 1977-78.

Canadian Department of National Health and Welfare Nutrition Canada Survey - The Nutrition Canada Survey was conducted between 1970 and 1972 to "(a) examine the mean consumption of selected food groups and their contribution to nutrient intakes of Canadians, (b) examine patterns of food consumption and nutrient intake at various times of the day, and provide information on the changes in eating habits during pregnancy." (Canadian Department of National Health and Welfare, n.d.). The method used for collecting dietary intake data was 24-hour recall. The recall method relied on interview techniques in which the interviewee was asked to recall all foods and beverages consumed during the day preceding the interview. Intake rates were reported for various age/sex groups of the population and for pregnant women (Table 9-24). The report does not specify whether the values represent per capita or consumer-only intake rates. However, they appear to be consistent with the as consumed intake rates for consumers-only reported by USDA (1980, 1992b). It should be noted that these data are also based on short-term dietary recall and are based on the Canadian population.

USDA (1993) - Food Consumption, Prices, and Expenditures, 1970-92 - The USDA's Economic Research Service (ERS) calculates the amount of food available for human consumption in the United States on an annual basis (USDA, 1993). Supply and utilization balance sheets are generated, based on the flow of food items from production to end uses for the years 1970 to 1992. Total available supply is estimated as the sum of production and imports (USDA, 1993). The availability of food for human use commonly termed as "food disappearance" is determined by subtracting exported foods from the total available supply (USDA, 1993). USDA (1993) calculates the per capita food consumption by dividing the total food disappearance by the total U.S. population. USDA (1993) estimated per capita consumption data for various fruit and vegetable products from 1970-1992 (1992 data are published). In this section, the 1991 values, which are the most recent published final data, are presented. Retail weight per capita data are presented in Table 9-25. These data have been derived from the annual per capita values in units of pounds per year, presented by USDA (1993), by converting to units of g/day.

One of the limitations of this study is that disappearance data do not account for losses from the food supply from waste or spoilage. As a result, intake rates based on

these data may overestimate daily consumption because they are based on the total quantity of marketable commodity utilized. Thus, these data represent bounding estimates of intake rates only. 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, 1993). An advantage of this study is that it provides per capita consumption rates for fruits and vegetables that are representative of long-term intake because disappearance data are generated annually.

AIHC, 1994 - Exposure Factors Sourcebook - The AIHC Sourcebook (AIHC, 1994) uses the data presented in the 1989 version of the Exposure Factors Handbook which reported data from the USDA 1977-78 NFCS. Distributions are provided in the @Risk format and the @Risk formula is also provided. In this handbook, new analyses of more recent data from the USDA 1989-91 CSFII are presented. Numbers, however, cannot be directly compared with previous values since the results from the new analysis are presented on a body weight basis.

The Sourcebook was classified as a relevant study because it was not the primary source for the data to make recommendations in this document. However, it can be used as an alternative source of information.

The advantage of using the CSFII and USDA NFCS data sets are that they are the largest publicly available data source on food intake patterns in the United States. Data are available for a wide variety of fruit and vegetable products and are intended to be representative of the U.S. population.

9.2.4. Relevant Fruits and Vegetables Serving Size Study Based on the USDA NFCS

Pao et al. (1982) - Foods Commonly Eaten by Individuals - Using data gathered in the 1977-78 USDA NFCS, Pao et al. (1982) calculated distributions for the quantities of individual fruit and vegetables consumed per eating occasion by members of the U.S. population (i.e., serving sizes), over a 3-day period. The data were collected during NFCS home interviews of 37,874 respondents, who were asked to recall food intake for the day preceding the interview, and record food intake the day of the interview and the day after the interview.

Serving size data are presented on an as consumed (g/day) basis. The data presented in Table 9-26 are for all ages of the population, combined. If age-specific intake data are needed, refer to Pao et al. (1982). Although serving size data only are presented in this handbook, percentiles for the average quantities of individual fruits and vegetables

consumed by members of the U.S. population who had consumed these fruits and vegetables over a 3-day period can be found in Pao et al. (1982).

The advantages of using these data are that they were derived from the USDA NFCS and are representative of the U.S. population. This data set provides serving size distributions for a number of commonly eaten fruits and vegetables, but the list of foods is limited and does not account for fruits and vegetables included in complex food dishes. Also, these data represent the quantity of fruits and vegetables consumed per eating occasion. Although these estimates are based on USDA NFCS 1977-78 data, serving size data have been collected but not published for the more recent USDA surveys. 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. However, it should be noted that serving sizes may have changed since the data were collected in 1977-78.

9.2.5. Conversion Between As Consumed and Dry Weight Intake Rates

As noted previously, intake rates may be reported in terms of units as consumed or units of dry weight. 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 unit of food consumption is grams dry weight/day, then the unit for the amount of pollutant in the food should be grams dry weight).

If necessary, as consumed intake rates may be converted to dry weight intake rates using the moisture content percentages presented in Table 9-27 and the following equation:

$$IR_{dw} = IR_{ac} * [(100-W)/100] \qquad \text{(Eqn. 9-1)}$$

"Dry weight" intake rates may be converted to "as consumed" rates by using:

$$IR_{ac} = IR_{dw}/[(100-W)/100] \qquad \text{(Eqn. 9-2)}$$

where:

IR_{dw} = dry weight intake rate;
IR_{ac} = as consumed intake rate; and
W = percent water content.

9.3. RECOMMENDATIONS

The 1989-91 CSFII data described in this section were used in selecting recommended fruit and vegetable intake rates for the general population and various subgroups of the United States population. The general design of both key and relevant studies are summarized in Table 9-28. Table 9-29 presents a summary of the recommended values for fruit and vegetable intake and Table 9-30 presents the confidence ratings for the fruit and vegetable intake recommendations. Based on the CSFII 1989-91, the recommended per capita fruit intake rate for the general population is 3.4 g/kg-day and the recommended per capita vegetable intake rate for the general population is 4.3 g/kg-day. Per capita intake rates for specific food items, on a g/kg-day basis, may be obtained from Table 9-5. Percentiles of the per capita intake rate distribution in the general population for total fruits and total vegetables are presented in Tables 9-3 and 9-4. From these tables, the 95th percentile intake rates for fruits and vegetables are 12 g/kg-day and 10 g/kg-day, respectively. It is important to note that the distributions presented in Tables 9-3 through 9-4 are based on data collected over a 3-day period and may not necessarily reflect the long-term distribution of average daily intake rates. However, for these broad categories of food (i.e., total fruits and total vegetables), because they 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. Intake rates for the home-produced form of these fruit and vegetable products are presented in Volume II, Chapter 13. It should be noted that because these recommendations are based on 1989-91 CSFII data, they may not reflect the most recent changes that may have occurred in consumption patterns. However, as indicated in Table 9-12, intake has remained fairly constant between 1989-91 and 1995. Thus, the 1989-91 CSFII data are believed to be appropriate for assessing ingestion exposure for current populations.

APPENDIX 9A

CALCULATIONS USED IN THE 1989-91 CSFII ANALYSIS TO CORRECT FOR MIXTURES

APPENDIX 9A
Calculations Used in the 1989-91 CSFII Analysis to Correct for Mixtures

Distributions of intake for various food groups were generated for the food/items groups using the USDA 1989-91 CSFII data set as described in Sections 9.2.2. and 11.1.2. However, several of the food categories used did not include meats, dairy products, and vegetables that were eaten as mixtures with other foods. Thus, adjusted intake rates were calculated for food items that were identified by USDA (1995) as comprising a significant portion of grain and meat mixtures. To account for the amount of these foods consumed as mixtures, the mean fractions of total meat or grain mixtures represented by these food items were calculated (Table 9A-1) using Appendix C of USDA (1995). Mean values for all individuals were used to calculate these fractions. These fractions were multiplied by each individual's intake rate for total meat mixtures or grain mixtures to calculate the amount of the individual's food mixture intake that can be categorized into one of the selected food groups. These amounts were then added to the total intakes rates for meats, grains, total vegetables, tomatoes, and white potatoes to calculate an individual's total intake of these food groups, as shown in the example for meats below.

$$IR_{meat\&adjusted} \;'\; (IR_{gr\ mixtures} \;(\; Fr_{meat/gr}) \;\%\; (IR_{mt\ mixtures} \;(\; Fr_{meat/mt}) \;\%\; (IR_{meat})$$

where:

$IR_{meat\text{-}adjusted}$	=	adjusted individual intake rate for total meat;
$IR_{gr\ mixtures}$	=	individual intake rate for grain mixtures;
$IR_{mt\ mixtures}$	=	individual intake rate for meat mixtures;
IR_{meat}	=	individual intake rate for meats;
$Fr_{meat/gr}$	=	fraction of grain mixture that is meat; and
$Fr_{meat/mt}$	=	fraction of meat mixture that is meat.

Population distributions for mixture-adjusted intakes were based on adjusted intake rates for the population of interest.

Table 9-1. Sub-category Codes and Definitions Used in the CSFII 1989-91 Analysis

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	Nonmetropolitan	An area that is not within an MSA.
		Season
Spring	-	April, May, June
Summer	-	July, August, September
Fall	-	October, November, December
Winter	-	January, February, March
		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

[a] Alaska and Hawaii were not included.
Source: CSFII 1989-91.

Table 9-2. Weighted and Unweighted Number of Observations for 1989-91 CSFII Data Used in Analysis of Food Intake

Demographic Factor	Weighted	Unweighted
Total	242,707,000	11,912
Age		
<01	7,394,000	424
01-02	7,827,000	450
03-05	11,795,000	603
06-11	21,830,000	1,147
12-19	26,046,000	1,250
20-39	78,680,000	3,555
40-69	71,899,000	3,380
70+	17,236,000	1,103
Season		
Fall	60,633,000	3,117
Spring	60,689,000	3,077
Summer	60,683,000	2,856
Winter	60,702,000	2,862
Urbanization		
Central City	73,410,000	3,607
Nonmetropolitan	53,993,000	3,119
Suburban	115,304,000	5,186
Race		
Asian	2,871,000	149
Black	29,721,000	1,632
Native American	2,102,000	171
Other/NA	7,556,000	350
White	200,457,000	9,610
Region		
Northeast	59,285,000	3,007
Midwest	50,099,000	2,180
South	83,741,000	4,203
West	49,582,000	2,522

Table 9-3. Per Capita Intake of Total Fruits (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	69.0%	3.381	0.068	0	0	0	0	1.68	4.16	7.98	12.44	26.54	210.72
Age (years)													
< 01	67.9%	14.898	1.285	0	0	0	0	8.80	21.90	35.98	42.77	88.42	210.72
01-02	76.7%	11.836	0.582	0	0	0	2.80	9.76	17.99	25.70	30.69	52.27	80.19
03-05	80.8%	8.422	0.364	0	0	0	2.22	6.37	12.53	19.29	22.78	32.83	52.87
06-11	79.2%	5.047	0.160	0	0	0	1.30	3.86	7.17	11.79	14.49	21.53	30.37
12-19	62.6%	2.183	0.095	0	0	0	0	1.36	3.38	5.66	7.24	11.80	16.86
20-39	58.8%	1.875	0.056	0	0	0	0	1.06	2.82	5.08	6.43	10.26	41.58
40-69	71.0%	2.119	0.051	0	0	0	0	1.36	3.24	5.20	6.73	10.52	23.07
70 +	83.3%	2.982	0.087	0	0	0	0.89	2.42	4.28	6.77	8.31	11.89	15.00
Season													
Fall	68.9%	3.579	0.169	0	0	0	0	1.66	3.94	8.20	13.41	32.62	204.28
Spring	68.3%	3.249	0.116	0	0	0	0	1.73	4.14	7.43	12.22	23.71	88.42
Summer	70.4%	3.381	0.131	0	0	0	0	1.80	4.29	7.87	12.26	23.11	210.72
Winter	68.4%	3.314	0.119	0	0	0	0	1.52	4.27	8.33	12.17	26.54	75.52
Urbanization													
Central City	68.8%	3.288	0.114	0	0	0	0	1.66	4.00	7.82	11.94	23.73	210.72
Nonmetropolitan	67.4%	3.107	0.113	0	0	0	0	1.51	3.94	7.52	12.25	26.04	84.34
Suburban	70.1%	3.567	0.113	0	0	0	0	1.80	4.40	8.43	13.19	28.13	204.28
Race													
Asian	77.2%	5.839	0.632	0	0	0	1.24	4.20	6.76	17.30	20.65	29.61	38.95
Black	63.7%	3.279	0.188	0	0	0	0	1.51	4.25	7.70	12.34	26.54	210.72
Native American	61.4%	3.319	0.490	0	0	0	0	1.58	4.31	7.57	16.02	22.66	29.24
Other/NA	64.9%	4.027	0.465	0	0	0	0	1.77	5.10	10.92	14.96	47.78	53.89
White	70.1%	3.337	0.075	0	0	0	0	1.66	4.06	7.87	12.21	26.48	204.28
Region													
Midwest	69.9%	3.236	0.120	0	0	0	0	1.58	4.07	7.87	11.30	28.64	84.34
Northeast	73.9%	3.665	0.143	0	0	0	0.07	1.84	4.70	8.37	12.75	31.67	88.42
South	62.0%	3.017	0.105	0	0	0	0	1.42	3.80	7.39	11.67	24.67	210.72
West	75.4%	3.880	0.187	0	0	0	0.17	2.08	4.45	9.18	14.61	25.49	204.28

