Composition of Foods
Raw, Processed, Prepared
USDA National Nutrient Database for Standard Reference, Release 15

December 2002

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U.S. Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. 2002. USDA National Nutrient Database for Standard Reference, Release 15.

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Issued December 2002

Contents

Introduction

The USDA Nutrient Database for Standard Reference (SR) is the major source of food composition data in the United States. It provides the foundation for most food composition databases in the public and private sectors. As information is updated, new versions of the database are released. This version, Release 15 (SR15), contains data on 6,220 food items and up to 117 food components. It replaces SR14, issued in July 2001.

SR15 includes data for all the food groups and nutrients published in the 21 volumes of Agriculture Handbook 8 (U.S. Department of Agriculture 1976–92), and its four supplements (U.S. Department of Agriculture 1990–93), which superseded the 1963 edition (Watt and Merrill 1963). Since 1992, updated data have been published electronically on NDL's web site. SR15 supersedes all previous releases, including the printed versions, in the event of any differences.

With the first release of data from our new Nutrient Databank System (NDBS) in July 2001, we have changed some formats and have added fields to improve the descriptive information for food items and the statistical information about the nutrient values. While data in previous releases have been moved to the new NDBS, they have not been processed through the complete system. Therefore, many of these new fields contain data for only a limited number of items and it will take several years before they are populated for most food items in the database.

We compiled data from published and unpublished sources. Published sources include the scientific and technical literature. Unpublished data include those obtained from the food industry, other government agencies, and research conducted under contracts initiated by the Agricultural Research Service (ARS). Values in the database may be based on the results of laboratory analyses or calculated by using appropriate algorithms, factors or recipes, which is indicated by the source code in the Nutrient Data file. Every food item may not contain a complete nutrient profile.

Specific Changes

We made several major changes to the database since the last release:

C Replaced values for vitamin A in µg retinol equivalents (RE) by :g retinol activity equivalents (RAE). Added values for retinol for most foods.

C Updated ground beef data to reflect current market trends. Dropped previously released ground beef items at 27%, 22%, and 17% fat. Replaced them with ground beef items at 25%, 20%, and 15% fat. Also added new lower fat items.

  - Conducted a nationwide (24 outlets) sampling of ground beef products for each of the following fat levels: <12% fat, 12-22% fat, or >22% fat.
  - Then determined nutrient composition for raw and cooked products. Performed statistical analysis on results from these tests and calculated regression equations for each nutrient and for each preparation method.

- Estimated nutrient values from these equations for each product (75% lean meat/25% fat; 80% lean meat/20% fat; 85% lean meat/15% fat; 90% lean meat/10% fat; 95% lean meat/5% fat) prepared as follows: raw, broiled patties, pan-broiled patties, pan-browned crumbles, and baked loaf. Cooked all products to an internal temperature of 160 °F, except for the pan-browned crumbles which were cooked until juices ran clear.

C Added data on new beef cuts (chuck tender steak, chuck top blade, clod roast, clod steak, inside skirt and outside skirt steaks, tri-tip roast, tri-tip steak).

C Added data for emu, ostrich, deer, bison, and elk.

C Updated brand name ready-to-eat breakfast cereals to reflect current names and nutrient values. Removed cereals that are no longer on the market from the database.

Data Files

The data files for SR15 are in ASCII format. A description of each field in these files and the relationships between each is on p. 16. We have also made a Microsoft Access 2000 database available. This database contains all the SR15 files and relationships, with a few sample queries and reports. We have also included an abbreviated file (p. 24), with fewer nutrients. A Microsoft Excel 2000 spreadsheet of this file is also provided.

Reports

The data in SR15 are also included as reports in two different presentations. The first presents items in SR15 as page images, containing all the data for each food. These data are separated into files by food groups. The second presentation contains selected foods and nutrients in SR15. These reports are sorted either by food description or in descending order by nutrient content in terms of common household measures. The food items and weights in these reports are adapted from those in the recently revised U.S. Department of Agriculture Home and Garden Bulletin 72, Nutritive Value of Foods (Gebhardt and Thomas 2002).

