

Section 5. Issues to Consider When Using the Pyramid Servings Data

5.1. Comparing food intakes to Pyramid recommendations

The Food Guide Pyramid includes a recommended range of servings for each major food group as follows:

- C 6 to 11 servings from the grain group
- C 3 to 5 servings from the vegetable group
- C 2 to 4 servings from the fruit group
- C 2 to 3 servings from the dairy (milk) group
- C 5 to 7 ounces of cooked lean meat equivalents from the meat group

The recommendation for any given person for the grain, vegetable, fruit, and meat groups depends on their energy need, which is determined by age, sex, body size, and level of physical activity (USDA 1992, USDA/CNPP 1999). The recommendation for the dairy group depends on age (USDA and USDHHS 2000).

The Pyramid provides a general guide for healthful eating. It is not intended to define rigidly how many servings from each food group a given individual should consume each day. Rather the recommendations are meant to be achieved over time. Different combinations of servings from each food group can provide the nutrients people need in appropriate amounts.

The Food Guide Pyramid provides sample diets at three calorie levels for people to use as general guides about the number of servings to consume from the five major food groups to meet energy needs (see Table 6). The sample diets also provide guidance on appropriate amounts of total fat and total sugars at each calorie level (Cronin et al. 1985). In 1999, specific serving recommendations for children 2 through 6 years of age were issued; the number of servings from each group is the same as the numbers at the lower end of the recommended ranges; very young children (2-3 years old) can have smaller servings (1/3 less) than standard (USDA/CNPP 1999; Davis et al. 1999).

The criteria used to update the Pyramid Servings Database for USDA Survey Food Codes were the same criteria used to develop previous releases of the Pyramid Servings databases for CSFII 1994 and CSFII 1994-96 (USDA/ARS 1997, 1998). However, while the databases are comparable, reported intakes of Pyramid Servings Intakes using these databases will vary. The summary tables on Pyramid Servings Intakes by U.S. Children and Adults, 1994-96, 1998 (USDA/ARS 2000b) replace results previously released. These CSFII 1994-96, 1998 Pyramid Servings tables are accessible online through CNRG's Web site.

Changes in the newest release of Pyramid Servings intakes compared to previous releases include:

- C changes in the serving recommendation for the dairy group by specific age ranges and physiological state (USDA and USDHHS 2000);
- C application of new serving recommendations for young children, 2 to 6 years old (Davis et al. 1999; USDA/CNPP 1999)
- C use of additional data on children, 2 to 9 years of age from CSFII 1998;
- C greater flexibility for reporting serving contributions of dry beans and peas in either the meat and bean group or in the vegetable group (See section 5.2)

Table 6. Sample Diets for a Day at 3 Calorie Levels for Individuals 7 years and over ⁺

Food group	1,600 calories	2,200 calories	2,800 calories
Grain group servings	6	9	11
Vegetable group servings	3	4	5
Fruit group servings	2	3	4
Dairy group servings	2 or 3*	2 or 3*	2 or 3*
Meat and bean group (ounces)**	5	6	7
Total fat (grams)	53	73	93
Total added sugars (teaspoons)	6	12	18

⁺ The recommendations for children 2 through 6 years of age are dependent on age alone; the number of servings is the same as those recommended for the 1,600 calorie diet; for very young children (2-3 years of age), the serving size should be 2/3 the standard size for all Pyramid groups except dairy.

* According to the Pyramid, older children and teenagers (9 through 18 years of age) and adults over the age of 50 need 3 servings daily. Others need 2 servings daily. During pregnancy and lactation, the recommended number of dairy group servings is the same as for nonpregnant women.

** Meat group amounts are in ounces of cooked lean meat.. Amounts of meat alternates that count as one ounce equivalence of cooked lean meat are one egg, 1/2 cup of cooked dry beans or peas, 1/2 cup tofu, two tablespoons of peanut butter, 1/3 cup of nuts, and 1/4 cup of seeds.

Users of the data files on Pyramid Servings with food intakes coded to CSFII food codes may choose to interpret this general guidance in different ways when comparing food intakes to recommendations. For example, the Pyramid Servings Intake tables (USDA/ARS 2000b) operationalized the guidance in Table 6 as follows:

C Grain, vegetable, and fruit groups:

For individuals, over 6 years old, with energy intakes equal to or greater than 2,800 calories, the numbers of servings per day consumed from each food group were compared to those in the sample diet at 2,800 calories (i.e., top of recommended range).

For individuals, over 6 years old, with energy intakes of less than 2,800 calories but at least 2,200 calories, the number of servings consumed were compared to those in the sample diet at 2,200 calories (i.e., the middle of recommended range).

