Composition of Foods:
Raw Processed Prepared

USDA Nutrient Database for Standard Reference,
Release No. 12

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Introduction

The USDA Nutrient Database for Standard Reference (SR) is the major source of food composition data in the United States and provides the foundation for most public and private sector databases. As food composition data are updated, new versions of the database are released. This version, the USDA Nutrient Database for Standard Reference, Release 12 (SR12) contains data on 5,976 food items for up to 81 food components. It replaces the previous release (SR11-1) issued in August 1997 and adds food composition data for a few hundred new items. As beef cuts, trimmed to 1/2" external fat are not widely available in the marketplace, these items, except for prime grade cuts, have been removed from the database. Every food item may not contain a complete nutrient profile. Data on selenium for a large number of foods have been added to the database in this release. We have also updated the folate values in the database to reflect regulations promulgated by the Food and Drug Administration requiring the addition of folic acid to enriched grain products (45), which became effective on January 1, 1998. A number of other items have been updated. Although most foods, with the exception of breakfast cereals and infant formulas, have generic descriptions, there has been an expansion of data for brand name products. SR12 includes all the food composition data published in the 21 sections and four supplements of Agriculture Handbook No. 8 (AH-8) (17-41) unless those have been updated since 1992. If there are differences between the printed sections and the electronic release, the electronic release supersedes the printed version.

Data were compiled from published and unpublished sources. Published sources include the scientific and technical literature. Unpublished data are from the food industry, other government agencies, and research conducted under contracts initiated by the Agricultural Research Service (ARS). Values may be analytical or calculated by the use of appropriate factors or recipes. The source code field in the Nutrient Data file (page 15) provides more information on the type of data.

The SR is the responsibility of the staff of the Nutrient Data Laboratory (NDL), Agricultural Research Service (ARS), Beltsville Human Nutrition Research Center, U.S. Department of Agriculture, Riverdale, Maryland, 20737.

Explanation of File Contents

The database is comprised of several separate data files. This section provides further details on the information provided in each of the data files. More extensive details on specific foods are available in the printed version of each Handbook section. The four principal files are: Food Description File, Nutrient Data File, Gram Weight File, and Footnote File. The four support files are: Nutrient Definition File, Measure Description File, Food Group Description File, and Source Code File.

Food Descriptions

Descriptive information about the food items is included in the Food Description File (Page 13). Descriptions are based on those published in AH-8, but may not match exactly. Abbreviations used in creating short descriptions are given in Appendix A. In creating the short description, the first word in the long description was not abbreviated. Also, if the long description was 25 characters or less, the short description contains no abbreviations. Abbreviations used elsewhere in the tables are given in Appendix B. Scientific names, refuse and refuse description are also provided in this file where appropriate. The factors used to calculate protein from nitrogen as well as those used to calculate calories are also included in this file.

REFUSE: The "Refuse" and "Refuse Description" fields in the Food Description File contain amounts and descriptions of inedible material (i.e., seeds, bone, skin) for those foods containing refuse. These amounts are expressed as the percentage of the total weight of the item as purchased and were used to compute the weight of the edible portion. Refuse data were obtained from Agriculture Handbook No. 102 (AH-102) (12), AH-456 (1), and information supplied from unpublished sources such as ARS contracts. To calculate "Amount in edible portion of 1 pound as purchased" (Column G in AH-8) use the following formula:

$$Y = V*(4.536*((100-R)/100))$$

Where:

Y = Nutrient value per 1 pound as purchased
V = Nutrient value per 100 grams (Nutr_Val in the Nutrient Data File)
R = Percent refuse (Refuse in the Food Description File)

For raw meats, the items as purchased are raw; for cooked meats, the values are the amounts in the edible portion from 1 pound of cooked meat with refuse. For meat cuts containing bone, any connective tissue present is included in the value given for bone. Separable fat is not shown as refuse if the meat is described as separable lean and fat. Separable lean refers to muscle tissue that can be readily separated out of the intact cut and includes any fat striations within the muscle. For a boneless cut, the refuse values are for connective tissue or connective tissue plus separable fat. The percentage yield of cooked edible meat from the corresponding raw meat with refuse can be determined to give the cooked weight of the edible portion from 1 pound of raw meat with refuse using the following formula:

$$Y = (W_c / 453.6) * 100$$

Where:

W_c = Weight of cooked edible meat

Nutrients

Nutrient values per 100 g are contained in the Nutrient File. It contains the mean, number of

samples, standard error and source code. The source code field indicates how the data value was determined (i.e. analytical, calculated, assumed zero, etc.). For more details on this file see the discussion under Format (Page 14). To provide users information on the completeness of the database, Table 1 lists the number of items containing data for each nutrient.

Analytical values represent the total amount of the nutrient present in the edible portion of the food, including any added to the product in preparation for the retail market. The values do not necessarily represent the amounts of the nutrient available to the body.

Table 1 - Number of foods in database[1] containing values for selected nutrients.

Nutrient	Number	Nutrient	Number
Protein	5976	Vitamin A (IU)	5858
Total lipid (fat)	5976	Vitamin A (RE)	5387
Carbohydrate, by difference	5976	Vitamin E	3409
Water	5976	Ascorbic acid	5793
Total dietary fiber	5350	Thiamin	5651
Ash	5953	Riboflavin	5649
Calcium	5894	Niacin	5654
Iron	5876	Pantothenic acid	5383
Magnesium	5669	Vitamin B_6	5562
Phosphorus	5680	Folate	5558
Potassium	5703	Vitamin B_{12}	5588
Sodium	5971	Cholesterol	5872
Zinc	5647	Total saturated fatty acids	5777
Copper	5583	Total monounsaturated fatty acids	5629
Manganese	4995	Total polyunsaturated fatty acids	5636
Selenium	3709		

[1] Database contains 5,976 foods.