The Adobe Acrobat Reader is needed to see these files. There is a link to the Internet site where it can be downloaded at no charge.

File Content

As mentioned earlier, the database consists of several separate data files. The sections below provide details about the information in each. More extensive details on many specific foods are available in the printed Agriculture Handbook 8 sections (U.S. Department of Agriculture 1976–92).

The four principal files are the Food Description file, Nutrient Data file, Gram Weight file, and Footnote file. The five support files are the Nutrient Definition file, Food Group Description file, Source Code file, Data Derivation Code file, and Sources of Data file.

Food Description File

This file includes descriptive information about the food items. Food descriptions for brand name items are in upper case. A full description and a short description (containing abbreviations) are provided. Abbreviations used in creating short descriptions are given in appendix A. In creating the short description, we did not abbreviate the first word in the long description. Also, if the long description was 25 characters or less, the short description contains no abbreviations. Abbreviations used elsewhere are given in appendix B. Scientific names, amounts of refuse, and refuse description are provided where appropriate. The factors used to calculate protein from nitrogen are included, as well as those used to calculate calories. There are no factors for items prepared using the recipe program of the NDBS or for items where protein and calories are calculated by the manufacturer. Three new fields have been included in this file since SR14:

1. Common name— includes local or regional names for various foods, for example, soda or pop for carbonated beverages,
2. Manufacturer name field—indicates the company that manufactured the product, when appropriate, and
3. Survey—indicates if the food item is used in a National Food and Nutrition Survey and has a complete nutrient profile for a specified set of nutrients.

Refuse

The refuse and refuse description fields contain amounts and descriptions of inedible material (for example, seeds, bone, skin) for applicable foods. These amounts are expressed as a percentage of the total weight of the item as purchased, and they were used to compute the weight of the edible portion. Refuse data were obtained from USDA-sponsored contracts and U.S. Department of Agriculture Handbooks 102 and 456 (Adams 1975, Matthews and Garrison 1975). To calculate “Amount of nutrient in edible portion of 1 pound as purchased,” 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 g (Nutr_Val in the Nutrient Data file), and
- R = percent refuse (Refuse in the Food Description file).

For meat cuts containing bone and connective tissue, the amount of connective tissue 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 fat generally refers to seam fat and intramuscular fat. Separable lean refers to muscle tissue that can be readily separated from the intact cut; it includes any fat striations (marbling) within the muscle. For boneless cuts, the refuse values apply to connective tissue or connective tissue plus separable fat. The percentage yield of cooked, edible meat from 1 pound of raw meat with refuse can be determined from the following formula:

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

where

W_c = weight of cooked, edible meat.

Nutrients

The Nutrient File contains nutrient values per 100 g, edible portion, along with fields to further describe the mean value. Nutrient values have been rounded to the number of decimal places for each nutrient as specified in the *Nutrient Definition file* (p. 20). With the implementation of the new NDBS, we have added a number of statistical attributes to better describe the mean. These include:

- Number of studies—the number of analytical studies used to generate a mean. A study is a discrete research project on the analysis of foods. A study can be the analysis of one nutrient in one food; one nutrient in many foods; or many nutrients in many foods.
- Minimum value—the smallest observed value in a range of values.
- Maximum value—the largest observed value in a range of values.
- Degrees of freedom—the number of values that are free to vary after we have placed certain restrictions on the data. Used in probability calculations.
- Lower- and upper-error bounds—represent a range of values the mean is expected to fall within, given a pre-specified confidence level. For the SR15 and related releases, the confidence level is 95 percent.
- Statistical comments—give additional details about certain assumptions made during statistical calculations. The definition of each comment is given in the discussion of the Nutrient Value file under *File Formats*.