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-4. Per Capita Intake of Total Vegetables (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	97.2%	4.259	0.029	0	0.75	1.29	2.26	3.60	5.37	7.93	10.00	15.65	44.99
Age (years)													
< 01	74.8%	6.802	0.375	0	0	0	0	5.52	10.41	15.27	19.29	29.61	44.99
01-02	95.6%	7.952	0.228	0	1.33	2.32	4.65	7.28	10.26	14.77	16.32	21.24	32.10
03-05	97.2%	7.125	0.200	0	1.11	2.15	3.79	5.83	9.64	13.87	15.43	25.09	35.56
06-11	97.6%	5.549	0.109	0	1.03	1.72	3.09	4.82	7.31	10.06	11.74	18.39	31.30
12-19	98.1%	3.807	0.070	0	0.85	1.30	2.16	3.49	4.71	6.80	8.52	12.26	27.84
20-39	98.2%	3.529	0.037	0	0.75	1.22	2.06	3.16	4.54	6.36	7.63	10.69	17.07
40-69	98.3%	3.741	0.039	0	0.85	1.34	2.19	3.43	4.94	6.56	7.78	10.91	24.51
70 +	98.3%	4.068	0.071	0	0.96	1.47	2.47	3.67	5.35	6.89	8.17	11.96	18.92
Season													
Fall	97.8%	4.366	0.063	0	0.86	1.31	2.28	3.56	5.28	8.33	10.52	17.95	35.56
Spring	96.9%	4.095	0.055	0	0.72	1.20	2.19	3.45	5.19	7.67	9.85	15.33	44.99
Summer	97.0%	4.181	0.059	0	0.58	1.16	2.21	3.54	5.34	7.73	9.54	15.14	41.68
Winter	97.0%	4.394	0.056	0	0.86	1.40	2.36	3.78	5.67	8.03	9.69	15.23	29.69
Urbanization													
Central City	97.4%	4.059	0.053	0	0.67	1.22	2.08	3.34	5.17	7.74	9.51	16.04	44.99
Nonmetropolitan	96.3%	4.450	0.060	0	0.86	1.41	2.44	3.72	5.66	8.28	10.08	16.27	35.56
Suburban	97.6%	4.296	0.044	0	0.82	1.31	2.30	3.64	5.38	7.86	10.17	15.39	41.68
Race													
Asian	93.3%	4.913	0.330	0	0	1.53	2.06	3.66	7.52	10.32	14.84	15.43	16.76
Black	96.1%	4.228	0.093	0	0.36	0.85	1.99	3.19	5.46	8.80	11.35	18.39	32.10
Native American	87.1%	4.880	0.277	0	0	0.58	2.40	4.22	6.85	8.87	11.37	13.89	21.77
Other/NA	96.6%	4.762	0.183	0	0	1.11	2.46	4.24	6.20	9.33	11.93	15.02	22.14
White	97.6%	4.229	0.031	0	0.86	1.37	2.30	3.60	5.32	7.74	9.75	15.31	44.99
Region													
Midwest	97.0%	4.123	0.061	0	0.75	1.20	2.09	3.35	5.16	8.03	9.87	16.90	35.56
Northeast	97.2%	4.494	0.073	0	0.69	1.29	2.37	3.77	5.70	8.42	11.00	15.86	41.68
South	97.4%	4.268	0.047	0	0.86	1.39	2.31	3.66	5.32	7.76	9.80	15.31	44.99
West	96.9%	4.168	0.060	0	0.60	1.22	2.25	3.57	5.38	7.78	9.53	15.28	35.56

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-5. Per Capita Intake of Individual Fruits and Vegetables (g/kg-day as consumed)

Population Group	Apples			Asparagus			Bananas			Beets		
	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
Total	28.4%	0.854	0.052	1.5%	0.012	0.008	20.9%	0.27	0.02	1.8%	0.009	0.010
Age (years)												
< 01	41.7%	5.042	0.823	0.0%	0	0	24.3%	1.33	0.27	1.2%	0.045	0.296
01-02	42.9%	4.085	0.508	0.2%	0.003	0.041	23.3%	0.86	0.17	0.7%	0.006	0.055
03-05	44.1%	3.004	0.312	0.2%	0.001	0.038	20.1%	0.46	0.09	0.5%	0.006	0.056
06-11	41.6%	1.501	0.123	0.3%	0.001	0.019	16.2%	0.29	0.05	0.9%	0.008	0.040
12-19	23.0%	0.394	0.062	0.3%	0.003	0.033	13.3%	0.16	0.03	0.6%	0.001	0.010
20-39	21.3%	0.337	0.033	1.1%	0.008	0.012	14.4%	0.13	0.02	1.3%	0.004	0.007
40-69	26.0%	0.356	0.027	2.5%	0.025	0.016	26.0%	0.22	0.02	2.4%	0.009	0.009
70 +	30.8%	0.435	0.052	3.5%	0.026	0.028	37.4%	0.36	0.03	5.2%	0.029	0.022
Season												
Fall	33.7%	1.094	0.116	0.8%	0.005	0.013	19.3%	0.25	0.03	1.2%	0.009	0.040
Spring	25.9%	0.667	0.078	2.7%	0.023	0.017	21.3%	0.27	0.03	2.0%	0.009	0.012
Summer	23.2%	0.751	0.122	1.1%	0.006	0.014	20.5%	0.23	0.03	1.7%	0.005	0.008
Winter	30.4%	0.905	0.095	1.3%	0.015	0.018	22.6%	0.31	0.03	2.3%	0.011	0.013
Urbanization												
Central City	27.4%	0.749	0.081	1.1%	0.013	0.018	19.6%	0.25	0.03	1.3%	0.008	0.031
Nonmetropolitan	26.8%	0.759	0.104	1.3%	0.011	0.015	20.5%	0.24	0.03	1.8%	0.010	0.013
Suburban	29.9%	0.965	0.083	1.8%	0.013	0.012	21.9%	0.29	0.03	2.0%	0.008	0.009
Race												
Asian	38.3%	0.871	0.327	2.7%	0.067	0.123	33.6%	0.54	0.20	0.7%	0.040	0.320
Black	22.7%	0.688	0.159	0.3%	0.003	0.019	14.4%	0.19	0.04	1.1%	0.007	0.024
Native American	20.5%	0.407	0.273	0.0%	0	0	17.5%	0.36	0.16	1.2%	0.003	0.028
Other/NA	24.9%	0.964	0.256	0.6%	0.001	0.009	20.6%	0.33	0.15	0.9%	0.015	0.101
White	29.4%	0.879	0.057	1.7%	0.013	0.009	21.8%	0.27	0.02	1.9%	0.008	0.010
Region												
Midwest	29.1%	0.782	0.082	1.8%	0.015	0.016	18.8%	0.25	0.03	0.8%	0.010	0.049
Northeast	31.5%	0.953	0.116	1.6%	0.015	0.022	23.0%	0.26	0.04	2.3%	0.008	0.012
South	23.6%	0.828	0.099	1.0%	0.010	0.014	19.3%	0.28	0.03	1.8%	0.009	0.011
West	32.7%	0.885	0.121	1.8%	0.012	0.015	24.0%	0.27	0.03	2.4%	0.008	0.009

Table 9-5. Per Capita Intake of Individual Fruits and Vegetables (g/kg-day as consumed) (continued)

Population Group	Broccoli Percent Consuming	Broccoli Mean	Broccoli SE	Cabbage Percent Consuming	Cabbage Mean	Cabbage SE	Carrots Percent Consuming	Carrots Mean	Carrots SE	Corn Percent Consuming	Corn Mean	Corn SE
Total	10.9%	0.107	0.012	12.2%	0.088	0.009	16.9%	0.115	0.010	24.1%	0.206	0.010
Age (years)												
< 01	4.2%	0.142	0.224	2.4%	0.023	0.078	13.4%	0.379	0.165	17.5%	0.356	0.128
01-02	7.6%	0.234	0.134	5.1%	0.086	0.089	13.3%	0.214	0.085	32.9%	0.587	0.091
03-05	10.1%	0.307	0.118	7.5%	0.107	0.081	15.1%	0.148	0.052	31.5%	0.490	0.070
06-11	6.8%	0.098	0.052	7.5%	0.049	0.027	17.1%	0.154	0.037	35.8%	0.367	0.032
12-19	8.2%	0.065	0.028	8.5%	0.065	0.028	11.8%	0.056	0.018	24.0%	0.173	0.024
20-39	11.4%	0.081	0.015	10.6%	0.070	0.015	15.2%	0.076	0.013	23.8%	0.154	0.013
40-69	13.8%	0.102	0.016	17.1%	0.115	0.015	20.1%	0.120	0.016	20.4%	0.138	0.013
70 +	11.8%	0.115	0.028	21.1%	0.151	0.025	21.3%	0.132	0.022	19.0%	0.140	0.027
Season												
Fall	10.8%	0.089	0.024	12.3%	0.092	0.019	17.7%	0.100	0.017	23.6%	0.171	0.018
Spring	11.7%	0.122	0.022	12.4%	0.086	0.018	16.5%	0.117	0.022	24.7%	0.204	0.019
Summer	8.8%	0.120	0.032	12.3%	0.097	0.018	13.9%	0.083	0.017	24.8%	0.244	0.022
Winter	12.3%	0.098	0.020	11.9%	0.076	0.014	19.2%	0.160	0.022	23.2%	0.205	0.020
Urbanization												
Central City	10.6%	0.119	0.024	10.8%	0.073	0.015	15.5%	0.111	0.019	22.4%	0.182	0.017
Nonmetropolitan	9.0%	0.067	0.017	13.7%	0.102	0.016	14.4%	0.095	0.017	27.6%	0.255	0.020
Suburban	12.2%	0.119	0.019	12.4%	0.091	0.014	19.2%	0.127	0.015	23.1%	0.198	0.015
Race												
Asian	15.4%	0.209	0.166	27.5%	0.400	0.100	28.2%	0.177	0.101	14.1%	0.134	0.080
Black	8.3%	0.154	0.047	13.9%	0.129	0.029	7.0%	0.066	0.036	24.6%	0.226	0.028
Native American	5.3%	0.021	0.045	4.7%	0.037	0.068	11.1%	0.097	0.075	30.4%	0.373	0.099
Other/NA	10.3%	0.180	0.100	6.0%	0.041	0.044	12.9%	0.104	0.063	16.9%	0.160	0.065
White	11.4%	0.097	0.012	12.1%	0.080	0.009	18.6%	0.122	0.011	24.3%	0.204	0.011
Region												
Midwest	8.4%	0.077	0.025	10.1%	0.065	0.016	16.2%	0.100	0.018	26.8%	0.242	0.020
Northeast	13.5%	0.113	0.026	11.6%	0.083	0.022	19.0%	0.151	0.027	23.3%	0.208	0.026
South	9.8%	0.109	0.022	14.4%	0.106	0.015	12.4%	0.074	0.015	24.9%	0.219	0.016
West	13.4%	0.135	0.025	11.8%	0.088	0.016	23.3%	0.166	0.021	20.1%	0.138	0.018

Table 9-5. Per Capita Intake of Individual Fruits and Vegetables (g/kg-day as consumed) (continued)

Population Group	Cucumbers			Lettuce			Lima Beans			Okra		
	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
Total	15.8%	0.063	0.006	41.3%	0.224	0.006	0.9%	0.006	0.007	1.3%	0.009	0.007
Age (years)												
< 01	2.4%	0.021	0.107	6.8%	0.025	0.026	0.5%	0.005	0.055	0.5%	0.003	0.040
01-02	7.3%	0.062	0.069	18.2%	0.116	0.039	0.4%	0.006	0.069	0.2%	0.004	0.068
03-05	12.1%	0.083	0.046	29.4%	0.191	0.031	0.0%	0	0	0.7%	0.013	0.046
06-11	14.9%	0.086	0.032	36.3%	0.247	0.027	0.3%	0.002	0.017	0.3%	0.005	0.028
12-19	12.6%	0.050	0.017	40.4%	0.187	0.014	0.5%	0.003	0.019	1.4%	0.011	0.027
20-39	17.0%	0.057	0.009	44.4%	0.231	0.010	0.7%	0.005	0.012	1.0%	0.008	0.016
40-69	19.8%	0.070	0.008	51.0%	0.264	0.010	1.5%	0.010	0.013	1.8%	0.008	0.010
70 +	14.8%	0.055	0.016	37.4%	0.203	0.017	1.9%	0.008	0.019	2.7%	0.015	0.021
Season												
Fall	14.3%	0.056	0.014	38.1%	0.175	0.010	0.8%	0.004	0.010	0.9%	0.004	0.009
Spring	15.8%	0.060	0.009	43.5%	0.259	0.011	1.0%	0.008	0.015	0.8%	0.009	0.020
Summer	19.0%	0.092	0.014	42.3%	0.218	0.012	0.9%	0.006	0.014	2.2%	0.016	0.015
Winter	14.3%	0.044	0.010	41.5%	0.243	0.013	1.0%	0.007	0.013	1.3%	0.006	0.012
Urbanization												
Central City	15.1%	0.061	0.011	37.9%	0.196	0.009	0.5%	0.004	0.011	1.0%	0.004	0.008
Nonmetropolitan	15.1%	0.071	0.013	39.9%	0.221	0.012	1.5%	0.015	0.018	1.8%	0.013	0.015
Suburban	16.7%	0.060	0.008	44.6%	0.242	0.009	0.9%	0.004	0.007	1.2%	0.010	0.012
Race												
Asian	16.1%	0.065	0.036	40.3%	0.231	0.050	0.0%	0	0	4.7%	0.084	0.074
Black	7.8%	0.040	0.021	27.1%	0.134	0.014	0.9%	0.006	0.021	2.1%	0.024	0.029
Native American	6.4%	0.037	0.042	42.7%	0.146	0.034	0.0%	0	0	0.0%	0	0
Other/NA	10.9%	0.038	0.029	41.1%	0.186	0.027	0.0%	0	0	1.7%	0.004	0.023
White	17.5%	0.067	0.007	43.7%	0.239	0.007	1.0%	0.006	0.007	1.1%	0.006	0.007
Region												
Midwest	15.1%	0.074	0.014	36.1%	0.191	0.012	0.4%	0.005	0.019	0.2%	0	0.004
Northeast	18.9%	0.097	0.018	43.9%	0.246	0.014	0.5%	0.003	0.013	0.6%	0.009	0.031
South	13.8%	0.042	0.007	39.3%	0.210	0.009	1.8%	0.011	0.011	3.2%	0.016	0.010
West	17.2%	0.050	0.011	48.7%	0.263	0.013	0.5%	0.002	0.009	0.2%	0.005	0.022