When nutrient data on some prepared or cooked products were unavailable or incomplete, nutrient values were calculated from data for comparable raw items. Values for such nutrients are computed for cooked items by applying nutrient retention (43) and yield factors. The nutrient content per 100 grams of raw food is multiplied by the percentage retained after cooking, and this

product is divided by the percentage yield of cooked food to obtain the content of nutrient per 100 grams of cooked foods.

$$V_c = (V_r * RF)/Y_c$$

Where:

V_c = Nutrient content of cooked food
V_r = Nutrient content of raw food
RF = Retention factor
Y_c = Yield of cooked food

Retention factors are based on research funded by USDA contracts, recent research reported in the literature, and data from USDA publications. Retention factors were calculated by the True Retention Method (%TR) (14). This method, as shown below, accounts for the loss of solids from foods that occurs during preparation and cooking.

$$\%TR = \frac{\text{Nutrient content per g of cooked food} \times \text{g of food after cooking}}{\text{Nutrient content per g of raw food} \times \text{g of food before cooking}} \times 100$$

In general, levels of fortification nutrients are the values calculated by the manufacturer or by NDL food specialists based on the NLEA label declaration of %Daily Value (DV). Such values represent the minimum nutrient level to be expected in the product. If analytical values were available to estimate levels of added nutrients, there would be a number in the sample count field.

PROXIMATES: Proximate components include moisture (water), protein, total lipid (fat), carbohydrate, and ash.

Protein: The values for protein were calculated from the content of total nitrogen (N) in the food using the conversion factors recommended primarily by Jones (6). The specific factor applied to each food item is provided in the N_Factor Field in the Food Description File. The general factor of 6.25 is used to calculate protein in items for which a specific factor does not exist. No factor is present for prepared recipe items generated using the Nutrient Data Bank System recipe program or if protein calculated by the manufacturer is reported.

Protein values for chocolate, cocoa products, coffee, mushrooms, and yeast were adjusted for nonprotein nitrogenous material. The adjusted protein conversion factors used to calculate protein for these items are as follows: chocolate and cocoa (4.74), coffee (5.3), mushrooms (4.38), and yeast (5.7). When these items were used as ingredients, only their protein nitrogen content was used to determine their contribution to the protein and amino acid content of the food. Protein calculated from total nitrogen, which may contain non-protein nitrogen, was used in determining carbohydrate by difference. This unadjusted protein value is not given in the Nutrient Data File for SR12--it is given as a footnote in the printed sections of AH-8.

For soybeans, a factor of 5.71 (6) was used for calculating protein. However, this factor differs from the practices of the soybean industry that uses 6.25 to calculate protein. Protein content of soy flours, soy meals, soy protein concentrates, and soy protein isolates is expressed both ways. The item calculated using the 6.25 factor is identified as "...crude protein basis."

Total lipid (fat): Total lipid content of most foods was determined using extraction methods employing ether or a mixed solvent system consisting of chloroform and methanol.

Carbohydrate: Carbohydrate when present is determined as the difference between 100 and the sum of the percentages of water, protein, total lipid (fat), and ash (and alcohol when present). Total carbohydrate values include total dietary fiber. Total dietary fiber content was determined by the following AOAC (2) enzymatic-gravimetric methods: 985.29 and 991.43. Total sugars were determined using AOAC methods (2), either HPLC or GLC, and are the sum of individual monosaccharides (galactose, glucose, and fructose) and disaccharides (sucrose, lactose, and maltose). At this time, data for total sugars are available primarily for formulated foods. It is anticipated that data on total sugars for other foods will be added in future releases.

Food energy: Food energy is expressed in both kilocalories (kcal) and kilojoules (kJ). One kcal equals 4.184 kJ. The data are for physiological energy which is the energy value remaining after the losses in digestion and metabolism have been deducted from the gross energy. Calorie values are based on the Atwater system for determining energy values. Details for the derivation of the Atwater calorie factors are outlined in Agriculture Handbook No. 74 (13). For formulated foods, calorie values (source codes 8 or 9; for more information on source codes, see Page 15) generally reflect industry practices as permitted by the Nutrition Labeling and Education Act (NLEA) of calculating calories from 4-4-9 kcal/g for protein, carbohydrate, and fat, respectively or from 4-4-9 kcal/g for protein, carbohydrate minus insoluble fiber, and fat. The latter method is frequently used for high-fiber foods.

Calorie factors are listed in the Food Description File with fields for protein, fat, and carbohydrate. For those foods containing alcohol, a factor of 6.93 was used to calculate calories from alcohol. No calorie factors are presented for prepared items generated using the Nutrient Data Bank system recipe program. Calories for these items are the sums of the calories contributed by each ingredient after adjustment for changes in yield as appropriate. No calorie factors are presented for formulated foods if the calories calculated by the manufacturer are reported.

Calorie factors for fructose and sorbitol, not available in the Atwater system, were derived from the work of Livesay (10). Calorie factors for coffee and tea were estimated from seeds and vegetables, respectively.

MINERALS: Most minerals were determined by AOAC methods (2). Phosphorus was determined colorimetrically. Sodium and potassium were usually determined by flame photometry. Calcium, iron, magnesium, zinc, copper, and manganese were determined by atomic absorption and plasma emission spectrophotometry. Newer values were generally determined by

Inductively Coupled Plasma (ICP). Data on selenium for a large number of foods have been added to the database in this release. Selenium values for other foods will be added in future releases. Much of the analytical data on selenium was published earlier (42) and was determined by the modified selenium hydride and fluorometric methods. The other values added to the database were calculated from these values. Procedures for imputing values used by NDL were described previously (16). The selenium content of plants, in particular cereal grains, is strongly influenced by the quantity of biologically available selenium in the soil in which they grow and hence their geographical origin (8). The selenium content of fruits and vegetables is normally very low. While the selenium content of soil may affect the selenium content of fruits and vegetables, their content does not increase significantly when compared to cereal grains or meats. These are average values and are not appropriate to use for locally grown foods from high or low selenium soil content areas.

VITAMINS: All data for ascorbic acid are listed under nutrient number 401 (total ascorbic acid) although reduced ascorbic acid was reported for many food groups especially for those food groups which are major contributors of ascorbic acid such as fruits and vegetables. Total ascorbic acid was reported for Food Groups 1 (Dairy and Eggs), 2 (Spices and Herbs), 4 (Fats and Oils), 12 (Nut and Seeds , and 17 (Lamb, Veal and Game). Food Group 10, Pork and Pork Products contains a mixture of total and reduced forms which are reported under nutrient number 401. Reduced ascorbic acid was determined by the dichlorindophenol method and total ascorbic acid was determined by the fluorometric method.