We added other fields to expand the information on how the values are generated:

- Derivation code—gives more information about how a value was calculated or imputed. Procedures for imputing nutrient values were described by Schakel et al. (1997).
- Reference NDB number—indicates the NDB number of the food item that was used to impute a nutrient value for another food. This field is only populated for items added or updated since SR14.
- Added nutrient marker—a check indicates that a mineral or vitamin was added for enrichment or fortification. This field has not been populated for this release.
- Confidence code—indicates the quality of the data. This code is derived using the expert system first described by Mangels et al. (1993), which has been expanded and enhanced for the new NDBS (Holden et al, 2002). This field has not been populated for this release.
- DataSrc_ID—identifies the source of analytical data.

For more details on the Nutrient Data file, see *Explanation of File Formats* (p.19). Nutrient values give the total amount of the nutrient present in the edible portion of the food, including any nutrients added in processing. The values do not necessarily give the nutrient amounts available to the body. Table 1 gives an idea of the comprehensiveness of the database by listing for each nutrient the number of items that contain data.

Table 1. Number of foods in database (*n*=6,220) containing selected nutrients

Nutrient	Number of foods	Nutrient	Number of foods
Protein	6220	Vitamin D	305
Total lipid (fat)	6220	Vitamin E, ATE	3534
Water	6215	Alpha-tocopherol	652
Carbohydrate, by difference	6220	Beta-tocopherol	46
Total dietary fiber	5545	Gamma-tocopherol	54
Starch	38	Delta-tocopherol	47
Total sugar	1053	Ascorbic acid	5983
Sucrose	78	Thiamin	5830
Glucose	92	Riboflavin	5839
Fructose	92	Niacin	5831
Lactose	73	Pantothenic acid	5396
Galactose	17	Vitamin B_6	5687
Ash	6208	Folate, total	5671
Calcium	6095	Folic acid	5464
Iron	6118	Food folate	5468
Magnesium	5795	Folate, DFE	5463
Phosphorus	5855	Vitamin B_{12}	5695
Potassium	5946	Cholesterol	6110
Sodium	6216	Total saturated fatty acids	6023
Zinc	5776	Total monounsaturated fatty acids	5806
Copper	5699	Total polyunsaturated fatty acids	5813
Manganese	5163	Phytosterols	611
Selenium	5143	$-Sitosterol	34
Vitamin A (IU)	6049	Stigmasterol	34
Vitamin A (RAE)	5481	Campesterol	33
Retinol	5478		

When nutrient data for prepared or cooked products were unavailable or incomplete, nutrient values were calculated from comparable raw items or by recipe. When values are calculated in a recipe or from the raw item appropriate nutrient retention (U.S. Department of Agriculture 1994) and yield factors are applied. To obtain the content of nutrient per 100 g of cooked food, the nutrient content per 100 g of raw food is multiplied by the nutrient retention factor and, when appropriate, yield factors.

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

where:

V_c = nutrient content of cooked food,
V_r = nutrient content of raw food,
RF = retention factor, and
Y_c = yield of cooked food.

Nutrient retention factors are based on data from USDA research contracts, recent research reported in the literature, and USDA publications. Most retention factors were calculated by the True Retention Method (%TR) (Murphy et al. 1975). This method, as shown below, accounts for the loss of solids from foods that occurs during preparation and cooking.

$$\%TR = (N_c * G_c) / (N_r * G_r) \times 100$$

where

N_c = nutrient content per g of cooked food,
G_c = g of cooked food,
N_r = nutrient content per g of raw food, and
G_r = g of food before cooking.

In general, levels of fortified nutrients are the values calculated by the manufacturer or Nutrient Data Laboratory food specialists, based on the Nutrition Labeling and Education Act label declaration of %Daily Value (DV) (CFR, Title 21, Pts. 100–169). Such values represent the minimum nutrient level one can expect in the product. If analytical values were available to estimate levels of added nutrients, a number is present in the sample count field for these nutrients.