For individuals, over 6 years old, with energy intakes of less than 2,200 calories, the number of servings consumed were compared to those in the sample diet at 1,600 calories (i.e., bottom of recommended range).

For children 2 through 6 years old, the numbers of servings consumed were compared to the specific recommendations for their age (USDA/CNPP 1999).

Serving sizes for very young children (2 through 3 years old) were reduced as described in section 5.3 "Serving sizes for young children" to adjust for smaller serving sizes allowed by the Pyramid for that population group.

See also section 5.2 for a discussion on using and reporting servings of dry beans and peas.

C Meat and beans group:

For individuals, over 6 years old, with energy intakes equal to or greater than 2,800 calories, the ounces of cooked lean meat equivalents consumed per day were compared to those in the sample diet at 2,800 calories, which is 7 ounces.

For individuals, over 6 years old, with energy intakes of less than 2,800 calories but at least 2,200 calories, the ounces of cooked lean meat equivalents consumed were compared to those in the sample diet at 2,200 calories, which is 6 ounces.

For individuals, over 6 years old, with energy intakes of less than 2,200 calories, the ounces of cooked lean meat equivalents consumed per day were compared to those in the sample diet at 1,600 calories, which is 5 ounces.

For children 4 through 6 years old, the ounces of cooked lean meat equivalents consumed per day were compared to the recommendations for their age which is 5 ounces (USDA/CNPP 1999).

For very young children (2 to 3 years), the ounces of cooked lean meat equivalents consumed per day were compared to the recommendations for their age which is 3.3 ounces (5 ounces x 2/3 to account for smaller serving sizes allowed by the Pyramid for that population group; see section 5.3 "Serving Sizes for Young Children").

See also section 5.2 for a discussion on using and reporting servings of dry beans and peas.

- C Dairy group: According to the Pyramid, the recommendation is that all individuals consume 2 to 3 dairy servings per day. Older children and teenagers (9 through 18 years of age) and adults over the age of 50 need 3 servings daily. Others need 2 servings daily. During pregnancy and lactation, the recommended number of dairy group servings is now the same as for nonpregnant women (USDA and USDHHS 2000).

This recommendation is more recent and replaces the recommendation previously used to report Pyramid Servings from the dairy group (USDA/ARS 1997, 1998). Previous recommendations for the dairy group were specific for teenagers and young adults to age 24 and physiological status (pregnant and lactating). *CAUTION* is required that these new guidelines be applied when analyzing intakes in terms of Pyramid Servings, and not the older guideline for dairy servings.

5.2. Dry beans and peas . . . meat alternates or vegetables?

Cooked dry beans and peas can be counted as either a meat alternate or a vegetable according to the Pyramid (USDA 1992). The serving size for cooked dry beans and peas is defined as 1/2 cup; this amount is equivalent to one ounce of cooked lean meat or counts as a vegetable serving. Since the units of measure for servings of dry beans and peas are comparable, whether counted toward the meat or vegetable group, data in these files can be tabulated with either group, depending on the research objectives.

In the CSFII 1994-96 summary tables for Pyramid Servings (USDA/ARS 1998) dry beans and peas were counted as vegetables. However, in the CSFII 1994-96, 1998 summary intake tables for Pyramid servings (USDA/ARS 2000b) cooked dried beans and peas are counted as meat alternates. This change was made since the Pyramid group for the Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group was also identified as the Meat and Beans Group (USDA and USDHHS 2000).

See Section 6.2 for programming guidance on assigning the variable for dry beans and peas (LEGUMES) to a Pyramid group.

5.3. Serving sizes for young children

The Pyramid recommends that young children (2 through 6 years old) consume the same number of servings as those at the low end of the range recommended for the general population, i.e.,

6 servings of grains	2 servings of milk, yogurt, cheese
3 servings of vegetables	5 ounces meat or meat alternates
2 servings of fruit	

The recommendations also state that very young children, (2 through 3 years old), consume smaller servings ($2/3$ the standard serving sizes) from the grain, vegetable, fruit, and meat groups (USDA/CNPP 1999). The rationale given is that young children need the same variety of foods as other people even though their calorie needs may be relatively low. All children 2 to 6 years of age should consume two standard servings from the dairy group each day. These recommended quantities of food meet most of the nutrient needs for 4 to 6 year old children through a 1,600 calorie meal pattern, and for younger children, 2 through 3 years old, through a 1,300 calorie meal pattern (Davis et al. 1999).