Thiamin was determined chemically by the thiochrome procedure or by microbiological methods. Fluorometric or microbiological methods were used to measure riboflavin. The values for niacin are for preformed niacin only and do not include the niacin that would be contributed by tryptophan, a niacin precursor. The term, “niacin equivalent” applies to the potential niacin value, that is, to the sum of the preformed niacin and the amount that could be derived from tryptophan. In estimating the amounts of niacin available from foods, the mean value of 60 mg of tryptophan is considered equivalent to 1 mg of niacin (15).

Pantothenic acid was determined microbiologically. Vitamins B_6 and B_{12} were determined by microbiological or chromatographic methods. Vitamin B_{12} is found in foods of animal origin or those containing some ingredient of animal origin; i.e. cake that contains eggs and/or milk. For foods that contain only plant products, the value for vitamin B_{12} is assumed to be zero. Vitamin B_{12} has been reported in certain fermented foods (i.e. beer, soy sauce, and miso). It is believed that this B_{12} is synthesized not by the microorganisms responsible for the fermentation of the food, but rather by other contaminating microorganisms that may be present. Therefore, one should not consider these foods a reliable, consistent source of vitamin B_{12} (9).

Folate values represent total folate activity, in which bound folate is released by enzymatic treatment. Most analytical values shown for folate were determined by the use of conjugase and *Lactobacillus casei*. Beecher and Matthews (3) reported that methodology for folate is lacking, needing improvement in the areas of method development, extraction procedures and applications. Limited amounts of data generated by USDA through contract analyses were

obtained by a modified method using enzymes to release bound forms. Recent research on determining the folate content of high-protein and high-carbohydrate foods indicates that additional improvements in methodology are needed (11). The folate values in the data base have been updated to reflect regulations promulgated by the Food and Drug Administration requiring the addition of folic acid to cereal grain products that are subject to standards of identity (45). These products include flour, cornmeal and grits, farina, rice, macaroni, noodles, bread, rolls, and buns. Folic acid may continue to be added to breakfast cereals, infant formulas, medical foods, food for special dietary use and meal replacement products with some restrictions on the amounts that can be added. The regulations became effective on January 1, 1998. For the most part, values were calculated based on the enrichment levels specified in the regulations, as analytical values were not yet available. For those foods where the enrichment level is given as a range, the midpoint of the range was used. Food items containing any of these enriched products as ingredients, such as baked products made with enriched flour, have also been updated. As analytical values become available, the calculated values will be updated in future releases of the database.

The data for vitamin A include chemically determined preformed vitamin A and provitamin-A carotenoids as determined by AOAC methods. Total vitamin A activity is expressed both in international units (IU) and in retinol equivalents (RE). One IU is equivalent to 0.3 mcg of retinol, 0.6 mcg of beta-carotene or 1.2 mcg of other provitamin A carotenoids; one RE is equivalent to 1 mcg of retinol or 6 mcg of beta-carotene or 12 mcg of other provitamin A carotenoids. One RE is equal to 3.33 IU of retinol or 10 IU of beta-carotene (15).

Vitamin E was determined by gas liquid chromatography. The total vitamin E activity is reported as milligrams alpha-tocopherol equivalents from the amounts and relative activities for the various tocopherols and tocotrienols. Data reported in releases before SR11 as mg alpha-tocopherol or vitamin E have been deleted.

LIPID COMPONENTS: Fatty acids: The first number in the nutrient description is the number of carbon atoms and the second is the number of double bonds in the chain. Common and systematic names for the fatty acids are given in the Table 2. For unsaturated fatty acids, the common name reflects the most common isomer, although all isomers, including *cis* and *trans*, are included in the value. Most fatty acid data were obtained as the percentage of fatty acid methyl esters and were primarily determined by gas-liquid chromatographic analyses. The values shown are for the actual quantity of each fatty acid and do not represent fatty acid triglycerides. These data were converted to grams of fatty acid per 100 grams of total lipid (fat) using lipid conversion factors and then to grams of fatty acid per 100 grams edible portion of food using the total lipid content. Details of the derivation of lipid conversion factors have been published (46).

Table 2 - Systematic and Common Names for Fatty Acids

Fatty acid designation	Systematic name	Common name of most typical isomer
Saturated fatty acids		
4:0	butanoic	butyric
6:0	hexanoic	caproic
8:0	octanoic	caprylic
10:0	decanoic	capric
12:0	dodecanoic	lauric
14:0	tetradecanoic	myristic
15:0	pentadecanoic	
16:0	hexadecanoic	palmitic
17:0	heptadecanoic	margaric
18:0	octadecanoic	stearic
20:0	eicosanoic	arachidic
22:0	docosanoic	behenic
24:0	tetracosanoic	lignoceric
Monounsaturated fatty acids		
14:1	tetradecenoic	myristoleic
16:1	hexadecenoic	palmitoleic
18:1	octadecenoic	oleic
20:1	eicosenoic	gadoleic
22:1	docosenoic	erucic
Polyunsaturated fatty acids		
18:2	octadecadienoic	linoleic
18:3	octadecatrienoic	linolenic
18:4	octadecatetraenoic	parinaric
20:4	eicosatetraenoic	arachidonic
20:5	eicosapentaenoic	timnodonic
22:5	docosapentaenoic	clupanodonic
22:6	docosahexaenoic	

Values for total saturated, monounsaturated, and polyunsaturated fatty acids may include individual fatty acids not reported; therefore, the sum of their values may exceed the sum of the individual fatty acids listed. In rare cases, the sum of the individual fatty acids may exceed the sum of the values given for the total saturated (SFA), monounsaturated (MUFA), and polyunsaturated (PUFA). These differences are generally caused by rounding. In the case of brand name formulated foods, industry data were often available for fatty acid classes (SFA,

MUFA, and PUFA) but were lacking for individual fatty acids. In these cases, individual fatty acids were calculated from the ingredients and normalized to the total fat level. A best-fit approximation was made to fatty acid classes, but unavoidably individual fatty acid totals do not always represent an exact match with industry fatty acid class data. Zero values for individual fatty acids should be understood to mean that trace amounts of the individual fatty acid may be present. When grams of fatty acids per 100 grams of total lipid are converted to grams of fatty acids per 100 grams of food, converted values of less than 0.0005 are rounded to zero.

Cholesterol: It is assumed that cholesterol is present only in foods of animal origin and those foods containing some ingredient of animal origin (i.e., cake that contains eggs). Cholesterol values are generated primarily by gas-liquid chromatographic procedures. For mixtures containing some animal product, the cholesterol value may be calculated from the value for the animal ingredient.
For foods that contain only plant products, the value for cholesterol is assumed to be zero.