Proximates. Proximate components include water (moisture), protein, total lipid (fat), total carbohydrate, and ash. The values for protein were calculated from the level of total nitrogen (N) in the food, using the conversion factors recommended by Jones (1941). 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 that do not have a specific factor. There is no factor for items prepared using the recipe program of the NDBS or for items where protein is calculated by the manufacturer.

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
yeast	5.7

When these items were 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 nonprotein nitrogen, was used in determining carbohydrate by difference. This unadjusted protein value is not given in the Nutrient Data file for SR15; rather, it is given as a footnote in printed sections of Agriculture Handbook 8.

For soybeans, nitrogen values were multiplied by a factor of 5.71 (Jones 1941) to calculate protein. The soybean industry, however, uses 6.25 to calculate protein. The 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."

The total lipid (fat) content of most foods was determined by gravimetric methods, including extraction methods such as those that use ether or a mixed solvent system of chloroform and methanol, or by acid hydrolysis. Total lipid determined by extraction is reported as nutrient 204. It is sometimes referred to as 'crude fat' and includes the weight of all lipid components soluble in the solvent system. Nutrient 204 may not be identical to the fat level declared on food labels under the Nutrition Labeling and Education Act of 1990 (NLEA). Under NLEA, fat is expressed as the amount of triglyceride that would produce the analytically determined amount of lipid fatty acids. NLEA fat is commonly referred to as 'total fatty acids expressed as triglycerides'.

Carbohydrate, when present, was determined as the difference between 100 and the sum of the percentages of water, protein, total lipid (fat), ash, and, when present, alcohol. Total carbohydrate values include total dietary fiber. Total dietary fiber content was determined by the following enzymatic-gravimetric methods 985.29 and 991.43 of the Association of Official Analytical Chemists (AOAC 1995). Total sugars were determined using AOAC methods (1995), either high-performance liquid chromatography (HPLC) or gas-liquid chromatography (GLC), and are the sum of individual monosaccharides (galactose, glucose, and fructose) and disaccharides (sucrose, lactose, and maltose). Data for total sugars are available primarily for formulated foods, but we anticipate that values for other foods will likely be added in future releases. Starch was analyzed by AOAC method 966.11 (1995).

Food energy is expressed in kilocalories (kcal) and kilojoules (kJ). One kcal equals 4.184 kJ. The data are for physiological energy, which is the energy value remaining after losses from digestion and metabolism are deducted from gross energy. Calorie values, with the exception of formulated foods, are based on the Atwater system for determining energy values. Derivation of the Atwater calorie factors is outlined in Agriculture Handbook 74 (Merrill and Watt 1973). For formulated foods, calorie values (source codes 8 or 9; for more information on source codes, see p. 21) generally reflect industry practices (as permitted by the Nutrition Labeling and Education Act) of calculating calories from 4–4–9 kcal/g of protein, carbohydrate, and fat, respectively, or from 4–4–9 kcal/g of protein, carbohydrate minus insoluble fiber, and fat. The latter method is often used for high-fiber foods.

Calorie factors for protein, fat, and carbohydrates are included in the Food Description file. For foods containing alcohol, we used a factor of 6.93 to calculate calories per gram of alcohol. No calorie factors are given for items prepared using the recipe program of the NDBS. Instead, total calories for these items equal the sums of the calories contributed by each ingredient after adjustment for changes in yield, as appropriate. For formulated foods, if the calories calculated by the manufacturer are reported, no calorie factors are given.

Calorie factors for fructose and sorbitol, not available in the Atwater system, were derived from the work of Livesay and Marinos (1988). Calorie factors for coffee and tea were estimated from seeds and vegetables, respectively.

Minerals. Minerals included in the database are calcium, iron, magnesium, phosphorus, potassium, sodium, zinc, copper, manganese, and selenium. Levels of minerals for most foods were determined by methods of the AOAC (1995). Calcium, iron, magnesium, phosphorus, sodium, potassium, zinc, copper, and manganese were usually determined by atomic absorption and inductively coupled plasma emission spectrophotometry.

