Documentation for the Pyramid Servings Database for NHANES III

How Serving Values Were Assigned

There are 4542 different codes representing all foods reported in the Third National Health and Nutrition Survey (NHANES III) by persons age two and older who supplied complete and reliable 24-hour recalls. These foods were initially assigned codes using the 994-96 Continuing Survey of Food Intakes by Individuals (CSFII) food code database, except that the NHANES III codes have seven digits, while the CSFII codes have eight. The last digit of the CSFII code provides further specificity about the food, such as the processing form. It is most often a zero, indicating no further specificity, except in the case of vegetables where fresh, canned, or frozen is usually specified.

Of the 4542 food codes in the NHANES III, 3741 are identical to the first seven digits of only a single code used in the CSFII, giving a one-to-one correspondence. These codes were directly matched to codes in the CSFII Pyramid Servings Database (PSDB) (U.S. Department of Agriculture, Agricultural Research Service. 1998. 1994-96 Continuing Survey of Food Intakes by Individuals and 1994-96 Diet and Health Knowledge Survey. CD-ROM. Available through National Technical Information Service, Accession Number PB98-500457.)

Pyramid servings per 100 gm were assigned for the remaining 801 codes, included in the NHANES III subset database, using the following protocol:

- Link directly to a code in the CSFII PSDB for a food that is nearly identical. For example, "corned beef sandwich" was ascribed servings with values identical to "roast beef sandwich." This approach was taken for 690 NHANES III codes: 127 matched the first seven digits of two or more CSFII codes, so the best match was selected; 19 others matched the first seven digits of a CSFII code that had a "modification", and the best-fit modification was chosen. The rest were linked using the following guidelines:

    - Chocolate flavor = non-chocolate flavor
    - Lean and fat eaten = not specified (NS) as to fat
    - Skin eaten = NS as to skin
    - Chicken, boneless, NS as to part = breast
    - Smoked fish (type specified) = fish, smoked, NS as to type
    - Shellfish, steamed = canned
    - Lamb/mutton or game mixture = beef mixture
    - Low/reduced sodium = regular
    - Toasted = not toasted
    - Uncooked, non-whole grain, e.g., cornmeal, farina = white flour
    - Wheat bran bread product = wheat/cracked wheat
    - For ready-to-eat cereals, use best matches on total fat, fiber, and sucrose
    - Dried fruit (any type) = prunes
    - Canned fruit NS as to sweetener = heavy syrup
    - With peel = without peel for potatoes
    - Pickled vegetables (type specified) = pickled beets

- Soup, cream of, made with milk/water = NS as to milk/water
- Baby strained vegetables = baby junior vegetables
- Calcium-fortified = not calcium fortified
- Vitamin C added = no vitamin C added

- Link, with minor modifications, to a code in the CSFII PSDB for a food that is similar. For example, “macaroni salad with chicken” was ascribed servings values identical to “macaroni salad with tuna,” except that values for fish were changed to those for poultry. This approach was taken for 68 NHANES III codes.

- Develop food code composites to represent mixtures for which sufficiently similar foods are not found in the CSFII database. For example, frozen meals which did not match any single code in the CSFII PSDB were ascribed servings based on a composite of codes for each of the components of the frozen meal. This was done for 25 codes, using the CSFII recipe database.

- Assume all servings to be zero. The remaining 18 of the food codes represented spices or herbs, so zero was assigned as the number of servings from all food groups.

For many of these decisions, the following resources were consulted:

- CSFII recipe database
- USDA Nutrient Database for Standard Reference, Release 12
- Cookbooks
- Internet resources
- For ready-to-eat cereals reported in NHANES III, University of Minnesota’s Nutrition Data System codes and nutrient values were used to find the best matches using total fat, fiber and sucrose content. These nutrients were used to ascertain the best matches on the basis of discretionary fat, whole grain and added sugar, respectively.

Pyramid servings for the NHANES III codes are provided in two different databases. The complete database, containing all 4542 foods, is in a tabular format for easier examination of the pyramid servings for all foods reported. The NHANES III subset database contains only the 801 codes in NHANES III without one-to-one matches in CSFII. This database uses the multiple-records-per-food-code format that corresponds to the CSFII Pyramid Servings Database (PSDB). The following table shows the various treatments of the NHANES III codes, the number of codes assigned to each, and database containing those codes.

Assigning Pyramid Servings to NHANES III Food Codes		
Number of codes	**Treatment**	**Found in Complete/Subset Database**
3741	One-to-one match to CSFII PSDB code	Complete only
690	Link to near-identical CSFII PSDB code	Complete and subset
68	Link to similar CSFII PSDB code	Complete and subset
25	Composite developed	Complete and subset
18	Zero servings assigned	Complete and subset
Total: 4542		

Other Systems for Assessing Food Group Intakes in Both the NHANES and CSFII Surveys
Other groups have assigned numbers of servings from the Food Guide Pyramid's major groups to foods reported in the CSFII and NHANES surveys, most notably for the purposes of deriving The USDA Healthy Eating Index. The Healthy Eating Index (HEI) is the sum of 10 component scores, five of which represent the degree to which a person's intake meets the recommended intake of grains, vegetables, fruits, meat/meat alternates, and milk products. While the same guiding principles were used in deriving the food group estimates for the HEI as for the development of this database, there are some differences due to the use of slightly different assumptions and methods. One feature of both this database and the PSDB on which it was based, that sets them apart from the methods used to determine the HEI, is the inclusion of minor food groups (e.g., whole grain servings and non-whole grain servings as well as total grains) and of teaspoons of added sugars and grams of discretionary fat. A copy of the diskette containing NHANES HEI data can be obtained through the NHANES Program at the Center for Health Statistics, (301) 458-4567.

Estimated mean servings for all food groups--for all persons over two years, and for males and females separately, 20 years and older--derived using the 1988-94 NHANES III are very close to those for comparable sex-age groups using the 1994-96 CSFII. The largest differences were in the meat group, for which estimates were slightly greater using NHANES III (but by less than ½ ounce per person per day.)

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