Phytosterols: Data on plant sterols (campesterol, stigmasterol, β-sitosterol) were obtained by either colorimetric or gas-chromatographic procedures.

AMINO ACIDS: The data represent results obtained primarily by ion-exchange chromatography. Amino acid contents of each item in grams per 100 grams were calculated by the following formula:

$$AA_f = (AA_n * V_p) / N_f$$

Where:

AA_f = Amino acid content per 100 grams of food
AA_n = Amino acid content per gram of nitrogen
V_p = Protein content of food
N_f = Nitrogen factor

The number of samples refers to the number of observations used in developing the amino acid pattern for the food. It appears only on the food item for which it was developed, not other foods which use the same pattern. For these other foods, the amino acid pattern is calculated based on the protein content.

If amino acid values are presented for an item with more than one protein-containing ingredient, amino acid values may have been calculated on a per-gram-of-nitrogen basis from the amino acid patterns of the various protein-containing ingredients. Then the amino acid contents for an item on the 100 gram basis were calculated as the sum of the amino acids in each protein-containing ingredient multiplied by the total nitrogen in the item.

Weights and Measures

Information is provided on household measures (i.e., 1 cup, 1 tablespoon, 1 fruit, 1 leg) for food

items. Weights are given for edible material without refuse. The Weight File (Page 17) contains the gram weight equivalents for each food item. The description of each measure is provided in a separate file–the Measure Description File (Page 17). The Weight File can be used to calculate nutrient values for these food portions from the values provided per 100 grams of food (Columns E and F in AH-8). The formula to calculate the nutrient content per household measure is:

$$N = (V * W)/100$$

Where:

N = Nutrient value per household measure
V = Nutrient value per 100 grams (Nutr_Val in the Nutrient Data File)
W = Gram weight of portion (Gm_wt in Weight File)

Together these files can be used to produce reports showing the household measure and nutrient values calculated to that portion. The weights were derived from published sources, industry files, data in USDA contract reports, U.S. Department of Agriculture Handbook No. 456 (AH-456) (1), Home Economics Research Report No. 41 (HERR-41) (4), and the USDA Food Coding Data Base Weights and Measures File (44). Although special efforts were made to provide representative values, weights/measures for some foods vary considerably when obtained from different sources.

Footnotes

Footnotes are provided for a limited number of items where there is information on either the food description, weights and measures, or nutrient values which can not be accommodated in existing fields. Many of the footnotes previously published in Agriculture Handbook No. 8 are no longer needed as the information has been moved to other fields and tables. For example, further details on the measure description, once contained in footnotes, are now part of the measure description. Values for additional nutrients once included in footnotes, when appropriate, have been given nutrient numbers and included in the nutrient data file. Items have been added to the database to incorporate data included in footnotes covering enrichment or fortification, or when the nutrient content of an item is affected by color (i.e. yellow and white corn) or part of the plant analyzed. The remaining footnotes from Agriculture Handbook No. 8 will be added to this file in future releases.