Much of the analytical data for selenium were published earlier (USDA 1992) and were determined by the modified selenium hydride and fluorometric methods. 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, that is, by their geographical origin (Kubota and Allaway 1972). The selenium content of fruits and vegetables is normally very low. While the soil affects the selenium content of fruits and vegetables, it does not significantly increase the amount of selenium in them. The values given are national averages and should be used with caution when considering levels of selenium in locally grown foods.

Vitamins. Vitamins included in the database are ascorbic acid (vitamin C), thiamin, riboflavin, niacin, pantothenic acid, vitamin B_6, folate, vitamin B_{12}, vitamin A, vitamin E, and vitamin D.

Ascorbic acid. In the current database system, all data for ascorbic acid are listed under Nutrient No. 401 (total ascorbic acid), although reduced ascorbic acid content is reported for many food groups, especially those that are major nutritional 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 No. 401. Reduced ascorbic acid was determined by the dichloroindophenol method, and total ascorbic acid by the fluorometric method.

Thiamin, Riboflavin, and Niacin. 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 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 tryptophan is considered equivalent to 1 mg niacin (NAS-IOM 1998).

<u>Pantothenic acid, Vitamins B_6, and B_{12}.</u> 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; for example, cake that contains eggs or milk. For foods that contain only plant products, the value for vitamin B_{12} is assumed to be zero. Some reports contain values for vitamin B_{12} in certain fermented foods (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. Therefore, one should not consider these foods to be a consistent source of vitamin B_{12} (Liem et al. 1977).

<u>Folate</u>. In addition to the total folate value previously reported, we are now reporting values for folic acid, food folate, and total folate reported as : g of DFE.

This change responds to new Dietary Reference Intakes (DRIs) for folate issued by the National Academy of Sciences, Institute of Medicine, (NAS-IOM 1998). Recommended Dietary Allowances for folate are expressed in dietary folate equivalents (DFE). DFE take into account the greater bioavailability of synthetic folic acid compared to naturally occurring food folate.

To calculate DFE, it is necessary to have separate values for naturally occurring food folate and added synthetic folic acid.

: g DFE = : g food folate + (1.7 x : g folic acid)

In 1998 (SR12), the folate values in the database were updated to reflect regulations requiring the addition of folic acid to enriched cereal grain products subject to standards of identity (CFR, Title 21, Pts. 136–137). These products include flour, cornmeal and grits, farina, rice, macaroni, noodles, bread, rolls, and buns. Folic acid may continue to be added (with some restrictions on amounts) to breakfast cereals, infant formulas, medical foods, food for special dietary use, and meal replacement products. For the most part, values for this database were calculated based on enrichment levels specified in the regulations, since analytical values were not yet available. For those foods where the enrichment level is given as a range, the midpoint was used to set the value. Food items containing any of these enriched products as ingredients, such as baked products made with enriched flour, were also updated.

In enriched and fortified foods, total folate includes food folate and added folic acid. The total folate values found in SR11-1 preceded the implementation of the new enrichment standards and represent the amount of folate naturally occurring in foods. For this release, we calculated folic acid by subtracting the food folate value in SR11-1 from the total folate content estimated in fortified foods for SR12.

For unenriched foods, the total folate value is food folate. Therefore, the value for total folate with number of data points and standard error, if present, was also used for food folate. The folic acid value was assumed to be zero.

Enriched ready-to-eat (RTE) cereals have generally included folic acid fortification for over 25 years. Therefore, food folate values were not readily available for these products. Food folate was estimated by means of the databank formulation program for a variety of high-consumption cereals. Mean folate values were calculated for categories of RTE cereals based on grain content. Added folic acid was then calculated by subtracting estimated food folate from the total folate content reported in SR13.