Table 9-5. Per Capita Intake of Fruits and Vegetables (g/kg-day as consumed) (continued)

Population Group	Onions			Other Berries			Peaches			Pears		
	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
Total	17.4%	0.040	0.003	2.5%	0.029	0.017	8.6%	0.131	0.019	4.8%	0.098	0.036
Age (years)												
< 01	1.9%	0.004	0.022	0.9%	0.092	0.369	14.2%	0.855	0.268	12.3%	1.286	0.598
01-02	6.4%	0.012	0.017	1.3%	0.053	0.248	8.9%	0.286	0.158	2.7%	0.105	0.243
03-05	8.0%	0.023	0.016	2.2%	0.039	0.073	10.0%	0.283	0.121	4.5%	0.144	0.141
06-11	9.7%	0.033	0.015	1.4%	0.014	0.056	13.8%	0.250	0.063	7.8%	0.147	0.057
12-19	12.2%	0.030	0.010	0.8%	0.011	0.029	6.9%	0.084	0.037	3.4%	0.025	0.027
20-39	20.5%	0.040	0.005	2.3%	0.024	0.030	4.2%	0.037	0.019	2.4%	0.026	0.019
40-69	24.0%	0.054	0.005	3.2%	0.031	0.023	8.7%	0.090	0.021	5.2%	0.062	0.022
70 +	16.5%	0.043	0.012	5.1%	0.049	0.040	16.1%	0.161	0.033	7.8%	0.087	0.037
Season												
Fall	16.3%	0.045	0.007	2.6%	0.024	0.023	6.4%	0.113	0.043	5.5%	0.159	0.107
Spring	19.7%	0.040	0.005	1.9%	0.019	0.024	8.4%	0.107	0.037	4.3%	0.071	0.041
Summer	18.7%	0.040	0.005	3.4%	0.032	0.027	12.5%	0.166	0.033	4.2%	0.076	0.066
Winter	14.8%	0.033	0.006	2.0%	0.042	0.058	7.4%	0.136	0.041	5.1%	0.088	0.039
Urbanization												
Central City	16.4%	0.043	0.006	2.9%	0.033	0.030	7.3%	0.121	0.035	4.5%	0.120	0.091
Nonmetropolitan	15.7%	0.033	0.005	1.6%	0.016	0.019	9.8%	0.156	0.034	5.4%	0.083	0.033
Suburban	19.1%	0.041	0.004	2.7%	0.033	0.028	8.8%	0.125	0.029	4.6%	0.092	0.050
Race												
Asian	20.8%	0.090	0.042	2.7%	0.014	0.057	6.7%	0.202	0.235	2.7%	0.053	0.151
Black	9.6%	0.034	0.014	0.9%	0.008	0.034	5.6%	0.111	0.053	2.9%	0.066	0.056
Native American	5.3%	0.018	0.022	2.3%	0.072	0.165	9.9%	0.192	0.158	1.2%	0.003	0.053
Other/NA	15.1%	0.057	0.022	0.9%	0.015	0.069	4.3%	0.118	0.145	5.1%	0.063	0.089
White	19.0%	0.039	0.003	2.8%	0.033	0.019	9.3%	0.132	0.021	5.2%	0.106	0.042
Region												
Midwest	13.8%	0.033	0.006	2.3%	0.022	0.020	9.6%	0.155	0.040	6.0%	0.121	0.054
Northeast	20.6%	0.057	0.009	3.2%	0.023	0.024	9.0%	0.132	0.048	5.7%	0.108	0.064
South	17.2%	0.034	0.004	1.7%	0.030	0.037	7.9%	0.113	0.027	3.6%	0.051	0.023
West	19.2%	0.039	0.006	3.3%	0.043	0.045	8.3%	0.131	0.042	4.5%	0.142	0.142

Table 9-5. Per Capita Intake of Individual Fruits and Vegetables (g/kg-day as consumed) (continued)

Population Group	Peas			Peppers			Pumpkins			Snap Beans		
	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
Total	12.8%	0.095	0.009	6.5%	0.022	0.005	1.0%	0.026	0.032	21.5%	0.146	0.008
Age (years)												
< 01	13.7%	0.294	0.142	0.7%	0.003	0.025	5.2%	0.497	0.363	16.7%	0.439	0.154
01-02	13.6%	0.174	0.083	2.4%	0.011	0.031	0.4%	0.030	0.253	24.9%	0.383	0.070
03-05	12.9%	0.199	0.077	3.0%	0.014	0.032	0.7%	0.018	0.148	25.0%	0.274	0.048
06-11	13.2%	0.120	0.029	4.7%	0.019	0.016	0.4%	0.012	0.118	25.6%	0.183	0.024
12-19	8.4%	0.053	0.021	5.3%	0.017	0.014	0.2%	0	0.007	18.3%	0.112	0.018
20-39	10.9%	0.067	0.013	7.9%	0.026	0.009	0.6%	0.007	0.026	19.0%	0.096	0.010
40-69	14.8%	0.084	0.011	8.6%	0.027	0.008	1.2%	0.011	0.018	22.3%	0.124	0.011
70 +	16.4%	0.117	0.024	4.7%	0.010	0.008	1.7%	0.034	0.053	25.5%	0.149	0.019
Season												
Fall	13.2%	0.120	0.023	6.0%	0.023	0.009	1.9%	0.043	0.056	21.5%	0.164	0.018
Spring	12.6%	0.077	0.015	7.3%	0.021	0.009	0.6%	0.034	0.105	18.9%	0.109	0.013
Summer	11.2%	0.074	0.019	7.9%	0.023	0.009	0.4%	0.012	0.064	22.3%	0.147	0.016
Winter	14.1%	0.111	0.017	4.7%	0.019	0.010	1.0%	0.015	0.037	23.7%	0.163	0.017
Urbanization												
Central City	11.7%	0.085	0.018	6.5%	0.023	0.009	1.1%	0.035	0.068	20.2%	0.133	0.015
Nonmetropolitan	14.5%	0.113	0.020	6.0%	0.017	0.006	0.5%	0.015	0.068	22.3%	0.141	0.013
Suburban	12.5%	0.094	0.014	6.8%	0.023	0.007	1.3%	0.025	0.041	22.0%	0.156	0.013
Race												
Asian	8.1%	0.047	0.071	8.1%	0.102	0.112	0.7%	0.005	0.057	13.4%	0.059	0.050
Black	17.0%	0.143	0.032	3.6%	0.005	0.007	0.3%	0.037	0.238	24.1%	0.188	0.022
Native American	2.9%	0.007	0.035	5.3%	0.015	0.031	0.0%	0	0	21.1%	0.119	0.048
Other/NA	6.9%	0.037	0.058	11.1%	0.037	0.024	0.9%	0.024	0.208	15.1%	0.168	0.073
White	12.5%	0.092	0.010	6.8%	0.022	0.005	1.2%	0.025	0.030	21.5%	0.140	0.009
Region												
Midwest	10.9%	0.071	0.014	4.7%	0.016	0.011	1.2%	0.027	0.050	22.4%	0.146	0.014
Northeast	12.5%	0.101	0.026	9.0%	0.036	0.012	1.4%	0.061	0.106	19.7%	0.131	0.020
South	16.2%	0.126	0.017	5.8%	0.015	0.006	0.5%	0.002	0.026	24.3%	0.177	0.014
West	9.5%	0.067	0.018	7.6%	0.025	0.010	1.3%	0.030	0.060	17.5%	0.107	0.019

Table 9-5. Per Capita Intake of Individual Fruits and Vegetables (g/kg-day as consumed) (continued)

Population Group	Strawberries Percent Consuming	Strawberries Mean	Strawberries SE	Tomatoes Percent Consuming	Tomatoes Mean	Tomatoes SE	White Potatoes Percent Consuming	White Potatoes Mean	White Potatoes SE
Total	3.4%	0.039	0.019	91.8%	0.876	0.010	87.6%	1.093	0.013
Age (years)									
< 01	0.7%	0.018	0.154	64.2%	1.116	0.094	59.9%	1.102	0.128
01-02	1.6%	0.155	0.598	93.8%	1.838	0.103	84.2%	2.228	0.113
03-05	3.2%	0.045	0.080	94.9%	1.700	0.072	88.1%	1.817	0.086
06-11	3.3%	0.052	0.058	95.2%	1.160	0.032	90.5%	1.702	0.058
12-19	2.3%	0.016	0.028	95.5%	0.852	0.022	90.1%	1.238	0.042
20-39	2.7%	0.028	0.020	94.7%	0.791	0.013	88.6%	0.897	0.018
40-69	4.5%	0.042	0.020	90.6%	0.673	0.013	88.1%	0.882	0.018
70 +	5.8%	0.050	0.040	87.2%	0.689	0.027	88.9%	0.865	0.031
Season									
Fall	1.3%	0.008	0.017	92.5%	0.907	0.021	88.9%	1.169	0.027
Spring	7.7%	0.105	0.045	90.6%	0.808	0.018	86.3%	1.036	0.024
Summer	2.2%	0.030	0.032	92.4%	0.946	0.019	86.5%	1.001	0.029
Winter	2.5%	0.013	0.015	91.9%	0.844	0.018	88.7%	1.167	0.024
Urbanization									
Central City	2.8%	0.028	0.020	91.5%	0.827	0.017	84.7%	1.017	0.025
Nonmetropolitan	3.8%	0.052	0.029	90.7%	0.827	0.018	89.4%	1.211	0.027
Suburban	3.6%	0.040	0.035	92.8%	0.931	0.015	88.5%	1.087	0.019
Race									
Asian	3.4%	0.395	1.152	90.6%	1.147	0.110	77.2%	0.446	0.062
Black	1.5%	0.031	0.056	87.4%	0.713	0.027	83.3%	1.202	0.047
Native American	1.8%	0.023	0.120	84.2%	0.890	0.073	85.4%	1.735	0.134
Other/NA	1.4%	0.007	0.042	91.4%	1.004	0.049	77.1%	1.036	0.080
White	3.9%	0.037	0.013	92.8%	0.892	0.011	88.9%	1.082	0.014
Region									
Midwest	4.8%	0.051	0.025	92.2%	0.814	0.019	89.2%	1.246	0.029
Northeast	3.3%	0.059	0.079	93.0%	0.988	0.024	86.6%	1.090	0.030
South	2.6%	0.025	0.019	90.7%	0.831	0.016	88.5%	1.074	0.021
West	3.3%	0.028	0.025	92.3%	0.914	0.021	85.1%	0.946	0.026

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-6. Per Capita Intake of USDA Categories of Fruits and Vegetables (g/kg-day as consumed)

Population Group	Dark Green Vegetables			Deep Yellow Vegetables			Citrus Fruits			Other Fruits			Other Vegetables		
	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE	Percent Consuming	Mean	SE
Total	19.1%	0.180	0.012	20.0%	0.147	0.010	38.0%	1.236	0.039	57.7%	2.141	0.063	83.1%	1.316	0.016
Age (years)															
< 01	7.5%	0.180	0.177	10.1%	0.178	0.157	24.8%	1.929	0.586	61.6%	12.855	1.284	41.7%	1.346	0.200
01-02	12.4%	0.364	0.137	14.4%	0.281	0.109	43.6%	4.237	0.459	66.4%	7.599	0.498	73.6%	2.077	0.136
03-05	14.8%	0.390	0.119	16.3%	0.177	0.063	41.0%	2.596	0.267	70.0%	5.826	0.348	78.9%	1.979	0.102
06-11	13.3%	0.150	0.044	19.1%	0.185	0.043	40.5%	1.805	0.138	70.1%	3.242	0.126	83.2%	1.534	0.062
12-19	14.3%	0.112	0.030	14.0%	0.080	0.020	37.0%	1.130	0.085	47.3%	1.053	0.070	81.0%	0.950	0.035
20-39	18.8%	0.137	0.016	17.5%	0.100	0.015	33.4%	0.903	0.049	44.9%	0.972	0.042	84.1%	1.081	0.022
40-69	24.4%	0.187	0.016	24.8%	0.164	0.017	39.9%	0.864	0.045	60.9%	1.255	0.038	88.3%	1.374	0.026
70 +	24.6%	0.255	0.034	29.4%	0.245	0.028	46.8%	1.155	0.069	76.1%	1.827	0.067	87.7%	1.615	0.046
Season															
Fall	19.6%	0.169	0.023	22.7%	0.156	0.020	38.3%	1.211	0.074	57.6%	2.354	0.171	82.5%	1.276	0.032
Spring	21.0%	0.187	0.020	19.7%	0.144	0.023	38.4%	1.225	0.072	56.4%	2.024	0.102	83.3%	1.297	0.030
Summer	15.4%	0.182	0.029	15.6%	0.094	0.017	33.8%	1.136	0.093	60.8%	2.245	0.112	83.1%	1.332	0.032
Winter	20.0%	0.180	0.024	21.9%	0.192	0.023	41.3%	1.371	0.073	56.0%	1.943	0.106	83.4%	1.361	0.031
Urbanization															
Central City	20.5%	0.197	0.021	18.6%	0.133	0.019	39.8%	1.187	0.072	55.3%	2.090	0.100	81.4%	1.245	0.027
Nonmetropolitan	16.0%	0.133	0.020	18.4%	0.138	0.021	34.2%	1.153	0.074	57.8%	1.954	0.100	83.2%	1.407	0.033
Suburban	19.9%	0.190	0.019	22.0%	0.160	0.016	39.1%	1.306	0.058	59.2%	2.262	0.110	84.1%	1.319	0.023
Race															
Asian	30.9%	0.327	0.127	29.5%	0.221	0.118	51.0%	2.479	0.453	69.8%	3.360	0.547	85.2%	2.228	0.205
Black	25.9%	0.318	0.039	12.5%	0.104	0.029	40.1%	1.474	0.135	46.2%	1.806	0.156	78.1%	1.232	0.044
Native American	9.4%	0.126	0.092	10.5%	0.081	0.060	33.3%	0.945	0.219	50.9%	2.375	0.431	75.4%	1.077	0.107
Other/NA	15.1%	0.224	0.087	13.4%	0.106	0.071	40.3%	1.439	0.229	52.0%	2.589	0.452	76.3%	1.116	0.104
White	18.1%	0.156	0.012	21.6%	0.154	0.011	37.4%	1.178	0.041	59.8%	2.154	0.071	84.2%	1.326	0.017
Region															
Midwest	12.6%	0.125	0.026	18.7%	0.128	0.020	35.5%	1.099	0.077	59.8%	2.137	0.108	81.2%	1.186	0.029
Northeast	21.1%	0.185	0.026	22.1%	0.175	0.026	45.6%	1.430	0.079	60.5%	2.235	0.132	84.5%	1.445	0.040
South	20.5%	0.206	0.021	16.8%	0.119	0.018	33.5%	1.090	0.067	50.3%	1.927	0.095	83.2%	1.346	0.026
West	22.6%	0.195	0.022	25.2%	0.187	0.021	41.8%	1.449	0.092	65.0%	2.414	0.182	83.8%	1.293	0.033

