

Food Consumption and Nutrient Intakes

Documentation: 2007–10 Data Files

ERS provides data on food consumption and nutrient intake by food source and demographic characteristics:

- Three tables provide estimates of food consumption in 2007–10.
- Two tables provide estimates of nutrient intake in 2007–10.

About Our Estimates

The National Health and Nutrition Examination Survey (NHANES) measures foods actually eaten by individuals. Since 2003, NHANES has recorded food intake over 2 nonconsecutive days using 24-hour dietary recalls to obtain information about what people eat. Survey respondents also reported where food was purchased and where it was eaten.

NHANES collects demographic information, such as household income, race and ethnicity, age, and sex, along with a variety of health data, through household interviews and medical examinations conducted in-person at mobile examination centers. This information makes the data particularly valuable for linking diet and eating habits to health outcomes such as obesity, diabetes, and hypertension. The NHANES data provide background information useful in policy formation, regulation, program planning and evaluation, as well as education and research.

Food consumption estimates

Food consumption data from NHANES were combined with USDA's Food Pattern Equivalents Database (FPED, formerly known as MyPyramid Equivalents Database) to estimate food consumption by food groups as specified in the 2010 [Dietary Guidelines for Americans](#). For example, a respondent in NHANES may report having eaten a specific amount of apple pie; such data are then translated into cups of fruit, ounces of grain, grams of oils and solid fat, and teaspoons of added sugars.

Data on where food is obtained are used to divide food into 2 categories—at-home and away-from-home food.

- Food at home is generally obtained at a retail store such as a supermarket, grocery store, or convenience store.
- Food away from home is generally purchased from foodservice establishments, such as full-service restaurants with wait staff, fast food restaurants with limited menus and no wait staff, and carryout places. Food away from home can also be obtained from school cafeterias, day care centers, and summer camps for children age 2–19 as well as from other community food programs.

Food consumption in terms of the *Dietary Guidelines for Americans'* groups is reported for all sources, as well as by food source for the total U.S. population (non-pregnant/non-lactating individuals age 2 and older), children age 2–19, adults age 20 and older, lower-income individuals (household income at or below 185 percent of the poverty line), and higher-income individuals (household income above 185 percent of the poverty line).

In food consumption table 1, the average daily intake by food groups in 2007–10 is reported. By comparing food consumption data with calorie intake data (reported in nutrient table 1), food consumption can be expressed in terms of density—the amount of food for each 1,000 calories contained in an American diet. This density measurement is used in USDA's calculation of the Healthy Eating Index. By comparing food consumption density with the benchmark density (a ratio of the recommended consumption amount to calorie intake, as specified in the *Dietary Guidelines for Americans*), insight can be gained about shortfalls in American diets relative to the dietary guidelines. Comparing food consumption density by food source yields a better understanding of the source of American dietary shortfalls. Food consumption density for children, adults, and lower- and higher-income individuals, as well as density by food source, is reported in food consumption table 2. The benchmark food density is presented in food consumption table 3.

Either the mean or the ratio approach could be used to estimate food and nutrient density (see Freedman, L., P. Guenther, S. Krebs-Smith, and P. Kott, "A Population's Mean Healthy Eating Index—2005 Scores Are Best Estimated by the Score of the Population Ratio When One 24-Hour Recall is Available," *The Journal of Nutrition* 138(9):1725-29, 2008). ERS used the ratio approach for these estimates. For example, to estimate calcium density at home, ERS first calculated the weighted sum of total calories and total calcium at home, and then took the ratio of the two sums to represent the calcium density for at-home food.

The mean and ratio approaches often yield similar results, although they may sometimes produce different (but equally valid) results (see Krebs-Smith, S.M., P.S. Kott, and P.M. Guenther, "Mean Proportion and Population Proportion: Two Answers to the Same Question?" *Journal of the American Dietetic Association* 89(5):671-76, 1989). Because certain foods and beverages, such as tap water and diet beverages, have no calories but contain certain amounts of other nutrients (such as sodium or calcium), the ratio approach eliminates the occurrence of outliers that were generated by the mean approach.

Nutrient intake estimates

Studies have shown that Americans tend to over-consume fats, sodium, and cholesterol but under-consume calcium, fiber, and iron. Using USDA's nutrient database, food consumption data in NHANES were converted to nutrient consumption data. Average (mean) daily intakes of these nutrients for the total U.S. population, children age 2–19, adults age 20 and older, lower-income individuals, and higher-income individuals are reported by food source in nutrient table 1. Nutrient intake can be expressed in terms of

density by the ratio of nutrient intake to calorie intake; the result can then be compared with the dietary recommendations.

Mean nutrient intakes are reported by food source in nutrient table 1 and by nutrient density in table 2, providing insight about sources of over- and under-consumption of various nutrients. For example, foods rich in calcium are essential for children's development. According to nutrient table 2, the mean calcium intake for children age 2–19 is 543 milligrams per 1,000 calories. Calcium intake by source shows that, for each 1,000 calories, children consume 568 milligrams of calcium at home, lower than the amount consumed at school (709 milligrams) but higher than the amount consumed at restaurants (410 milligrams) and fast food places (403 milligrams). The increased popularity of eating away from home—at restaurants and fast food places—is associated with a deficiency in calcium intake.