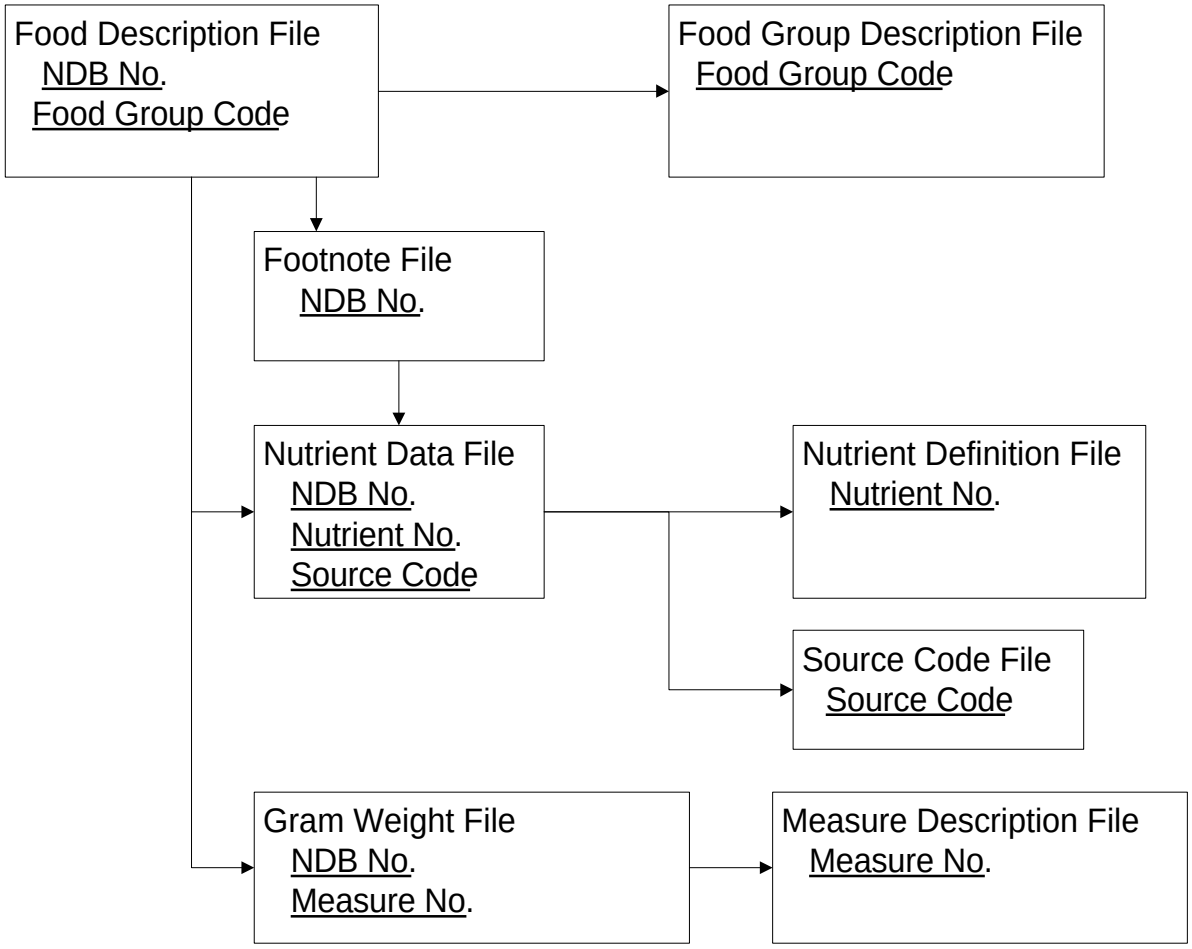
Explanation of File Formats

The data base is comprised of several separate files. This document lists the data files, indicates the relationships among the data files, and provides the format for each file. There are four principal files: Food Description File, Nutrient Data File, Gram Weight File, and Footnote File. There are four support files: Nutrient Definition File, Measure Description File, Food Group Description File, and Source Code File. A diagram showing the relationship between these files is given in Figure 1. The data files are provided in four different file formats: two relational, ASCII, and DBF, and two flat: the “abbreviated” and the Standard Product Data Exchange

Format, Version 3.01 developed by the International Food Distributors Association (IFDA). The fields in each file, identified as "reserved for future use" have been removed. When new fields are added, they will be indicated in the documentation.

RELATIONAL FILES

Fields which always contain data and those fields which can be left blank or null are indicated in the "Blank" column in the following tables. An asterisk (*) indicates when the field is indexed.



Although ASCII and DBF files are not indexed, indexes are identified in this document as they show those fields which are used to sort records within the Nutrient Databank System. Users may wish to import these files into their own data base management systems to facilitate access. If files are indexed, it is important to use the same indices listed here, particularly with the Nutrient Data File which uses two.

ASCII

Files are ASCII, delimited. All fields are separated by carets (^) and text fields are surrounded by

tildes (~). A double caret (^^) will appear when a field is null or blank. Format descriptions listed here include the name of each field; its type (N=numeric with width and number of decimals (w.d) and A=alphanumeric); and its length.

DBF

Files are in DBF format and can be read by most database management systems. If necessary refer to the appropriate program manuals or to on-line help to find out how to import the files. The files and fields are identical to those of the ASCII files.

Food Description File: (File Name = FOOD_DES)

The Food Description File contains both a long and short description for 5,976 food items along with the scientific name, refuse, and the factors used for calculating protein, and calories if applicable.

- Links to the Food Group Description File by the FdGp_Cd field.
- Links to the Nutrient Data File by the NDB_No field
- Links to the Gram Weight File by the NDB_No field
- Links to the Footnote File by the NDB_No field

Field Name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank number which uniquely identifies a food item
FdGp_Cd	A 4	N	4-digit code indicating food group to which a food item belongs.
Desc	A 200	N	200 character description of food item
Shrt_Desc	A 60	N	60 character abbreviated description of food item. Generated from the 200 character description using abbreviations in Appendix A. If short description was longer than 60 characters, additional abbreviations were made.
Ref_desc	A 45	Y	Description of inedible parts of a food item, such as, seeds or bone.
Refuse	N 2.0	Y	The percent refuse
SciName	A 60	Y	The scientific name of the food item. Given for the least processed form of the food (usually raw), if applicable.

N_Factor	N 4.2	Y	Factor for converting nitrogen to protein
Pro_Factor	N 4.2	Y	Factor for calculating calories from protein.
Fat_Factor	N 4.2	Y	Factor for calculating calories from fat.
CHO_Factor	N 4.2	Y	Factor for calculating calories from carbohydrate.

Food Group Description File: (File Name = FD_GROUP)

- Links to the Food Description File by FdGp_Cd

Field Name	Type	Blank	Description
FdGp_Cd	A 4*	N	Four digit code identifying a food group. Currently only the first 2 digits are assigned. In the future the last 2 digits may be utilized.
FdGp_Desc	A 60	N	The name of the food group

Nutrient Data File (File Name = NUT_DATA)

The Nutrient Data File contains the nutrient values and information about them including, sample count and standard error for analytical values and a source code indicating the type of data.

- Links to the Food Description File by NDB_No
- Links to the Nutrient Definition File by Nutr_No
- Links to the Source Codes File by Src_Cd
- Links to the Gram Weight File by NDB_No
- Links to Footnote file by NDB_No and Nutr_No

Field Name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank number.
Nutr_No	A 3*	N	3-digit unique identifier code for a nutrient
Nutr_Val	N 10.3	N	Amount in 100 grams, edible portion. (Due to limitations of the file formats all nutrient values are displayed to three decimal places; this does not necessarily reflect the accuracy of the data).
Sample_Ct	N 5.0	N	Number of samples

Std_Error	N 8.3	Y	Standard error of the mean. Null if could not be calculated
Src_Cd	A 2	N	Code indicating type of data

Nutrient Definition File (File Name = NUTR_DEF)

The Nutrient Definition File is the support file to the Nutrient Data File. It identifies the 3 digit nutrient number code with the unit of measure, INFOODS tagname, IFDA number, and description.

- Links to Nutrient Data File by Nutr_No

Field Name	Type	Blank	Description
Nutr_No	A 3*	N	3-digit unique identifier code for a nutrient
Units	A 6	N	Units of measure - mg, g, mcg, etc.
Tagname	A 20	N	INFOODS Tagnames (7). A unique abbreviation for a food component developed by INFOODS to aid in the interchange of data.
NutrDesc	A 60	N	The name of the food component
IFDA_No	A 3	N	Number assigned by the International Food Distributors Association (IFDA) to each nutrient. Provided for users who wish to convert the data to the IFDA data exchange format (5).

Source Code File: (File Name = SOURCE)

- Links to the Nutrient Data File by Src_Cd

Field Name	Type	Blank	Description
Src_Cd	A 2*	N	2 digit code
SrcCd_Desc	A 60	N	Description of source code that identifies the type of nutrient data.

The Source Code File contains codes to give the user an indication of the type of data (i.e. analytical, calculated, assumed zero, etc.) in the Nutrient Data File. In versions of the SR prior to

SR11 there was not a separate field to indicate the type of data in the file. The standard error field was used for this purpose. If there was a value in the standard error field, the nutrient value was based on analytical data. If the value with no standard error was published in the printed sections of Handbook 8, a -1 was placed in this field. If a value was missing from the printed Handbook section, but was imputed for SR, then a -4 was placed in the standard error field. For breakfast cereals, where values for added nutrients were based on the label declaration from the manufacturer, a code of -5 was placed in the field.