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-7. Per Capita Intake of Exposed Fruits (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	44.1%	1.435	0.062	0	0	0	0	0	1.402	3.496	6.075	17.823	204.28
Age (years)													
< 01	54.7%	9.224	1.247	0	0	0	0	2.897	12.336	26.98	33.216	75.353	204.28
01-02	55.3%	5.682	0.486	0	0	0	0	2.897	8.598	15.187	19.107	33.353	80.189
03-05	56.9%	4.324	0.344	0	0	0	0	2.305	5.766	11.65	19.049	24.123	48.728
06-11	58.8%	2.316	0.12	0	0	0	0	1.379	3.32	5.879	8.585	15.318	25.367
12-19	36.4%	0.682	0.065	0	0	0	0	0	0.871	2.158	3.214	6.703	10.766
20-39	32.7%	0.596	0.038	0	0	0	0	0	0.754	1.984	2.858	5.911	28.486
40-69	44.3%	0.716	0.031	0	0	0	0	0	1.102	2.139	3.048	5.127	13.206
70 +	57.7%	1.032	0.058	0	0	0	0	0.534	1.452	2.894	4.042	6.983	10.631
Season													
Fall	45.5%	1.753	0.179	0	0	0	0	0	1.521	3.64	7.537	25.206	204.28
Spring	42.6%	1.184	0.078	0	0	0	0	0	1.283	3.208	5.505	14.872	84.336
Summer	45.3%	1.44	0.113	0	0	0	0	0	1.389	3.451	6.313	17.427	98.133
Winter	43.0%	1.362	0.097	0	0	0	0	0	1.441	3.54	5.703	18.752	59.848
Urbanization													
Central City	42.4%	1.322	0.088	0	0	0	0	0	1.328	3.481	6.075	15.927	80.189
Nonmetropolitan	44.0%	1.335	0.097	0	0	0	0	0	1.445	3.32	5.505	16.057	84.336
Suburban	45.3%	1.553	0.112	0	0	0	0	0	1.442	3.686	6.614	20.444	204.28
Race													
Asian	52.3%	2.118	0.541	0	0	0	0	0.654	1.674	4.299	8.678	25.206	27.337
Black	34.6%	1.132	0.149	0	0	0	0	0	1.045	2.888	4.618	17.351	80.189
Native American	35.7%	0.939	0.316	0	0	0	0	0	0.922	2.271	4.157	15.635	17.684
Other/NA	34.0%	1.614	0.408	0	0	0	0	0	1.659	4.084	8.529	35.073	36.71
White	46.1%	1.468	0.07	0	0	0	0	0	1.441	3.593	6.104	17.427	204.28
Region													
Midwest	47.3%	1.422	0.091	0	0	0	0	0	1.645	3.501	6.114	16.438	84.336
Northeast	47.3%	1.518	0.118	0	0	0	0	0	1.49	3.898	6.834	19.393	75.353
South	36.9%	1.271	0.092	0	0	0	0	0	1.177	3.104	5.695	19.91	80.189
West	49.4%	1.643	0.198	0	0	0	0	0	1.443	3.774	7.009	15.947	204.28

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-8. Per Capita Intake of Protected Fruits (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	52.9%	1.692	0.037	0	0	0	0	0.598	2.316	4.687	6.717	13.019	136.69
Age (years)													
< 01	38.9%	3.097	0.528	0	0	0	0	0	4.353	9.963	15.242	23.624	136.69
01-02	56.7%	5.518	0.455	0	0	0	0	2.618	9.049	15.677	20.912	27.432	49.904
03-05	57.0%	3.443	0.235	0	0	0	0	1.948	5.606	9.826	13.018	17.729	35.141
06-11	56.2%	2.339	0.125	0	0	0	0	1.079	3.727	6.92	8.688	12.807	27.945
12-19	47.7%	1.401	0.081	0	0	0	0	0.598	2.234	4.341	5.761	7.894	15.503
20-39	45.4%	1.188	0.047	0	0	0	0	0.108	1.694	3.645	4.844	8.205	29.275
40-69	57.3%	1.284	0.043	0	0	0	0	0.583	2.009	3.541	4.596	7.719	21.372
70 +	67.5%	1.78	0.072	0	0	0	0	1.236	2.706	4.363	5.779	8.611	15.003
Season													
Fall	50.2%	1.539	0.071	0	0	0	0	0.269	2.04	4.323	6.509	13.595	26.751
Spring	53.9%	1.75	0.072	0	0	0	0	0.688	2.407	4.681	6.787	13.032	44.68
Summer	54.1%	1.754	0.082	0	0	0	0	0.672	2.471	4.732	6.571	15.503	136.69
Winter	53.7%	1.727	0.071	0	0	0	0	0.621	2.423	4.941	6.905	12.166	30.692
Urbanization													
Central City	53.3%	1.632	0.069	0	0	0	0	0.625	2.276	4.497	6.099	11.535	136.69
Nonmetropolitan	49.4%	1.55	0.069	0	0	0	0	0.334	2.115	4.368	6.961	12.076	29.275
Suburban	54.7%	1.797	0.056	0	0	0	0	0.667	2.472	4.897	6.826	14.399	44.68
Race													
Asian	69.8%	3.279	0.429	0	0	0	0	2.052	4.382	6.981	17.729	17.729	18.792
Black	49.6%	1.861	0.126	0	0	0	0	0.621	2.695	5.64	7.241	13.572	136.69
Native American	46.8%	2.019	0.33	0	0	0	0	0.851	2.701	5.995	10.354	11.554	15.244
Other/NA	51.7%	2.014	0.263	0	0	0	0	0.845	2.472	5.759	8.88	14.279	44.68
White	53.4%	1.629	0.039	0	0	0	0	0.574	2.238	4.527	6.425	12.53	49.904
Region													
Midwest	49.5%	1.501	0.072	0	0	0	0	0.265	2.07	4.353	6.099	12.53	49.904
Northeast	59.4%	1.887	0.08	0	0	0	0	0.838	2.675	5.371	7.268	13.018	42.347
South	47.6%	1.56	0.064	0	0	0	0	0.465	2.147	4.443	6.39	12.076	136.69
West	60.1%	1.947	0.084	0	0	0	0	0.854	2.613	4.88	7.836	16.064	44.68

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-9. Per Capita Intake of Exposed Vegetables (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	84.9%	1.49	0.016	0	0	0	0.367	1.043	2.067	3.403	4.515	7.727	20.492
Age (years)													
< 01	42.7%	1.208	0.17	0	0	0	0	0	1.55	3.834	6.451	11.524	18.592
01-02	78.0%	2.268	0.145	0	0	0	0.299	1.132	3.616	5.855	7.404	12.808	20.492
03-05	83.6%	2.245	0.119	0	0	0	0.329	1.411	3.061	5.433	7.664	12.493	17.872
06-11	84.7%	1.606	0.059	0	0	0	0.293	1.062	2.222	3.769	5.118	9.161	15.741
12-19	83.6%	1.181	0.04	0	0	0	0.253	0.804	1.696	2.756	3.84	5.699	12.139
20-39	86.3%	1.3	0.025	0	0	0	0.331	0.923	1.87	2.968	3.692	6.327	14.837
40-69	89.9%	1.568	0.026	0	0	0.07	0.557	1.22	2.177	3.42	4.443	6.274	13.624
70 +	86.4%	1.603	0.044	0	0	0	0.672	1.326	2.214	3.344	4.206	5.928	12.814
Season													
Fall	82.8%	1.383	0.033	0	0	0	0.29	0.951	1.824	3.151	4.283	8.783	18.592
Spring	85.0%	1.475	0.031	0	0	0	0.383	1.028	2.075	3.406	4.562	7.403	20.492
Summer	87.1%	1.634	0.033	0	0	0	0.432	1.272	2.289	3.68	4.765	7.399	18.283
Winter	84.9%	1.468	0.033	0	0	0	0.367	0.999	2.09	3.109	4.464	7.664	16.152
Urbanization													
Central City	83.6%	1.413	0.029	0	0	0	0.302	0.957	1.952	3.278	4.331	8.17	20.492
Nonmetropolitan	85.8%	1.55	0.031	0	0	0	0.471	1.185	2.146	3.499	4.59	7.283	17.872
Suburban	85.2%	1.511	0.025	0	0	0	0.356	1.055	2.098	3.464	4.683	7.664	16.152
Race													
Asian	83.2%	2.133	0.195	0	0	0	0.606	1.537	3.135	4.746	6.883	10.325	11.841
Black	81.8%	1.472	0.051	0	0	0	0.308	0.908	1.88	3.217	4.989	9.219	16.141
Native American	75.4%	1.501	0.141	0	0	0	0.168	1.018	2.423	3.445	4.155	6.424	8.189
Other/NA	85.4%	1.682	0.092	0	0	0	0.338	1.287	2.748	3.644	4.697	6.933	8.368
White	85.6%	1.476	0.017	0	0	0	0.371	1.045	2.067	3.376	4.464	7.359	20.492
Region													
Midwest	80.9%	1.215	0.029	0	0	0	0.239	0.824	1.683	2.843	3.834	6.35	20.492
Northeast	84.7%	1.561	0.041	0	0	0	0.378	1.051	2.126	3.564	4.994	8.243	18.283
South	86.7%	1.609	0.027	0	0	0	0.434	1.208	2.254	3.575	4.562	7.404	14.568
West	86.6%	1.546	0.035	0	0	0	0.424	1.127	2.158	3.524	4.7	7.664	16.152

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-10. Per Capita Intake of Protected Vegetables (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	34.0%	0.332	0.012	0	0	0	0	0	0.414	1.038	1.637	3.394	14.4
Age (years)													
< 01	30.9%	1.144	0.192	0	0	0	0	0	1.435	4.584	6.25	8.752	14.4
01-02	41.6%	0.794	0.104	0	0	0	0	0	1.201	2.232	3.766	6.488	9.74
03-05	39.8%	0.703	0.081	0	0	0	0	0	1.205	2.443	3.053	4.811	11.3
06-11	44.3%	0.5	0.035	0	0	0	0	0	0.848	1.439	2.058	3.32	8.6
12-19	30.1%	0.229	0.025	0	0	0	0	0	0.332	0.824	1.339	2.138	4.94
20-39	31.6%	0.233	0.015	0	0	0	0	0	0.323	0.78	1.161	2.427	5.6
40-69	32.4%	0.239	0.014	0	0	0	0	0	0.362	0.772	1.164	2.033	6.25
70 +	34.6%	0.303	0.028	0	0	0	0	0	0.427	1.015	1.491	2.291	5.34
Season													
Fall	34.1%	0.336	0.025	0	0	0	0	0	0.394	1.064	1.725	3.674	11.3
Spring	34.8%	0.32	0.024	0	0	0	0	0	0.421	0.96	1.435	3.493	14.4
Summer	32.5%	0.334	0.024	0	0	0	0	0	0.411	1.116	1.7	3.492	10.4
Winter	34.4%	0.337	0.022	0	0	0	0	0	0.42	1.109	1.724	2.945	8.68
Urbanization													
Central City	31.7%	0.303	0.022	0	0	0	0	0	0.354	0.971	1.619	3.098	14.4
Nonmetropolitan	37.9%	0.396	0.024	0	0	0	0	0	0.514	1.22	1.725	3.826	11.3
Suburban	33.1%	0.32	0.018	0	0	0	0	0	0.39	1.029	1.591	3.32	14.1
Race													
Asian	16.1%	0.166	0.081	0	0	0	0	0	0	0.636	1.201	1.506	3.17
Black	37.3%	0.411	0.038	0	0	0	0	0	0.502	1.29	2.014	4.579	9.07
Native American	32.7%	0.38	0.095	0	0	0	0	0	0.446	1.062	1.826	2.85	4.64
Other/NA	22.9%	0.221	0.074	0	0	0	0	0	0	0.644	1.369	2.767	5.6
White	34.1%	0.326	0.013	0	0	0	0	0	0.413	1.014	1.587	3.317	14.4
Region													
Midwest	35.8%	0.344	0.022	0	0	0	0	0	0.46	1.127	1.674	3.013	11.3
Northeast	32.4%	0.369	0.036	0	0	0	0	0	0.376	1.102	1.835	5.022	14.1
South	36.8%	0.358	0.019	0	0	0	0	0	0.48	1.093	1.726	3.484	14.4
West	28.4%	0.236	0.022	0	0	0	0	0	0.178	0.791	1.257	2.688	6.25