Most analytical values shown for folate were determined by the use of conjugase and *Lactobacillus casei*. Beecher and Matthews (1990) reported that the methodology used in determining folate values needed improvement, particularly in the areas of extraction procedures and applications to specific foods. Research on determining the folate content of high-protein and high-carbohydrate foods indicates that additional improvements in methodology are needed (Martin et al. 1990). Limited amounts of data generated by USDA were obtained by the tri-enzyme extraction using additional enzymes, amylase and protease to release bound forms of folate. Microbiological methods measure total folate; for enriched foods, folic acid and food folate are not distinguished from each other.

<u>Vitamin A.</u> In this release, in addition to the International Units (IU) that have been reported in the past, we are reporting values for vitamin A in : g of retinol activity equivalents (RAE) and : g of retinol. Values in : g of retinol equivalents (RE) have been dropped from the database.

This change responds to new DRIs for vitamin A issued by the National Academy of Sciences, Institute of Medicine (NAS-IOM, 2001). Along with the new DRIs the panel recommended changing the factors used for calculating vitamin A activity from the individual carotenoids and introduced retinol activity equivalent (RAE) as a new unit for expressing vitamin A activity. One : g RAE is equivalent to 1 : g of all-trans-retinol, 12 : g of all-trans-$-carotene or 24 : g of other provitamin A carotenoids. The RAE conversion factors are based on recent studies that show the conversion of provitamin A carotenoids to retinol is only half as great as previously thought.

In plant foods, such as spices and herbs, fruits, vegetables, legumes, nuts and cereal grains all of the vitamin A activity is contributed by provitamin A carotenoids. For these foods : g RAE were calculated by dividing the IU value by 20.

In foods of animal origin, such as eggs, beef, pork, poultry, lamb, veal, game and fish (except for some organ meats and dairy), all of the vitamin A activity is contributed by retinol. : g RAE and : g of retinol were calculated by dividing the IU value by 3.33.

In foods that contain both retinol and provitamin A carotenoids, the amount of these components must be known to calculate RAE. Most of the vitamin A data in the database were received as IU. Therefore the amounts of the provitamin A carotenoids and retinol had to be estimated based on the amount of retinol and provitamin A carotenoids in the ingredients. Once the components had been estimated, : g RAE was calculated as: (IU from carotenoids/20) plus (IU from retinol/3.33). : g of retinol was calculated as IU from retinol/3.33.

On NDL contracts we are specifying that analytical data be reported as :g of retinol and :g of individual carotenoids. This will make the calculation of any unit of vitamin A activity possible in the future.

We are continuing to report vitamin A in international units (IU), because it continues to be reported for nutrition labeling. One IU is equivalent to 0.3 :g retinol, 0.6 :g beta carotene, or 1.2 :g other provitamin-A carotenoids.

Currently, data on individual carotenoids are presented in a separate table (Holden et al 1999) available on the NDL web site. Plans are under way to add individual carotenoids to SR in future releases.

Vitamin D. Much of the data for vitamin D were published earlier (Weihrauch and Tamaki 1991). Values for breakfast cereals were updated based on data received from the representatives of food industry on fortification levels they used.

Vitamin E. Vitamin E was determined by gas-liquid chromatography (GLC) or high-performance liquid chromatography. Total vitamin E activity is reported as mg alpha-tocopherol equivalents and was calculated from the amounts and relative activities of the various tocopherols and tocotrienols. In this release, data are also presented on the individual tocopherols when available. In the future, we will be adding more data for alpha-tocopherol and dropping alpha-tocopherol equivalents to be in line with the new DRIs for vitamin E (NAS-IOM 2000).