In converting to the new format for SR11, a value of -1 in the standard error field was converted to a 1 and moved to the new source code field. The standard error field was then blank if an actual value was not reported. If there was an actual standard error, a source code of 1 was put in the source code field. The -4 was converted to 4 and the -5 was converted to 5.

To improve the usability of the database, food specialists in NDL have filled in nutrient values for many proximate components, total dietary fiber, vitamin and mineral values. Values for other nutrients, such as alcohol and vitamin E, were filled in because the food items are part of the data base that is used for the USDA Continuing Survey of Food Intakes by Individuals (CSFII).

We have added additional source codes to be more specific about the type of data used for processed and brand name products starting with SR11 and continuing with subsequent releases. Previous versions of SR were not reviewed to revise source codes. Therefore the new source codes that have been added are used only for items that are new or were revised starting with the release of SR11. As existing items are revised, source codes will be updated.

The few exceptions are:

- Carbohydrate values of zero in animal products were given the source code of 7 which indicates an assumed zero.
- Carbohydrate values which were calculated by difference were given a source code of 4.
- Energy values which were calculated by Atwater factors are given a source code of 4.
- Cholesterol and vitamin B_{12} values of zero in plant products were given a source code of 7.
- Vitamin C and total dietary fiber values of zero in animal products were given a source code of 7.

SOURCE CODE LIST

Code	Description
1	The value is analytical or derived from analytical.
4	The value is imputed.
5	The value upon which a manufacturer based their label claim for added nutrients (Used primarily for Breakfast Cereals and Infant Formulas)

7 The value is an assumed zero. The nutrient is not expected to be present because biologically it could not be present, such as dietary fiber in animal products, or the nutrient is expected to be present in only insignificant amounts, such as vitamin C in meat products.

8 The value is calculated from the nutrient label by NDL.

9 The value is calculated by the manufacturer, not adjusted or rounded for NLEA compliance.

12 The value is analytical, supplied by the manufacturer with partial documentation.

Gram Weight File: (File Name = WEIGHT)

The Gram Weight File contains the gram weight for household measures for a food item with the measure number that links it to the description of the measure.

- Links to Food Description File by NDB_No
- Links to the Measure Description File by Msre_No
- Links to the Nutrient Data File by NDB_No

Field Name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank No.
Msre_No	A 5*	N	A unique code in the Measure Description File referencing the description
Gm_wt	N 9.2	N	The weight of the food item

Measure Description File: (File Name = MEASURE)

The Measure Description File is the support file for the Gram Weight File. It contains the 5 digit measure number and measure description.

- Links to the Gram Weight File by Msre_No

Field Name	Type	Blank	Description
Msre_No	A 5*	N	5 digit code denoting the measure
Msre_Desc	A 120	N	The description of the measure, i.e. "cup", "cup, chopped", "tomato", "tbsp", etc.

Footnote File: (File Name = FOOTNOTE)

The footnote file contains additional information about the food item, a household weight, or a nutrient value.

- Links to Food Description File by NDB_No
- Links to the Nutrient Data File by NDB_No and Nutr_No

Field Name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank No.
Footnt_no	A 4*	N	A sequence number
Footnt_typ	A 1	N	The type of footnote: D=Indicates a footnote adding information to the description; and N=Indicates a footnote providing additional information on a nutrient value. If the Footnt_typ = N, the Nutr_No will also be filled in.
Nutr_No	A 3	Y	3-digit unique identifier code for a nutrient to which the information in the footnote applies.
Footnt_txt	A 200	N	The text of the footnote

FLAT FILES

<u>Abbreviated</u> (File Name = ABBREV)

This file is in free format, with fields separated by carets (^). Text fields are surrounded by a tilde(~). The data in the file refer to 100 gram amounts of the edible portion of the food item. Decimal points are included in the fields. Missing values are denoted by a null value. This will appear as two consecutive carets (^^). The file is sorted in ascending order by the food item number.

This file is an adaptation of the Abbreviated File included with releases prior to SR11 and is provided as a convenience for users of that file. Because of the restructuring of the SR files with the release of SR11, some changes were made to this file as well: 1) The 20-character name is replaced with the 60-character short description; 2) the nutrients magnesium, zinc, copper, manganese, selenium, vitamin B_6, pantothenic acid, folate, vitamin B_{12} and vitamin E have been added; and 3) only the first two weights and their description for each NDB No. in the gram weight file are included, which may not be the same two weights as in previous releases of this file.

Field Name	Type	Description
NDB No.	A 5*	5-digit Nutrient Data Bank number.
Shrt_Desc	A 60	60 Character abbreviated description of food item. The 200 character description and other descriptive information can be obtained by linking to the Food Description File.
Water	N 10.3	Water in grams per 100 g
Energ_Kcal	N 10.3	Food Energy in kilocalories per 100 g
Protein	N 10.3	Protein in grams per 100 g
Tot_Lipid	N 10.3	Total lipid (fat) in grams per 100 g
Carbohydrt	N 10.3	Carbohydrate, by difference in grams per 100 g
Fiber_TD	N 10.3	Total dietary fiber in grams per 100 g
Ash	N 10.3	Ash in grams per 100 g
Calcium	N 10.3	Calcium in milligrams per 100 g
Phosphorus	N 10.3	Phosphorus in milligrams per 100 g
Iron	N 10.3	Iron in milligrams per 100 g
Sodium	N 10.3	Sodium in milligrams per 100 g
Potassium	N 10.3	Potassium in milligrams per 100 g
Magnesium	N 10.3	Magnesium in milligrams per 100 g
Zinc	N 10.3	Zinc in milligrams per 100 g
Copper	N 10.3	Copper in milligrams per 100 g
Manganese	N 10.3	Manganese in milligrams per 100 g
Selenium	N 10.3	Selenium in micrograms per 100 g
Vit_A	N 10.3	Vitamin A in IU per 100 g
Vit_E	N 10.3	Vitamin E in mg α-tocopherol equivalents
Thiamin	N 10.3	Thiamin in milligrams per 100 g
Riboflavin	N 10.3	Riboflavin in milligrams per 100 g
Niacin	N 10.3	Niacin in milligrams per 100 g