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-11. Per Capita Intake of Root Vegetables (g/kg-day as consumed)

Population Group	Percent Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Total	80.7%	1.245	0.015	0	0	0	0.226	0.832	1.675	2.974	4.029	7.074	30.609
Age (years)													
< 01	52.4%	1.857	0.204	0	0	0	0	0.184	2.66	5.337	8.233	12.5	30.609
01-02	76.2%	2.398	0.129	0	0	0	0.52	1.879	3.542	5.695	7.084	10.449	16.27
03-05	77.9%	1.914	0.096	0	0	0	0.203	1.344	2.998	4.596	6.14	7.505	17.416
06-11	84.4%	1.85	0.065	0	0	0	0.381	1.23	2.638	4.449	6.018	8.165	17.107
12-19	81.4%	1.29	0.045	0	0	0	0.279	0.909	1.739	3.051	4.177	5.74	24.949
20-39	81.6%	0.988	0.02	0	0	0	0.182	0.717	1.37	2.385	3.096	5.025	8.002
40-69	82.8%	1.059	0.021	0	0	0	0.244	0.807	1.488	2.454	3.087	4.983	9.043
70 +	80.6%	1.109	0.04	0	0	0	0.312	0.821	1.549	2.535	3.203	5.636	10.723
Season													
Fall	80.6%	1.324	0.032	0	0	0	0.213	0.893	1.756	3.238	4.402	7.484	15.625
Spring	80.5%	1.204	0.029	0	0	0	0.228	0.858	1.557	2.752	3.889	6.644	30.609
Summer	80.3%	1.102	0.031	0	0	0	0.152	0.655	1.452	2.669	3.858	7.751	24.949
Winter	81.5%	1.348	0.029	0	0	0	0.339	0.97	1.953	3.1	4.137	5.989	17.416
Urbanization													
Central City	77.6%	1.167	0.029	0	0	0	0.176	0.755	1.545	2.826	3.903	7.505	30.609
Nonmetropolitan	82.3%	1.33	0.03	0	0	0	0.311	0.893	1.795	3.256	4.422	6.946	19.449
Suburban	81.9%	1.254	0.023	0	0	0	0.21	0.861	1.708	2.972	4.017	7.079	17.416
Race													
Asian	55.0%	0.743	0.146	0	0	0	0	0.274	0.814	1.764	3.546	7.269	10.702
Black	73.8%	1.309	0.052	0	0	0	0.134	0.761	1.627	3.337	5.358	7.968	17.534
Native American	78.9%	1.791	0.137	0	0	0	0.655	1.47	2.762	3.858	4.705	7.067	13.578
Other/NA	65.4%	1.239	0.11	0	0	0	0	0.635	1.75	3.38	4.861	8.253	10.415
White	82.9%	1.237	0.016	0	0	0	0.25	0.858	1.673	2.887	3.942	6.651	30.609
Region													
Midwest	82.2%	1.361	0.033	0	0	0	0.29	0.889	1.844	3.238	4.386	7.968	19.449
Northeast	80.2%	1.304	0.037	0	0	0	0.21	0.912	1.781	3.212	4.246	7.022	24.949
South	81.2%	1.183	0.024	0	0	0	0.25	0.796	1.591	2.82	3.906	6.926	30.609
West	78.5%	1.15	0.032	0	0	0	0.146	0.786	1.56	2.673	3.683	7.269	13.578

NOTE: SE = Standard error
P = Percentile of the distribution
Source: Based on EPA's analyses of the 1989-91 CSFII

Table 9-12. Mean Daily Intake of Fruits and Vegetables Per Individual in a Day for USDA 1977-78, 87-88, 89-91, 94, and 95 Surveys

Food Product	77-78 Data (g/day)	87-88 Data (g/day)	89-91 Data (g/day)	94 Data (g/day)	95 Data (g/day)
Fruits	142	142	156	171	173
Vegetables	201	182	179	186	188

Source: USDA, 1980; 1992; 1996a; 1996b.

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Alfalfa Sprouts	0.0001393	0.0000319
Apples-Dried	0.0002064	0.0000566
Apples-Fresh	0.4567290	0.0142203
Apples-Juice	0.2216490	0.0142069
Apricots-Dried	0.0004040	0.0001457
Apricots-Fresh	0.0336893	0.0022029
Artichokes-Globe	0.0032120	0.0007696
Artichokes-Jerusalem	0.0000010	*
Asparagus	0.0131098	0.0010290
Avocados	0.0125370	0.0020182
Bamboo Shoots	0.0001464	0.0000505
Bananas-Dried	0.0004489	0.0001232
Bananas-Fresh	0.2240382	0.0088206
Bananas-Unspecified	0.0032970	0.0004938
Beans-Dry-Blackeye Peas (cowpeas)	0.0024735	0.0005469
Beans-Dry-Broad Beans (Mature Seed)	0.0000000	*
Beans-Dry-Garbanzo (Chick Pea)	0.0005258	0.0001590
Beans-Dry-Great Northern	0.0000010	*
Beans-Dry-Hyacinth (Mature Seeds)	0.0000000	*
Beans-Dry-Kidney	0.0136313	0.0045628
Beans-Dry-Lima	0.0079892	0.0016493
Beans-Dry-Navy (Pea)	0.0374073	0.0023595
Beans-Dry-Other	0.0398251	0.0023773
Beans-Dry-Pigeon Beans	0.0000357	0.0000357
Beans-Dry-Pinto	0.0363498	0.0048479
Beans-Succulent-Broad Beans (Immature Seed)	0.0000000	*
Beans-Succulent-Green	0.2000500	0.0062554
Beans-Succulent-Hyacinth (Young Pods)	0.0000000	*
Beans-Succulent-Lima	0.0256648	0.0021327
Beans-Succulent-Other	0.0263838	0.0042782
Beans-Succulent-Yellow, Wax	0.0054634	0.0009518
Beans-Unspecified	0.0052345	0.0012082

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups (continued)

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Beets-Roots	0.0216142	0.0014187
Beets-Tops (Greens)	0.0008287	0.0003755
Bitter Melon	0.0000232	0.0000233
Blackberries	0.0064268	0.0007316
Blueberries	0.0090474	0.0008951
Boysenberries	0.0007313	0.0006284
Bread Nuts	0.0000010	*
Bread Fruit	0.0000737	0.0000590
Broccoli	0.0491295	0.0032966
Brussel Sprouts	0.0068480	0.0009061
Cabbage-Chinese/Celery, Inc. Bok Choy	0.0045632	0.0020966
Cabbage-Green and Red	0.0936402	0.0039046
Cactus Pads	0.0000010	*
Cantaloupes	0.0444220	0.0029515
Carambola	0.0000010	*
Carob	0.0000913	0.0000474
Carrots	0.1734794	0.0041640
Casabas	0.0007703	0.0003057
Cassava (Yuca Blanca)	0.0002095	0.00001574
Cauliflower	0.0158368	0.0011522
Celery	0.0609611	0.0014495
Cherimoya	0.0000010	*
Cherries-Dried	0.0000010	*
Cherries-Fresh	0.0321754	0.0024966
Cherries-Juice	0.0034080	0.0009078
Chicory (French or Belgian Endive)	0.0006707	0.0001465
Chili Peppers	0.0000000	*
Chives	0.0000193	0.0000070
Citrus Citron	0.0001573	0.0000324
Coconut-Copra	0.0012860	0.0000927
Coconut-Fresh	0.0001927	0.0000684
Coconut-Water	0.0000005	0.0000005

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups (continued)

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Collards	0.0188966	0.0032628
Corn, Pop	0.0067714	0.0003348
Corn, Sweet	0.2367071	0.0062226
Crabapples	0.0003740	*
Cranberries	0.0150137	0.0006153
Cranberries-Juice	0.0170794	0.0022223
Crenshaws	0.0000010	*
Cress, Upland	0.0000010	*
Cress, Garden, Field	0.0000000	*
Cucumbers	0.0720821	0.0034389
Currants	0.0005462	0.0000892
Dandelion	0.0005039	0.0002225
Dates	0.0006662	0.0001498
Dewberries	0.0023430	*
Eggplant	0.0061858	0.0007645
Elderberries	0.0001364	0.0001365
Endive, Curley and Escarole	0.0011851	0.0001929
Fennel	0.0000000	*
Figs	0.0027847	0.0005254
Garlic	0.0007621	0.0000230
Genip (Spanish Lime)	0.0000010	*
Ginkgo Nuts	0.0000010	*
Gooseberries	0.0003953	0.0001341
Grapefruit-Juice	0.0773585	0.0053846
Grapefruit-Pulp	0.0684644	0.0032321
Grapes-Fresh	0.0437931	0.0023071
Grapes-Juice	0.0900960	0.0058627
Grapes-Leaves	0.0000119	0.0000887
Grapes-Raisins	0.0169730	0.0009221
Groundcherries (Poha or Cape-Gooseberries)	0.0000000	*
Guava	0.0000945	0.0000558
Honeydew Melons	0.0183628	0.0042879

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups (continued)

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Huckleberries (Gaylussacia)	0.0000010	*
Juneberry	0.0000010	*
Kale	0.0015036	0.0006070
Kiwi	0.0000191	0.0000191
Kohlrabi	0.0002357	0.0001028
Kumquats	0.0000798	0.0000574
Lambsquarter	0.0000481	0.0000481
Leafy Oriental Vegetables	0.0000010	*
Leeks	0.0000388	0.0000221
Lemons-Juice	0.0189564	0.0009004
Lemons-Peel	0.0002570	0.0001082
Lemons-Pulp	0.0002149	0.0000378
Lemons-Unspecified	0.0020695	0.0003048
Lentiles-Split	0.0000079	0.0000064
Lentiles-Whole	0.0012022	0.0002351
Lettuce-Head Varieties	0.2122803	0.0059226
Lettuce-Leafy Varieties	0.0044328	0.0003840
Lettuce-Unspecified	0.0092008	0.0004328
Limes-Juice	0.0032895	0.0005473
Limes-Pulp	0.0000941	0.0000344
Limes-Unspecified	0.0000010	*
Loganberries	0.0002040	*
Logan Fruit	0.0000010	*
Loquats	0.0000000	*
Lychee-Dried	0.0000010	*
Lychees (Litchi)	0.0000010	*
Maney (Mammee Apple)	0.0000010	*
Mangoes	0.0005539	0.0002121
Mulberries	0.0000010	*
Mung Beans (Sprouts)	0.0066521	0.0006462
Mushrooms	0.0213881	0.0009651
Mustard Greens	0.0145284	0.0024053

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups (continued)

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Nectarines	0.0129663	0.0013460
Okra	0.0146352	0.0017782
Olives	0.0031757	0.0002457
Onions-Dehydrated or Dried	0.0001192	0.0000456
Onions-Dry-Bulb (Cipollini)	0.1060612	0.0021564
Onions-Green	0.0019556	0.0001848
Oranges-Juice	1.0947265	0.0283937
Oranges-Peel	0.0001358	0.0000085
Oranges-Pulp	0.1503524	0.0092049
Papayas-Dried	0.0009598	0.0000520
Papayas-Fresh	0.0013389	0.0005055
Papayas-Juice	0.0030536	0.0012795
Parsley Roots	0.0000010	*
Parsley	0.0036679	0.0001459
Parsnips	0.0006974	0.0001746
Passion Fruit (Granadilla)	0.0000010	*
Pawpaws	0.0000010	*
Peaches-Dried	0.0000496	0.0000152
Peaches-Fresh	0.2153916	0.0078691
Pears-Dried	0.0000475	0.0000279
Pears-Fresh	0.1224735	0.0050442
Peas (Garden)-Green Immature	0.1719997	0.0067868
Peas (Garden)-Mature Seeds, Dry	0.0017502	0.0002004
Peppers, Sweet, Garden	0.0215525	0.0010091
Peppers-Other	0.0043594	0.0004748
Persimmons	0.0004008	0.0002236
Persian Melons	0.0000010	*
Pimentos	0.0019485	0.0001482
Pineapple-Dried	0.0000248	0.0000195
Pineapple-Fresh, Pulp	0.0308283	0.0017136
Pineapple-Fresh, Juice	0.0371824	0.0026438
Pitanga (Surinam Cherry)	0.0000010	*

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups (continued)

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Plantains	0.0016370	0.0007074
Plums, Prune-Juice	0.0137548	0.0017904
Plums (Damsons)-Fresh	0.0248626	0.0020953
Plums-Prunes (Dried)	0.0058071	0.0005890
Poke Greens	0.0002957	0.0001475
Pomegranates	0.0000820	0.0000478
Potatoes (White)-Whole	0.3400582	0.0102200
Potatoes (White)-Unspecified	0.0000822	0.0000093
Potatoes (White)-Peeled	0.7842573	0.0184579
Potatoes (White)-Dry	0.0012994	0.0001896
Potatoes (White)-Peel Only	0.0000217	0.0000133
Pumpkin	0.0044182	0.0004354
Quinces	0.0001870	*
Radishes-Roots	0.0015558	0.0001505
Radishes-Tops	0.0000000	*
Raspberries	0.0028661	0.0005845
Rhubarb	0.0037685	0.0006588
Rutabagas-Roots	0.0027949	0.0009720
Rutabagas-Tops	0.0000000	*
Salsify (Oyster Plant)	0.0000028	0.0000028
Shallots	0.0000000	*
Soursop (Annona Muricata)	0.0000010	*
Soybeans-Sprouted Seeds	0.0000000	*
Spinach	0.0435310	0.0030656
Squash-Summer	0.0316479	0.0022956
Squash-Winter	0.0324417	0.0026580
Strawberries	0.0347089	0.0020514
Sugar Apples (Sweetsop)	0.0000010	*
Sweetpotatoes (including Yams)	0.0388326	0.0035926
Swiss Chard	0.0016915	0.0004642
Tangelos	0.0025555	0.0006668
Tangerine-Juice	0.0000839	0.0000567

Table 9-13. Mean Per Capita Intake Rates (as consumed) for Fruits and Vegetables Based on All Sex/Age/Demographic Subgroups (continued)

Raw Agricultural Commodity[a]	Average Consumption (Grams/kg Body Weight-Day)	Standard Error
Tangerines	0.0088441	0.0010948
Tapioca	0.0012199	0.0000951
Taro-Greens	0.0000010	*
Taro-Root	0.0000010	*
Tomatoes-Catsup	0.0420320	0.0015878
Tomatoes-Juice	0.0551351	0.0029515
Tomatoes-Paste	0.0394767	0.0012512
Tomatoes-Puree	0.17012311	0.0054679
Tomatoes-Whole	0.4920164	0.0080927
Towelgourd	0.0000010	*
Turnips-Roots	0.0082392	0.0014045
Turnips-Tops	0.0147111	0.0025845
Water Chestnuts	0.0004060	0.0000682
Watercress	0.0003553	0.0001564
Watermelon	0.0765054	0.0068930
Yambean, Tuber	0.0000422	0.0000402
Yautia, Tannier	0.0000856	0.0000571
Youngberries	0.0003570	*

* Not reported
[a] Consumed in any raw or prepared form
Source: DRES data base (based on 1977-78 NFCS data).