Lipid Components. Fatty acids are expressed as the actual quantity of fatty acid in g per 100 g of food and do not represent fatty acids as triglycerides. Historically, most fatty acid data were obtained as the percentage of fatty acid methyl esters and determined by GLC analyses. These data were converted to g fatty acid per 100 g total lipid using lipid conversion factors and then to g fatty acid per 100 g edible portion of food using the total lipid content. Details of the derivation of lipid conversion factors were published by Weihrauch et al. 1977. In the redesigned NDBS, fatty acid data may be imported in a variety of units and converted within the system. No conversions are required if data are received as g fatty acid per 100 g edible portion of food. Data received as fatty acid esters and triglycerides are converted to fatty acids using Sheppard factors. Sheppard conversion factors are based on the differential molecular weights of the specific fatty acid and its corresponding esters (butyl or methyl) and triglyceride (Sheppard 1992). When fatty acid data are received as percentages of fatty acid methyl esters, methyl esters are converted to fatty acids using Sheppard factors and then multiplied by total lipid (Nutrient No. 204) to give g fatty acid per 100 g edible portion of food. Occasionally, total fat (Nutrient No. 204) values are available from a variety of data sources, but individual fatty acids are available from fewer references. In those cases, it may be necessary to normalize the individual fatty acids to the mean fat value of the food item. In the case of normalized fatty acids, the sum of the individual fatty acids will equal the mean fat value multiplied by the Weihrauch lipid conversion factor for that food item. No statistics of variability are reported for normalized fatty acids.

The basic format for describing individual fatty acids is that the number before the colon indicates the number of carbon atoms in the fatty acid chain; the number after the colon indicates the number of double bonds. For unsaturated fatty acids, additional nutrient numbers have been added to accommodate the reporting of many specific positional and geometric isomers. Of the specific isomers, there are two basic classifications considered: omega double bond position and *cis/trans* configuration of double bonds.

Omega-3 and omega-6 isomers are denoted in shorthand nomenclature as n-3 and n-6. The n–number indicates the position of the first double bond from the methyl end of the carbon chain. The letter *c* or *t* indicates whether the bond is *cis* or *trans*. For polyunsaturated fatty acids, *cis* and *trans* configurations at successive double bonds may be indicated. For example, linoleic acid is an 18 carbon omega-6 fatty acid with 2 double bonds, both in *cis* configuration. When data are isomer specific, linoleic acid is described as 18:2 n-6 c,c. Other isomers of 18:2, for which new nutrient numbers have been assigned, include 18:2 c,t, 18:2 t,c, and 18:2 t,t; 18:2 t not further defined and 18:2 i. 18:2 i is not a single isomer but includes isomers other than 18:2 n-6 c,c with peaks that cannot easily be differentiated in the particular food item. Systematic and common names for fatty acids are given in table 2.

Fatty acid totals: Only a small portion of the fatty acid data received for release in SR15 contains specific positional and geometric isomers. Therefore, it has been necessary to maintain the usual nutrient numbers corresponding to fatty acids with no further differentiation than carbon length and number of double bonds. To aid users of our data, specific isomers are always summed to provide a total value for the undifferentiated fatty acid. So, mean values for the specific isomers of 18:2 would be summed to provide a mean for 18:2 undifferentiated (Nutrient No. 618). Other fatty acid totals provided are: (1) the sum of saturated, monounsaturated, and polyunsaturated fatty acids and (2) the sum of trans-monoenoic, the sum of trans-polyenoic, and the sum of all trans fatty acids.

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. In rare cases, the sum of the individual fatty acids may exceed the sum of the values given for the total saturated fatty acids (SFA), monounsaturated fatty acids (MUFA), and polyunsaturated fatty acids (PUFA). These differences are generally caused by rounding and may be relatively small.

For formulated brand name 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 fatty acids of the individually listed ingredients and normalized to the total fat level. A best-fit approximation was made to fatty acid classes, but unavoidably, calculated sums of individual fatty acid totals did not always match industry data for fatty acid classes. Zero values for individual fatty acids should be understood to mean that trace amounts may be present. When g fatty acids per 100 g of total lipid were converted to g fatty acids per 100 g of food, values of less than 0.0005 were rounded to 0.