Panto_acid	N 10.3	Pantothenic acid in milligrams per 100 g
Vit_B6	N 10.3	Vitamin B_6 in milligrams per 100 g
Folate	N 10.3	Folate in micrograms per 100 g
Vit_B12	N 10.3	Vitamin B_{12} in micrograms per 100 g
Vit_C	N 10.3	Vitamin C in milligrams per 100 g
FA_Sat	N 10.3	Saturated fatty acid in grams per 100 g
FA_Mono	N 10.3	Monounsaturated fatty acids in grams per 100 g
FA_Poly	N 10.3	Polyunsaturated fatty acids in grams per 100 g
Cholestrl	N 10.3	Cholesterol in milligrams per 100 g
GmWt_1	N 9.2	The first household weight for this item from the Gram Weight File. For the complete list and description of the measure, link to that file.
GmWt_Desc1	A 120	Description of household weight number 1
GmWt_2	N 9.2	The second household weight for this item from the Gram Weight File. For the complete list and description of the measure, link to that file.
GmWt_Desc2	A 120	Description of household weight number 2
Refuse_Pct	N 2.0	The percent refuse. For description of refuse, link to the Food Description File

IFDA Standard Product Data Exchange Format

The data files have been converted to the IFDA Standard Product Data Exchange Format (5). This format was developed by IFDA to facilitate the exchange of product information, including nutrient data, between food manufacturers, suppliers and their various customers throughout the food chain.

UPDATE FILES

Change files in the formats described below are provided for those users who have reformatted previous releases for their systems and wish to do their own updates. Those items which are added for this release do not have corresponding pages in AH-8. If the update files which accompanied SR11-1 were not added to your database, it will be necessary to obtain those files before using the change files which accompany SR12. Items added to Release 12 are given in five files, “ADD_FOOD” for the descriptions of the new items, “ADD_NUTR” for the nutrient data,

"ADD_WGT" for the gram weight data, "ADD_FTNT" for the footnotes, "ADD_MSRE" for the Measure Description File, and "ADD_NDEF" for the nutrient definition file. These files are in the same format as the Food Description file (page 13), the Nutrient Data file (page 14), the Gram Weight file (page 17), the Measure Description File (page 17), the Footnote File (page 18), and the Nutrient Definition File (page 15).

There are three files which contain changes since Release 11-1. "CHG_FOOD" contains those records with any changes in the descriptive information for a food item. "CHG_NUTR" contains changes to nutrient values, standard errors or counts. If either the nutrient value, number of samples, standard error changed, the entire record is included. The file "CHG_WGT" contains those records where the gram weight of the item has changed. "CHG_FDGP" contains changes in the food group file, and "CHG_NDEF" contains changes to the Nutrient Definition File These files are in the same format as the Food Description file (page 13), the Nutrient Data file (page 14), the Gram Weight file (page 17), Food Group Definition File (page 14), and the Nutrient Definition File (page 15). The eleven update files are provided in both ASCII and DBF formats.

Items that have been deleted from the database are given in the file "DEL_FOOD." In some cases, nutrient values have been removed. For example, when protein values for a breakfast cereal were updated and new amino acid data were not available, the old amino acid values were deleted. These records are in the file "DEL_NUTR." The file "DEL_WGT" contains those household weights which have been removed from the database. The file "DEL_MSRE" contains those household measures which have been removed from the database, either because the corresponding household weight or food item was also removed. In some cases, items were included in more than one AH-8 section for the convenience of the user. Where two different NDB numbers were assigned to duplicate occurrences of the same item, one of them has been removed from the database. A list of these items is given in the file "DUPLICAT".

Items Deleted (File Name = DEL_FOOD)

Field Name	Type	Blank	Description
NDB_No	A 5*	N	The 5-digit unique number identifying the item to be deleted
Shrt_Desc	A 60	N	60-character abbreviated description of the food item

Nutrients Deleted (File Name = DEL_NUTR)

Field Name	Type	Blank	Description
NDB_No	A 5*	N	The 5-digit unique number identifying the item containing the nutrient record to be deleted
Nutr_No	A 3	N	The nutrient number of the record to be deleted.

Weights Deleted (File Name = DEL_WGT)

Field Name	Type	Blank	Description
NDB_No	A 5*	N	The 5-digit unique number identifying the item containing the nutrient record to be deleted
Msre_No	A 5*	N	A unique code in the Measure Description File referencing the description

Measures Deleted (File Name = DEL_MSRE)

Field Name	Type	Blank	Description
Msre_No	A 5*	N	A unique code in the Measure Description File referencing the description
Msre_Desc	A 120	N	The description of the measure deleted, i.e. "cup", "cup, chopped", "tomato", "tbsp", etc.

Duplicate Items Removed (File Name = DUPLICAT.TXT)

Field Name	Type	Blank	Description
Old_NDB_No	A 5	N	The 5-digit unique number identifying the duplicate item to be deleted
New_NDB_No	A 5	N	The 5-digit unique number identifying the item which replaces the item to be deleted
Shrt_Desc	A 60	N	60-character abbreviated description of the food item denoted by the new NDB No.

Update files have also been provided for the Abbreviated file in both ASCII and DBF. The file "CHG_ABBR" contains those records for food items where either a food description, household weight, refuse value or nutrient value was added, changed, or deleted since SR11-1. This file is in the same format as the abbreviated file (page 18). "DEL_ABBR" contains those food items which have been removed from the database. It is in the same format as "DEL_FOOD" given below. "ADD_ABBR" contains those food items which have been added since SR11 and is also in the same format as the abbreviated file.

Disclaimer

The use of trade, firm, or corporation names in this database is for information and convenience of the user. Such use does not constitute an official endorsement or approval by the USDA Agricultural Research Service of any product or service to the exclusion of others that may be suitable.