Table 9-14. Mean Total Fruit Intake (as consumed) in a Day by Sex and Age (1977-1978)[a]

Age (yr)	Per Capita Intake (g/day)	Percent of Population Using Fruit in a Day	Intake (g/day) for Users Only[b]
Males and Females			
1 and under	169	86.8	196
1-2	146	62.9	231
3-5	134	56.1	239
6-8	152	60.1	253
Males			
9-11	133	50.5	263
12-14	120	51.2	236
15-18	147	47.0	313
19-22	107	39.4	271
23-34	141	46.4	305
35-50	115	44.0	262
51-64	171	62.4	275
65-74	174	62.2	281
75 and over	186	62.6	197
Females			
9-11	148	59.7	247
12-14	120	48.7	247
15-18	126	49.9	251
19-22	133	48.0	278
23-34	122	47.7	255
35-50	133	52.8	252
51-64	171	66.7	256
65-74	179	69.3	259
75 and over	189	64.7	292
Males and Females			
All ages	142	54.2	263

[a] Based on USDA Nationwide Food Consumption Survey (1977-1978) data for one day.
[b] Intake for users only was calculated by dividing the per capita intake rate by the fraction of the population using fruit in a day.
Source: USDA, 1980.

Table 9-15. Mean Total Fruit Intake (as consumed) in a Day by Sex and Age (1987-1988)[a]

Age (yr)	Per Capita Intake (g/day)	Percent of Population Using Fruit in 1 Day	Intake (g/day) for Users Only[b]
Males and Females			
5 and under	157	59.2	265
Males			
6-11	182	63.8	285
12-19	158	49.4	320
20 and over	133	46.5	286
Females			
6-11	154	58.3	264
12-19	131	47.1	278
20 and over	140	52.7	266
Males and Females			
All Ages	142	51.4	276

[a] Based on USDA Nationwide Food Consumption Survey (1987-1988) data for one day.
[b] Intake for users only was calculated by dividing the per capita intake rate by the fraction of the population using fruits in a day.
Source: USDA, 1992b.

Table 9-16. Mean Total Vegetable Intake (as consumed) in a Day by Sex and Age (1977-1978)[a]

Age (yr)	Per Capita Intake (g/day)	Percent of Population Using Vegetables in a Day	Intake (g/day) for Users Only[b]
Males and Females			
1 and under	76	62.7	121
1-2	91	78.0	116
3-5	100	79.3	126
6-8	136	84.3	161
Males			
9-11	138	83.5	165
12-14	184	84.5	217
15-18	216	85.9	251
19-22	226	84.7	267
23-34	248	88.5	280
35-50	261	86.8	300
51-64	285	90.3	316
65-74	265	88.5	300
75 and over	264	93.6	281
Females			
9-11	139	83.7	166
12-14	154	84.6	183
15-18	178	83.8	212
19-22	184	81.1	227
23-34	187	84.7	221
35-50	187	84.6	221
51-64	229	89.8	255
65-74	221	87.2	253
75 & over	198	88.1	226
Males and Females			
All Ages	201	85.6	235

[a] Based on USDA Nationwide Food Consumption Survey (1977-1978) data for one day.
[b] Intake for users only was calculated by dividing the per capita intake rate by the fraction of the population using vegetables in a day.
Source: USDA, 1980.

Table 9-17. Mean Total Vegetable Intake (as consumed) in a Day by Sex and Age (1987-1988)[a]

Age (yr)	Per Capita Intake (g/day)	Percent of Population Using Vegetables in a Day	Intake (g/day) for Users Only[b]
Males and Females			
5 and under	81	74.0	109
Males			
6-11	129	86.8	149
12-19	173	85.2	203
20 and over	232	85.0	273
Females			
6-11	129	80.6	160
12-19	129	75.8	170
20 and over	183	82.9	221
Males and Females			
All Ages	182	82.6	220

[a] Based on USDA Nationwide Food Consumption Survey (1987-1988) data for one day.

[b] Intake for users only was calculated by dividing the per capita intake rate by the fraction of the population using vegetables in a day.

Source: USDA, 1992b.

Table 9-18. Mean Total Fruit Intake (as consumed) in a Day by Sex and Age (1994 and 1995)[a]

Age (yr)	Per Capita Intake (g/day)		Percent of Population Using Fruit in 1 Day		Intake (g/day) for Users Only[b]	
	1994	1995	1994	1995	1994	1995
Males and Females						
5 and under	230	221	70.6	72.6	326	304
Males						
6-11	176	219	59.8	62.2	294	352
12-19	169	210	44.0	47.1	384	446
20 and over	175	170	50.2	49.6	349	342
Females						
6-11	174	172	59.3	63.6	293	270
12-19	148	167	47.1	44.4	314	376
20 and over	157	155	55.1	54.4	285	285
Males and Females						
All Ages	171	173	54.1	54.2	316	319

[a] Based on USDA CSFII (1994 and 1995) data for one day.
[b] Intake for users only was calculated by dividing the per capita intake rate by the fraction of the population using fruits in a day.
Source: USDA, 1996a; 1996b.

Table 9-19. Mean Total Vegetable Intake (as consumed) in a Day by Sex and Age (1994 and 1995)[a]

Age (yr)	Per Capita Intake (g/day)		Percent of Population Using Vegetables in 1 Day		Intake (g/day) for Users Only[b]	
	1994	1995	1994	1995	1994	1995
Males and Females						
5 and under	80	83	75.2	75.0	106	111
Males						
6-11	118	111	82.4	80.6	143	138
12-19	154	202	74.9	79.0	206	256
20 and over	242	241	85.9	86.4	282	278
Females						
6-11	115	108	82.9	79.1	139	137
12-19	132	144	78.5	76.0	168	189
20 and over	190	189	84.7	83.2	224	227
Males and Females						
All Ages	186	188	83.2	82.6	223	228

[a] Based on USDA CSFII (1994 and 1995) data for one day.

[b] Intake for users only was calculated by dividing the per capita intake rate by the fraction of the population using vegetables in a day.

Source: USDA, 1996a; 1996b.

Table 9-20. Mean Per Capita Intake of Fats and Oils (g/day as consumed) in a Day by Sex and Age (1994 and 1995)[a]

	Total Fats and Oils[b]		Table Fats[c]		Salad Dressings[d]	
	1994	1995	1994	1995	1994	1995
Males and Females						
5 and under	4	3	2	2	2	1
Males						
6-11	8	7	3	3	5	4
12-19	11	14	2	5	8	10
20 and over	19	18	5	5	11	10
Females						
6-11	7	8	3	3	4	4
12-19	9	9	2	3	6	6
20 and over	16	14	4	5	10	7
Males and Females						
All Ages	14	14	4	4	9	8

[a] Based on USDA CSFII 1994 and 1995 data for one day.
[b] Table fats, cooking fats, vegetable oils, salad dressings, nondairy cream substitutes, sauces that are mainly fat and oil.
[c] Butter, margarines, blends of butter with margarines or vegetable oils, and butter replacements.
[d] Regular and reduced- and low-calorie dressings and mayonnaise.
Source: USDA, 1996a; 1996b.

Table 9-21. Mean and Standard Error for the Per Capita Daily Intake of Food Class and Subclass by Region (g/day as consumed)

	US population	Northeast	North Central	South	West
Total Produce	282.6 ± 3.5	270.6 ± 6.9	282.4 ± 6.7	280.7 ± 5.6	303.1 ± 8.2
Leafy[a]	39.2 ± 0.8	38.1 ± 1.5	37.1 ± 1.5	38.4 ± 1.2	45.3 ± 1.8
Exposed[b]	86.0 ± 1.5	88.5 ± 3.0	87.8 ± 2.9	76.9 ± 2.4	95.5 ± 3.6
Protected[c]	150.4 ± 2.3	137.2 ± 4.5	150.1 ± 4.3	160.1 ± 3.6	152.5 ± 5.3
Other	7.0 ± 0.3	6.9 ± 0.6	7.3 ± 0.5	5.4 ± 0.4	9.8 ± 0.7

[a] Produce belonging to this category include: cabbage, cauliflower, broccoli, celery, lettuce, and spinach.

[b] Produce belonging to this category include: apples, pears, berries, cucumber, squash, grapes, peaches, apricots, plums, prunes, string beans, pea pods, and tomatoes.

[c] Produce belonging to this category include: carrots, beets, turnips, parsnips, citrus fruits, sweet corn, legumes (peas, beans, etc.), melons, onion, and potatoes.

NOTE: Northeast = Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania.

North Central = Ohio, Illinois, Indiana, Wisconsin, Michigan, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

South = Maryland, Delaware, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Texas, and Oklahoma.

West = Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, Arizona, Nevada, Washington, Oregon, and California.

Source: U.S. EPA, 1984b (based on 1977-78 NFCS data).

Table 9-22.Mean and Standard Error for the Daily Intake of Food Subclasses Per Capita by Age (g/day as consumed)

Age (years)	Leafy produce[a]	Exposed produce[b]	Protected produce[c]	Other produce
All Ages	39.2 ± 0.8	86.0 ± 1.5	150.4 ± 2.3	7.0 ± 0.3
<1	3.2 ± 4.9	75.5 ± 9.8	50.8 ± 14.7	25.5 ± 1.8
1-4	9.1 ± 2.4	55.6 ± 4.8	94.5 ± 7.2	5.1 ± 0.9
5-9	20.1 ± 2.0	69.2 ± 4.8	128.9 ± 6.1	4.3 ± 0.8
10-14	26.1 ± 1.9	76.8 ± 3.8	151.7 ± 5.7	8.1 ± 0.7
15-19	31.4 ± 2.0	71.9 ± 4.0	156.6 ± 6.0	6.2 ± 0.7
20-24	35.3 ± 2.6	65.6 ± 5.2	144.5 ± 7.8	5.0 ± 1.0
25-29	41.4 ± 2.7	73.4 ± 5.3	149.8 ± 8.0	7.0 ± 1.0
30-39	44.4 ± 2.1	77.1 ± 4.2	150.5 ± 6.3	6.1 ± 0.8
40-59	51.3 ± 1.6	94.7 ± 3.3	162.9 ± 4.9	6.9 ± 0.6
≥ 60	45.4 ± 1.8	114.2 ± 3.6	163.9 ± 5.5	7.6 ± 0.7

[a] Produce belonging to this category include: cabbage, cauliflower, broccoli, celery, lettuce, and spinach.
[b] Produce belonging to this category include: apples, pears, berries, cucumber, squash, grapes, peaches, apricots, plums, prunes, string beans, pea pods, and tomatoes.
[c] Produce belonging to this category include: carrots, beets, turnips, parsnips, citrus fruits, sweet corn, legumes (peas, beans, etc.), melons, onion, and potatoes.
Source: U.S. EPA, 1984a (based on 1977-78 NFCS data).

Table 9-23. Consumption of Foods (g dry weight/day) for Different Age Groups and Estimated Lifetime Average Daily Food Intakes for a US Citizen (averaged across sex) Calculated from the FDA Diet Data

	Age (in years)						Estimated Lifetime Intake[a]
	(0-1)	(1-5)	(6-13)	(14-19)	(20-44)	(45-70)	
Potatoes	5.67	10.03	14.72	19.40	17.28	14.79	15.60
Leafy Veg.	0.84	0.49	0.85	1.22	2.16	2.65	1.97
Legume Veg.	3.81	4.56	6.51	8.45	9.81	9.50	8.75
Root Veg.	3.04	0.67	1.20	1.73	1.77	1.64	1.60
Garden fruits	0.66	1.67	2.57	3.47	4.75	4.86	4.15
Peanuts	0.34	2.21	2.56	2.91	2.43	1.91	2.25
Mushrooms	0.00	0.01	0.03	0.04	0.14	0.06	0.08
Veg. Oils	27.62	17.69	27.54	37.04	37.20	27.84	31.24

[a] The estimated lifetime dietary intakes were estimated by:

$$\text{Estimated lifetime} = \frac{IR(0\text{-}1) + 5\text{yrs} * IR(1\text{-}5) + 8\text{ yrs} * IR(6\text{-}13) + 6\text{ yrs} * IR(14\text{-}19) + 25\text{ yrs} * IR(20\text{-}44) + 25\text{ yrs} * IR(45\text{-}70)}{70\text{ years}}$$

where IR = the intake rate for a specific age group.
Source: U.S. EPA, 1989 (based on 1977-78 NFCS and NHANES II data).