The Pyramid Servings data files represent the number of standard servings from each Pyramid group in 100 grams of food. This data can be used to generate Servings intake data (see Section 6.1). Prior to analysis of food intakes in terms of Pyramid servings, ARS suggests that an adjustment be made regarding the number of servings consumed from the grain, vegetable, and fruit groups for very young children (2 to 3 years old; see Section 6.2). Further adjustments can be made based on study objectives.

Children's data in the summary tables on Pyramid Servings Intakes for U.S. Children and Adults, 1994-96, and 1998 (USDA/ARS 2000b) were adjusted as described below:

- C For the grain, vegetable, and fruit groups, one standard serving in the Pyramid Intake data counted as 1.5 servings (i.e., one divided by $2/3 = 1-1/2$) for very young children (2 to 3 years of age)
- C For the meat group, the Pyramid recommendation and the amount consumed are expressed in ounces, not servings. Since it is not appropriate to adjust the ounces consumed, the number of ounces of lean meat equivalents consumed by very young children (2 to 3 years of age) is compared to the recommendation, i.e., 3.3 ounces of cooked lean meat equivalents per day ($5 \times 2/3 = 3.3$).
- C No adjustments were made for the dairy group; young children should consume the equivalent of two cups of milk a day.

5.4. Statistical issues

Before using the servings intake data file for analyses and reports, it is important to understand statistical issues related to the Servings intake data and the CSFII 1994-96, 1998 sample design and weights. This section highlights information on:

- C CSFII variables incorporated into the Pyramid Servings Intake files
- C Characteristics and limits of CSFII variables used with servings data
- C Issues related to sample designs and weights

The CNRG Pyramid Servings Database for USDA Survey Food Codes includes SAS® programs (SAS 1990) to create two SAS® Servings intake data files: record type 32 (rt32.ssd) with individual food level Pyramid Servings intake, and record type 42 (rt42.ssd) with daily Pyramid Servings intake. Each file contains data in both numeric and alphanumeric form. (See section 6.1 for the instructions for creating the rt32.ssd and rt42.ssd files.)

Key fields for more than 30 variables are included in rt32 and rt42. They contain identifiers such as the household identification number and the sample person number, demographic data such as region and urbanization, household data such as income and household size, personal data such as age and race, and sampling data such as weights and variance estimation stratum.

Fields in the data files may be categorical or continuous. Categorical fields, such as region, sex, and race, have a discrete number of values. Continuous fields such as income and servings variables may have many values but are limited to the number of valid cases.

Due to the lack of a response or the lack of data necessary for calculations, some fields have missing values. These cases usually are coded into separate categories of "refused," "don't know," "not ascertained," or "cannot be calculated." In most situations, missing values are represented by special values rather than by blanks. The conventions for a one-column field are a "7" for "refused," an "8" for "don't know," and a "9" for "not ascertained".

Blanks or missing values in fields that usually contain values indicate that a response or calculation for that field does not apply. For example, blanks are included in sampling weight fields for persons not providing intake data. Also, the serving intake files (rt32.ssd and rt42.ssd) do not include children under the age of 2 years, therefore, the field for age in months (AGE_M) is blank.

Users may find it more efficient to design special data sets for a particular analysis, rather than repeatedly using the original data files. Designing special files involves restructuring the data to conform to specific processing needs and reducing the file size. An example is selecting only Day 1 records when analyzing servings from Day 1.

Because of the complex sample design of the CSFII, ARS suggests that data users calculate variance estimates and related statistics using software that takes the sample design and weighting into account. The PSUs used in the design can be paired as in a stratified sample where the Taylor Series expansion method can be used. This will allow software such as SUDAAN® or Stata® (Shah 1997, Stata 2000) to be used when studying population subgroups. The fields VARSTRAT and VARUNIT represent the nesting fields STRATUM and PSU used for Taylor Series expansion estimation of standard errors.

Weights are intended for use in developing summary information about the entire population under study, not just the sample, and should be used when calculating descriptive statistics -- means, medians, and variances. In addition, it is USDA's convention to follow guidelines derived from a report of the Life Sciences Research Office (FASEB/LSRO 1995) in identifying or flagging estimates of means, percentages, and percentiles presented in general reports that might be less statistically reliable than other estimates due to small cell size or high relative variability. For guidelines on flagging estimates and CSFII documentation on sampling weights refer to the documentation on the CSFII 1994-96, 1998 (USDA/ARS 2000a).

Most statistical software packages use the weights similarly to compute weighted means. It should be noted, however, that some use them differently in analytical procedures. Therefore, special care may be needed when making valid statistical inferences from survey data using weighted means and the subsequent analysis validating apparent differences. If in doubt, the analyst is advised to consult a survey statistician.

5.5. References

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