The suggested citation for this database is:

U.S. Department of Agriculture, Agricultural Research Service. 1998. USDA Nutrient Database for Standard Reference, Release 12. Nutrient Data Laboratory Home Page, http://www.nal.usda.gov/fnic/foodcomp

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Appendix A - Abbreviations Used in Generating Short Descriptions

All Purpose	ALLPURP
Aluminum	AL
And	&
Apple	APPL
Apples	APPLS
Applesauce	APPLSAUC
Approximate	APPROX
Approximately	APPROX
Arm and Blade	ARM&BLD
Artificial	ART
Ascorbic Acid	VIT C
Aspartame	ASPRT
Aspartame-sweetened	ASPRT-SWTND
Babyfood	BABYFD
Baked	BKD
Barbequed	BBQ
Based	BSD
Beans	BNS
Beef	BF
Beverage	BEV
Boiled	BLD
Boneless	BNLESS
Bottled	BTLD
Bottom	BTTM
Braised	BRSD
Breakfast	BRKFST
Broiled	BRLD
Buttermilk	BTTRMLK
Calcium	CA
Calorie	CAL
Calories	CAL
Canned	CND
Carbonated	CARB
Center	CNTR
Cereal	CRL
Cheese	CHS
Chicken	CHICK
Chocolate	CHOC
Choice	CHOIC
Cholesterol	CHOL
Cholesterol-free	CHOL-FREE
Chopped	CHOPD
Cinnamon	CINN
Coated	COATD
Coconut	COCNT
Commercial	COMM
Commercially	COMMLY
Commodity	CMDTY
Composite	COMP
Concentrate	CONC
Concentrated	CONCD
Condensed	COND
Condiment	CONDMNT
Condiments	CONDMNT
Cooked	CKD
Cottonseed	CTTNSD
Cream	CRM
Creamed	CRMD
Dark	DK
Decorticated	DECORT
Dehydrated	DEHYD
Dessert	DSSRT
Desserts	DSSRT
Diluted	DIL
Domestic	DOM
Drained	DRND
Dressing	DRSNG
Drink	DRK
Drumstick	DRUMSTK
English	ENG
Enriched	ENR
Equal	EQ
Evaporated	EVAP
Except	XCPT
Extra	EX
Flank Steak	FLANKSTK
Flavored	FLAV
Flour	FLR
Food	FD
Fortified	FORT
French Fried	FRENCH FR
French Fries	FRENCH FR
Fresh	FRSH
Frosted	FRSTD

Frosting	FRSTNG
Frozen	FRZ
Grades	GRDS
Gram	GM
Green	GRN
Greens	GRNS
Heated	HTD
Heavy	HVY
Hi-meat	HI-MT
High	HI
Hour	HR
Hydrogenated	HYDR
Imitation	IMITN
Immature	IMMAT
Imported	IMP
Include	INCL
Includes	INCL
Including	INCL
Infant Formula	INF FORMULA
Ingredient	ING
Instant	INST
Juice	JUC
Junior	JR
Kernels	KRNLS
Large	LRG
Lean	LN
Lean Only	LN
Leavened	LVND
Light	LT
Liquid	LIQ
Low	LO
Low Fat	LOFAT
Marshmallow	MARSHMLLW
Mashed	MSHD
Mayonnaise	MAYO
Medium	MED
Mesquite	MESQ
Minutes	MIN
Mixed	MXD
Moisture	MOIST
Natural	NAT
New Zealand	NZ
Non Fat Dry Milk	NFDM
Non Fat Dry Milk Solids	NFDMS
Non Fat Milk Solids	NFMS
Noncarbonated	NONCARB
Not Further Specified	NFS
Nutrients	NUTR
Nutrition	NUTR
Ounce	OZ
Pack	PK
Par fried	PAR FR
Parboiled	PARBLD
Partial	PART
Partially	PART
Partially fried	PAR FR
Pasteurized	PAST
Peanut	PNUT
Peanuts	PNUTS
Phosphate	PO4
Phosphorus	P
Pineapple	PNAPPL
Plain	PLN
Porterhouse	PRTRHS
Potassium	K
Powder	PDR
Powdered	PDR
Precooked	PRECKD
Preheated	PREHTD
Prepared	PREP
Processed	PROC
Product Code	PROD CD
Propionate	PROP
Protein	PROT
Pudding	PUDD
Puddings	PUDD
Ready-to-bake	RTB
Ready-to-Cook	RTC
Ready-to-drink	RTD
Ready-to-eat	RTE
Ready-to-feed	RTF
Ready-to-heat	RTH
Ready-to-serve	RTS
Ready-to-use	RTU
Reconstituted	RECON
Reduced	RED
Reduced-calorie	RED-CAL
Refrigerated	REFR

Regular	REG
Reheated	REHTD
Replacement	REPLCMNT
Restaurant-prepared	REST-PREP
Retail	RTL
Roast	RST
Roasted	RSTD
Round	RND
Sandwich	SNDWCH
Sauce	SAU
Scalloped	SCALLPD
Scrambled	SCRMBLD
Seed	SD
Select	SEL
Separable [1]	
Shank and Sirloin	SHK&SIRL
Short	SHRT
Shoulder	SHLDR
Simmered	SIMMRD
Skin	SKN
Small	SML
Sodium	NA
Solids	SOL
Solution	SOLN
Soybean	SOYBN
Special	SPL
Species	SP
Spread	SPRD
Standard	STD
Steamed	STMD
Stewed	STWD
Stick	STK
Sticks	STKS
Strained	STR
Substitute	SUB
Summer	SMMR
Supplement	SUPP
Sweet	SWT
Sweetened	SWTND
Sweetener	SWTNR
Teaspoon	TSP
Thousand	1000
Toasted	TSTD
Toddler	TODD
Trimmed [1]	
Trimmed to [1]	
Uncooked	UNCKD
Uncreamed	UNCRMD
Undiluted	UNDIL
Unenriched	UNENR
Unheated	UNHTD
Unprepared	UNPREP
Unspecified	UNSPEC
Unsweetened	UNSWTND
Varieties	VAR
Variety	VAR
Vegetable	VEG
Vegetables	VEG
Vitamin A	VIT A
Vitamin C	VIT C
Water	H20
Whitener	WHTNR
Whole	WHL
Winter	WNTR
With	W/
Without	WO/
Yellow	YEL

[1] Removed in short description.

Appendix B - List of Abbreviations Used Elsewhere in the Tables

ap	as purchased
approx	approximately
ARS	Agricultural Research Service
ate	alpha-tocopherol equivalent
dia	diameter
fl oz	fluid ounce
g	gram
IU	international unit
kcal	kilocalorie
kJ	kilojoule
lb	pound
mcg	microgram
mg	milligram
ml	milliliter
NDB	Nutrient Data Bank
NDL	Nutrient Data Laboratory
NFS	not further specified
NS	not specified
oz	ounce
RE	retinol equivalent