Table 9-24. Mean Daily Intake of Foods (grams) Based on the Nutrition Canada Dietary Survey[a]

Age (yrs)	Sample Size	Fruit and Fruit Products	Vegetables Not Including Potatoes	Potatoes	Nuts and Legumes
Males and Females					
1-4	1031	258	56	75	6
5-11	1995	312	83	110	13
Males					
12-19	1070	237	94	185	20
20-39	999	244	155	189	15
40-64	1222	194	134	131	15
65+	881	165	118	124	8
Females					
12-19	1162	237	97	115	15
20-39	1347	204	134	99	8
40-64	1500	239	136	79	10
65+	818	208	103	80	5
Pregnant Females					
---	769	301	156	114	15

[a] Report does not specify whether means were calculated per capita or for consumers only. The reported values are consistent with the as consumed intake rates for consumers only reported by USDA (1980).

Source: Canadian Department of National Health and Welfare, n.d.

Table 9-25. Per Capita Consumption of Fresh Fruits and Vegetables in 1991[a]

Fresh Fruits		Fresh Vegetables	
Food Item	Per Capita Consumption (g/day)[b]	Food Item	Per Capita Consumption (g/day)[b]
Citrus		Artichokes	0.62
Oranges (includes Temple	10.2	Asparagus	0.75
oranges)	1.6	Snap Beans	1.4
Tangerines and Tangelos	3.1	Broccoli	3.5
Lemons	0.9	Brussel Sprouts	0.4
Limes	7.1	Cabbage	9.5
Grapefruit	22.9	Carrots	9.0
Total Fresh Citrus		Cauliflower	2.2
		Celery	7.8
Noncitrus	21.8	Sweet Corn	6.6
Apples	0.1	Cucumber	5.2
Apricots	1.7	Eggplant	0.5
Avocados	31.2	Escarole/Endive	0.3
Bananas	0.5	Garlic	1.6
Cherries	0.4	Head Lettuce	30.2
Cranberries	8.2	Onions	18.4
Grapes	0.5	Bell Peppers	5.8
Kiwi Fruit	1.0	Radishes	0.6
Mangoes	7.6	Spinach	0.9
Peaches & Nectarines	3.7	Tomatoes	16.3
Pears	2.2	Total Fresh Vegetables	126.1
Pineapple	0.3		
Papayas	1.7		
Plums and Prunes	4.1		
Strawberries	85.0		
Total Fresh Noncitrus	107.7		
Total Fresh Fruits			

[a] Based on retail-weight equivalent. Includes imports; excludes exports and foods grown in home gardens. Data for 1991 used.
[b] Original data were presented in lbs/yr; data were converted to g/day by multiplying by a factor of 454 g/lb and dividing by 365 days/yr.
Source: USDA, 1993.

Table 9-26. Quantity (as consumed) of Fruits and Vegetables Consumed Per Eating Occasion and the Percentage of Individuals Using These Foods in Three Days

Food category	% Indiv. using food in 3 days	Quantity consumed per eating occasion (g)		Consumers-only Quantity consumed per eating occasion at specified percentiles (g)[a]						
		Average	Standard Deviation	5	25	50	75	90	95	99
Raw vegetables										
White potatoes	74.4	125	90	29	63	105	170	235	280	426
Cabbage and coleslaw	9.7	68	45	15	40	60	90	120	120	240
Carrots	5	43	40	4	13	31	55	100	122	183
Cucumbers	5.6	80	76	8	24	70	110	158	220	316
Lettuce and tossed salad	50.7	65	59	10	20	55	93	140	186	270
Mature onions	8.5	31	33	3	17	18	36	57	72	180
Tomatoes	27.8	81	55	30	45	62	113	123	182	246
Cooked vegetables										
Broccoli	6.2	112	68	30	78	90	155	185	190	350
Cabbage	4.7	128	83	28	75	145	150	225	300	450
Carrots	9.8	70	59	19	46	75	92	150	155	276
Corn, whole kernel	23.9	95	56	21	65	83	123	170	170	330
Lima beans	2.8	110	75	21	67	88	170	175	219	350
Mixed vegetables	3.4	117	69	28	91	94	182	187	187	374
Cowpeas, field peas, black-eyed peas	2.9	131	88	22	88	88	175	196	350	350
Green peas	18.3	90	57	20	43	85	85	170	170	330
Spinach	4.5	121	70	24	78	103	185	205	205	380
String beans	27.3	86	54	18	67	70	135	140	140	280
Summer squash	2.8	145	98	27	105	108	215	215	352	430
Sweet potatoes	4.1	136	87	38	86	114	185	225	238	450
Tomato juice	3.9	91	122	91	122	182	243	243	363	486
Cucumber pickles	9.2	45	45	7	16	30	65	90	130	222
Fruits										
Grapefruit	4.7	159	58	106	134	134	165	268	268	330
Grapefruit juice	3.6	202	99	95	125	186	247	250	375	500
Oranges	9	146	57	73	145	145	145	180	228	360
Orange juice	35.5	190	84	95	125	187	249	249	311	498
Apples	18.2	141	49	69	138	138	138	212	212	276
Applesauce, cooked apples	9.8	134	86	28	64	128	130	255	155	488
Apple juice	3.8	191	101	63	124	186	248	248	372	496
Cantaloupe	3.3	171	91	61	136	136	272	272	272	529
Raw peaches	4.5	160	75	76	152	152	152	304	304	456
Raw pears	3.1	163	69	82	164	164	164	164	328	328
Raw strawberries	2.1	100	58	37	75	75	149	149	180	298

[a] Percentiles are cumulative; for example, 50 percent of people eat 105 g white potatoes per day or less.
Source: Pao et al., 1982 (based on 1977-78 NFCS data).

Table 9-27. Mean Moisture Content of Selected Fruits and Vegetables Expressed as Percentages of Edible Portions

Food	Moisture Content (Percent) Raw	Cooked	Comments
Fruit			
Apples - dried	31.76	84.13*	sulfured; *without added sugar
Apples -	83.93*	84.46**	*with skin; **without skin
Apples - juice		87.93	canned or bottled
Applesauce		88.35*	*unsweetened
Apricots	86.35	86.62*	*canned juice pack with skin
Apricots - dried	31.09	85.56*	sulfured; *without added sugar
Bananas	74.26		
Blackberries	85.64		
Blueberries	84.61	86.59*	*frozen unsweetened
Boysenberries	85.90		frozen unsweetened
Cantaloupes - unspecified	89.78		
Casabas	91.00		
Cherries - sweet	80.76	84.95*	*canned, juice pack
Crabapples	78.94		
Cranberries	86.54		
Cranberries - juice cocktail	85.00		bottled
Currants (red and white)	83.95		
Elderberries	79.80		
Grapefruit	90.89		
Grapefruit - juice	90.00	90.10*	*canned unsweetened
Grapefruit - unspecified	90.89		pink, red, white
Grapes - fresh	81.30		American type (slip skin)
Grapes - juice	84.12		canned or bottled
Grapes - raisins	15.42		seedless
Honeydew melons	89.66		
Kiwi fruit	83.05		
Kumquats	81.70		
Lemons - juice	90.73	92.46*	*canned or bottled
Lemons - peel	81.60		
Lemons - pulp	88.98		
Limes - juice	90.21	92.52*	*canned or bottled
Limes - unspecified	88.26		
Loganberries	84.61		
Mulberries	87.68		
Nectarines	86.28		
Oranges - unspecified	86.75		all varieties
Peaches	87.66	87.49*	*canned juice pack
Pears - dried	26.69	64.44*	sulfured; *without added sugar
Pears - fresh	83.81	86.47*	*canned juice pack
Pineapple	86.50	83.51*	*canned juice pack
Pineapple - juice		85.53	canned
Plums		85.20	
Quinces	83.80		
Raspberries	86.57		
Strawberries	91.57	89.97*	*frozen unsweetened
Tangerine - juice	88.90	87.00*	*canned sweetened
Tangerines	87.60	89.51*	*canned juice pack
Watermelon	91.51		
Vegetables			
Alfalfa sprouts	91.14		
Artichokes - globe & French	84.38	86.50	boiled, drained
Artichokes - Jerusalem	78.01		

Table 9-27. Mean Moisture Content of Selected Fruits and Vegetables Expressed as Percentages of Edible Portions (continued)

Food	Moisture Content (Percent) Raw	Cooked	Comments
Asparagus	92.25	92.04	boiled, drained
Bamboo shoots	91.00	95.92	boiled, drained
Beans - dry			
Beans - dry - blackeye peas (cowpeas)	66.80	71.80	boiled, drained
Beans - dry - hyacinth (mature seeds)	87.87	86.90	boiled, drained
Beans - dry - navy (pea)	79.15	76.02	boiled, drained
Beans - dry - pinto	81.30	93.39	boiled, drained
Beans - lima	70.24	67.17	boiled, drained
Beans - snap - Italian - green - yellow	90.27	89.22	boiled, drained
Beets	87.32	90.90	boiled, drained
Beets - tops (greens)	92.15	89.13	boiled, drained
Broccoli	90.69	90.20	boiled, drained
Brussel sprouts	86.00	87.32	boiled, drained
Cabbage - Chinese/celery, including bok choy	95.32	95.55	boiled, drained
Cabbage - red	91.55	93.60	boiled, drained
Cabbage - savoy	91.00	92.00	boiled, drained
Carrots	87.79	87.38	boiled, drained
Cassava (yucca blanca)	68.51		
Cauliflower	92.26	92.50	boiled, drained
Celeriac	88.00	92.30	boiled, drained
Celery	94.70	95.00	boiled, drained
Chili peppers	87.74	92.50*	*canned solids & liquid
Chives	92.00		
Cole slaw	81.50		
Collards	93.90	95.72	boiled, drained
Corn - sweet	75.96	69.57	boiled, drained
Cress - garden - field	89.40	92.50	boiled, drained
Cress - garden	89.40	92.50	boiled, drained
Cucumbers	96.05		
Dandelion - greens	85.60	89.80	boiled, drained
Eggplant	91.93	91.77	boiled, drained
Endive	93.79		
Garlic	58.58		
Kale	84.46	91.20	boiled, drained
Kohlrabi	91.00	90.30	boiled, drained
Lambsquarter	84.30	88.90	boiled, drained
Leeks	83.00	90.80	boiled, drained
Lentils - whole	67.34	68.70	stir-fried
Lettuce - iceberg	95.89		
Lettuce - romaine	94.91		
Mung beans (sprouts)	90.40	93.39	boiled, drained
Mushrooms	91.81	91.08	boiled, drained
Mustard greens	90.80	94.46	boiled, drained
Okra	89.58	89.91	boiled, drained
Onions	90.82	92.24	boiled, drained
Onions - dehydrated or dried	3.93		
Parsley	88.31		
Parsley roots	88.31		
Parsnips	79.53	77.72	boiled, drained
Peas (garden) - mature seeds - dry	88.89	88.91	boiled, drained
Peppers - sweet - garden	92.77	94.70	boiled, drained
Potatoes (white) - peeled	78.96	75.42	baked

Table 9-27. Mean Moisture Content of Selected Fruits and Vegetables Expressed as Percentages of Edible Portions (continued)

Food	Moisture Content (Percent)		Comments
	Raw	Cooked	
Potatoes (white) - whole	83.29	71.20	baked
Pumpkin	91.60	93.69	boiled, drained
Radishes - roots	94.84		
Rhubarb	93.61	67.79	frozen, cooked with added sugar
Rutabagas - unspecified	89.66	90.10	boiled, drained
Salsify (oyster plant)	77.00	81.00	boiled, drained
Shallots	79.80		
Soybeans - sprouted seeds	69.05	79.45	steamed
Spinach	91.58	91.21	boiled, drained
Squash - summer	93.68	93.70	all varieties; boiled, drained
Squash - winter	88.71	89.01	all varieties; baked
Sweetpotatoes (including yams)	72.84	71.85	baked in skin
Swiss chard	92.66	92.65	boiled, drained
Tapioca - pearl	10.99		dry
Taro - greens	85.66	92.15	steamed
Taro - root	70.64	63.80	
Tomatoes - juice		93.90	canned
Tomatoes - paste		74.06	canned
Tomatoes - puree		87.26	canned
Tomatoes - raw	93.95		
Tomatoes - whole	93.95	92.40	boiled, drained
Towelgourd	93.85	84.29	boiled, drained
Turnips - roots	91.87	93.60	boiled, drained
Turnips - tops	91.07	93.20	boiled, drained
Water chestnuts	73.46		
Yambean - tuber	89.15	87.93	boiled, drained

Source: USDA, 1979-1986.

Table 9-28. Summary of Fruit and Vegetable Intake Studies

Study	Survey Population Used in Calculating Intake	Types of Data Used	Units	Food Items
KEY STUDIES				
EPA Analysis of 1989-91 USDA CSFII data	Per capita data; consumer only data can be calculated	1989-91 CSFII data; Based on 3-day average individual intake rate	g/kg-day; as consumed	Major food groups; individual food items; exposed and protected fruits and vegetables; USDA food categories
RELEVANT STUDIES				
AIHC, 1994	Per Capita	Based on the 1977-78 USDA NFCS data provided in the 1989 version of the Exposure Factors Handbook.	g/day	Distributions for vegetables using @Risk software.
Canadian Department of National Health and Welfare, n.d.	Not known if per capita or consumers only	1970-72 survey based on 24-hour dietary recall	g/day; not known if as consumed	Fruit and fruit products, vegetables not including potatoes and nuts and legumes
EPA's DRES	Per capita (i.e., consumers and nonconsumers)	1977-78 NFCS 3-day individual intake data	g/kg-day; as consumed	Intake for a wide variety of fruits and vegetables presented; complex food groups were disaggregated
Pao et al., 1982	Consumers only serving size data provided	1977-78 NFCS 3-day individual intake data	g; as consumed	Serving sizes for only a limited number of products
USDA, 1980; 1992b; 1996a; 1996b	Per capita and consumer only	1977-78 and 1987-88 NFCS, and 1994 and 1995 CSFII 1-day individual intake data	g/day; as consumed	Total fruits and total vegetables
USDA, 1993	Per capita consumption based on "food disappearance"	Based on food supply and utilization data provided by the National Agricultural Statistics Service (NASS), Customs Service Reports, and trade associations	g/day; as consumed	Various food groups
U.S. EPA/ORP, 1984a; 1984b	Per capita	1977-78 NFCS Individual intake data	g/day; as consumed	Exposed, protected, and leafy produce
U.S. EPA/OST, 1989	Estimated lifetime dietary intake	Based on FDA Total Diet Study Food List which used 1977-78 NFCS data, and NHANES II data	g/day; dry weight	Various food groups; complex foods disaggregated

Table 9-29. Summary of Recommended Values for Per Capita Intake of Fruits and Vegetables

Mean	95th Percentile	Multiple Percentiles	Study
Total Fruit Intake			
3.4 g/kg-day	12 g/kg-day	see Table 9-3	EPA Analysis of CSFII 1989-91 Data
Total Vegetable Intake			
4.3 g/kg-day	10 g/kg-day	see Table 9-4	EPA Analysis of CSFII 1989-91 Data
Individual Fruit and Vegetables Intake			
see Table 9-5	---	---	EPA Analysis of CSFII 1989-91 Data

Table 9-30. Confidence in Fruit and Vegetable Intake Recommendations

Considerations	Rationale	Rating
Study Elements		
• Level of peer review	USDA CSFII survey receives high level of peer review. EPA analysis of these data has been peer reviewed outside the Agency.	High
• Accessibility	CSFII data are publicly available.	High
• Reproducibility	Enough information is included to reproduce results.	High
• Focus on factor of interest	Analysis is specifically designed to address food intake.	High
• Data pertinent to U.S.	Data focuses on the U.S. population.	High
• Primary data	This is new analysis of primary data.	High
• Currency	Were the most current data publicly available at the time the analysis was conducted for the Handbook.	High
• Adequacy of data collection period	Survey is designed to collect short-term data.	Medium confidence for average values; Low confidence for long term percentile distribution
• Validity of approach	Survey methodology was adequate.	High
• Study size	Study size was very large and therefore adequate.	High
• Representativeness of the population	The population studied was the U.S. population.	High
• Characterization of variability	Survey was not designed to capture long term day-to-day variability. Short term distributions are provided.	Medium
• Lack of bias in study design (high rating is desirable)	Response rate was adequate.	Medium
• Measurement error	No measurements were taken. The study relied on survey data.	N/A
Other Elements		
• Number of studies	1; CSFII 1989-91 was the most recent data set publicly available at the time the analysis was conducted for the Handbook. Therefore, it was the only study classified as key study.	Low
• Agreement between researchers	Although the CSFII was the only study classified as key study, the results are in good agreement with earlier data.	High
Overall Rating	The survey is representative of U.S. population. Although there was only one study considered key, these data are the most recent and are in agreement with earlier data. The approach used to analyzed the data was adequate. However, due to the limitations of the survey design estimation of long-term percentile values (especially the upper percentiles) is uncertain.	High confidence in the average; Low confidence in the long-term upper percentiles

Table 9A-1. Fraction of Grain and Meat Mixture Intake Represented by Various Food Items/Groups	
Grain Mixtures	
total vegetables	0.2360
tomatoes	0.1685
white potatoes	0.0000
total meats	0.0787
beef	0.0449
pork	0.0112
poultry	0.0112
dairy	0.1348
total grains	0.3146
Meat Mixtures	
total vegetables	0.2778
tomatoes	0.1111
white potatoes	0.0333
total meats	0.3556
beef	0.2000
pork	0.0222
poultry	0.0778
dairy	0.0556
total grains	0.1333

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data

Food Product	Food Codes	
MAJOR FOOD GROUPS		
Total Fruits	6- Fruits citrus fruits and juices dried fruits other fruits fruits/juices & nectar fruit/juices baby food	(includes baby foods)
Total Vegetables	7- Vegetables (all forms) white potatoes & PR starchy dark green vegetables deep yellow vegetables tomatoes and tom. mixtures other vegetables veg. and mixtures/baby food veg. with meat mixtures	411- Beans/legumes 412- Beans/legumes 413- Beans/legumes (includes baby foods; mixtures, mostly vegetables; does not include nuts and seeds)
Total Meats	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	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)
INDIVIDUAL FOODS		
White Potatoes	71- White Potatoes and PR 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	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 7551105 Peppers, hot pickled (does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Onions	7510950 Chives, raw 7511150 Garlic, raw 7511250 Leek, raw 7511701 Onions, young green, raw 7511702 Onions, mature 7521550 Chives, dried 7521740 Garlic, cooked 7521840 Leek, 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)

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)

Food Product	Food Codes	
Corn	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	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 6210130 Apple chips 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 6410409 Apple juice with calcium 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)
Tomatoes	74- Tomatoes and Tomato Mixtures raw, cooked, juices, sauces, mixtures, soups, sandwiches	
Snap Beans	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	21- Beef beef, nfs beef steak beef oxtails, neckbones, 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)

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)

Food Product	Food Codes	
Pork	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	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	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	3- Eggs eggs egg mixtures egg substitutes eggs baby food froz. meals with egg as main ingred.	(includes baby foods)
Broccoli	722- Broccoli (all forms)	(does not include vegetable soups; vegetable mixtures; or vegetable with meat mixtures)
Carrots	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	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)
Asparagus	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	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	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)

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)		
Food Product	**Food Codes**	
Lettuce	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	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)
Peas	7512000 Peas, green, raw 7512775 Snowpeas, raw 75223- Peas, cowpeas, field or blackeye, 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	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	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	6322- Strawberries 6413250 Strawberry Juice	(includes baby food; except mixtures)
Other Berries	6320- Other Berries 6321- Other Berries 6341101 Cranberry salad	6410460 Blackberry Juice 64105- Cranberry Juice (includes baby food; except mixtures)
Peaches	62116- Dried Peaches 63135- Peaches 6412203 Peach Juice 6420501 Peach Nectar	67108- Peaches ,baby 6711450 Peaches, dry, baby (includes baby food; except mixtures)
Pears	62119- Dried Pears 63137- Pears 6341201 Pear salad 6421501 Pear Nectar	67109- Pears, baby 6711455 Pears, dry, baby 6721200 Pear juice, baby (includes baby food; except mixtures)

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)		
Food Product	**Food Codes**	
EXPOSED/PROTECTED FRUITS/VEGETABLES, ROOT VEGETABLES		
Exposed Fruits	621011- Apple, dried 621012- Apple, dried 6210130 Apple chips 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 6410409 Apple juice with calcium 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 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	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 64125- Pineapple juice 64133- Watermelon Juice 6420150 Banana Nectar 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)

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)

Food Product	Food Codes			
Exposed Veg.	721-	Dark Green Leafy Veg.	752167-	Cucumber, cooked
	722-	Dark Green Nonleafy Veg.	752170-	Eggplant, cooked
	74-	Tomatoes and Tomato Mixtures	752171-	Fern shoots
	7510050	Alfalfa Sprouts	752172-	Fern shoots
	7510075	Artichoke, Jerusalem, raw	752173-	Flowers of sesbania, squash or lily
	7510080	Asparagus, raw	7521801	Kohlrabi, cooked
	75101-	Beans, sprouts and green, raw	75219-	Mushrooms, cooked
	7510260	Broccoflower, raw	75220-	Okra/lettuce, cooked
	7510275	Brussel Sprouts, raw	7522116	Palm Hearts, cooked
	7510280	Buckwheat Sprouts, raw	7522121	Parsley, cooked
	7510300	Cabbage, raw	75226-	Peppers, pimento, cooked
	7510400	Cabbage, Chinese, raw	75230-	Sauerkraut, cooked/canned
	7510500	Cabbage, Red, raw	75231-	Snowpeas, cooked
	7510700	Cauliflower, raw	75232-	Seaweed
	7510900	Celery, raw	75233-	Summer Squash
	7510950	Chives, raw	7540050	Artichokes, stuffed
	7511100	Cucumber, raw	7540101	Asparagus, creamed or with cheese
	7511120	Eggplant, raw	75403-	Beans, green with sauce
	7511200	Kohlrabi, raw	75404-	Beans, yellow with sauce
	75113-	Lettuce, raw	7540601	Brussel Sprouts, creamed
	7511500	Mushrooms, raw	7540701	Cabbage, creamed
	7511900	Parsley	75409-	Cauliflower, creamed
	7512100	Pepper, hot chili	75410-	Celery/Chiles, creamed
	75122-	Peppers, raw	75412-	Eggplant, fried, with sauce, etc.
	7512750	Seaweed, raw	75413-	Kohlrabi, creamed
	7512775	Snowpeas, raw	75414-	Mushrooms, Okra, fried, stuffed, creamed
	75128-	Summer Squash, raw	754180-	Squash, baked, fried, creamed, etc.
	7513210	Celery Juice	7541822	Christophine, creamed
	7514100	Cabbage or cole slaw	7550011	Beans, pickled
	7514130	Chinese Cabbage Salad	7550051	Celery, pickled
	7514150	Celery with cheese	7550201	Cauliflower, pickled
	75142-	Cucumber salads	755025-	Cabbage, pickled
	75143-	Lettuce salads	7550301	Cucumber pickles, dill
	7514410	Lettuce, wilted with bacon dressing	7550302	Cucumber pickles, relish
	7514600	Greek salad	7550303	Cucumber pickles, sour
	7514700	Spinach salad	7550304	Cucumber pickles, sweet
	7520060	Algae, dried	7550305	Cucumber pickles, fresh
	75201-	Artichoke, cooked	7550307	Cucumber, Kim Chee
	75202-	Asparagus, cooked	7550308	Eggplant, pickled
	75203-	Bamboo shoots, cooked	7550311	Cucumber pickles, dill, reduced salt
	752049-	Beans, string, cooked	7550314	Cucumber pickles, sweet, reduced salt
	75205-	Beans, green, cooked/canned	7550500	Mushrooms, pickled
	75206-	Beans, yellow, cooked/canned	7550700	Okra, pickled
	75207-	Bean Sprouts, cooked	75510-	Olives
	752085-	Breadfruit	7551101	Peppers, hot
	752087-	Broccoflower, cooked	7551102	Peppers,pickled
	752090-	Brussel Sprouts, cooked	7551104	Peppers, hot pickled
	75210-	Cabbage, Chinese, cooked	7551301	Seaweed, pickled
	75211-	Cabbage, green, cooked	7553500	Zucchini, pickled
	75212-	Cabbage, red, cooked	76102-	Dark Green Veg., baby
	752130-	Cabbage, savoy, cooked	76401-	Beans, baby (excl. most soups & mixtures)
	75214-	Cauliflower	411-	Beans/legumes
	75215-	Celery, Chives, Christophine (chayote)	412-	Beans/legumes
			413-	Beans/legumes

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)

Food Product	Food Codes	
Protected Veg.	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 blackeye, 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)
Root Vegetables	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 7521840 Leek, cooked 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	72- Dark Green Vegetables all forms leafy, nonleafy, dk. gr. veg. soups	
Deep Yellow Vegetables	73- Deep Yellow Vegetables all forms carrots, pumpkin, squash, sweetpotatoes, dp. yell. veg. soups	
Other Vegetables	75- Other Vegetables all forms	
Citrus 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)

Appendix 9B. Food Codes and Definitions Used in Analysis of the 1989-91 USDA CSFII Data (continued)				
Food Product	**Food Codes**			
Other Fruits	62-	Dried Fruits	67204-	Baby Juices
	63-	Other Fruits	67212-	Baby Juices
	64-	Fruit Juices and Nectars Excluding Citrus	67213-	Baby Juices
	671-	Fruits, baby	6725-	Baby Juice
	67202-	Apple Juice, baby	673-	Baby Fruits
	67203-	Baby Juices	674-	Baby Fruits
MIXTURES				
Meat Mixtures	27-	Meat Mixtures	(includes frozen plate meals and soups)	
	28-			
Grain Mixtures	58-	Grain Mixtures	(includes frozen plate meals and soups)	

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DOWNLOADABLE TABLES FOR CHAPTER 9

The following selected tables are available for download as Lotus 1-2-3 worksheets.

Table 9-3. Per Capita Intake of Total Fruits (g/kg-day as consumed) [WK1, 6 kb]

Table 9-4. Per Capita Intake of Total Vegetables (g/kg-day as consumed) [WK1, 6 kb]

Table 9-5. Per Capita Intake of Individual Fruits and Vegetables (g/kg-day as consumed) [WK1, 31 kb]

Table 9-6. Per Capita Intake of USDA Categories of Fruits and Vegetables (g/kg-day as consumed) [WK1, 9 kb]

Table 9-7. Per Capita Intake of Exposed Fruits (g/kg-day as consumed) [WK1, 7 kb]

Table 9-8. Per Capita Intake of Protected Fruits (g/kg-day as consumed) [WK1, 7 kb]

Table 9-9. Per Capita Intake of Exposed Vegetables (g/kg-day as consumed) [WK1, 7 kb]

Table 9-10. Per Capita Intake of Protected Vegetables (g/kg-day as consumed) [WK1, 7 kb]

Table 9-11. Per Capita Intake of Root Vegetables (g/kg-day as consumed) [WK1, 7 kb]

Table 9-26. Quantity (as consumed) of Fruits and Vegetables Consumed Per Eating Occasion and the Percentage of Individuals Using These Foods in Three Days [WK1, 6 kb]