Table 2 is for the convenience of users in attaching common names or systematic names to fatty acids in our database. Although individual fatty acids are more specific than in past releases, it is not possible to include every possible geometric and positional isomer. Where specific isomers exist for a fatty acid, the common name of the most typical isomer is listed for the undifferentiated fatty acid and an asterisk (*) designates the specific isomer by that name. The most typical isomer for 18:1 is oleic. So, the specific isomer by that name, 18:1 c, is designated in table 2 as oleic.

Table 2. Systematic and common names for fatty acids †

Fatty acid	Systematic name	Common name of most typical isomer	Nutrient number
Saturated fatty acids			
4:0	butanoic	butyric	607
6:0	hexanoic	caproic	608
8:0	octanoic	caprylic	609
10:0	decanoic	capric	610
12:0	dodecanoic	lauric	611
13:0	tridecanoic		696
14:0	tetradecanoic	myristic	612
15:0	pentadecanoic		652
16:0	hexadecanoic	palmitic	613
17:0	heptadecanoic	margaric	653
18:0	octadecanoic	stearic	614
19:0	nonadecanoic		686
20:0	eicosanoic	arachidic	615
22:0	docosanoic	behenic	624
24:0	tetracosanoic	lignoceric	654
Monounsaturated fatty acids			
14:1	tetradecenoic	myristoleic	625
15:1	pentadecenoic		697
16:1 undifferentiated	hexadecenoic	palmitoleic	626
16:1 c			673*
16:1 t			662
17:1	heptadecenoic		687
18:1 undifferentiated	octadecenoic	oleic	617
18:1 c			674*
18:1 t			663
20:1	eicosenoic	gadoleic	628
22:1 undifferentiated	docosenoic	erucic	630
22:1 c			676*
22:1 t			664
24:1 c	cis-tetracosenoic	nervonic	671

Table 2. Systematic and common names for fatty acids (continued)

Fatty acid	Systematic name	Common name of most typical isomer	Nutrient number
Polyunsaturated fatty acids			
16:2 undifferentiated	hexadecadienoic	688	
18:2 undifferentiated	octadecadienoic	linoleic 618	
18:2 n-6 c,c			675*
18:2 c,t			668
18:2 t,c			667
18:2 t,t			669
18:2 i			666
18:2 t not further defined			665
18:3	octadecatrienoic	linolenic	619
18:3 n-3 c,c,c		alpha-linolenic	851*
18:3 n-6 c,c,c		gamma-linolenic	685
18:4 undifferentiated	octadecatetraenoic	parinaric	627
20:2 n-6 c,c	eicosadienoic		672
20:3 undifferentiated	eicosatrienoic		689
20:3 n-3			852*
20:3 n-6			853
20:4 undifferentiated	eicosatetraenoic	arachidonic	620
20:4 n-3			854
20:4 n-6			855*
20:5 n-3	eicosapentaenoic (EPA)	timnodonic	629
22:2	docosadienoic	brassic	698
22:5 n-3	docosapentaenoic (DPA)	clupanodonic	631
22:6 n-3	docosahexaenoic (DHA)		621

† For some fatty acids listed in the above table, there are no data in this release.
* Designates the specific isomer associated with the common name; the typical isomer is listed for the undifferentiated fatty acid.

Cholesterol. Cholesterol values were generated primarily by GLC procedures. It is assumed that cholesterol is present only in foods of animal origin and foods containing at least one ingredient of animal origin (for example, cake that contains eggs). For mixtures containing ingredients derived from animal products, the cholesterol value may have been calculated from the value for those ingredients. For foods that contain only plant products, the value for cholesterol is assumed to be zero.

Plant sterols. Data on plant sterols (campesterol, stigmasterol, $-sitosterol) were obtained by colorimetric or gas-chromatographic procedures and summed to calculate total phytosterols.

Amino Acids. Amino acid data for a class or species of food are aggregated to yield a set of values that serve as the pattern for calculating the amino acid profile of other similar foods. The amino acid values for the pattern are expressed on a per-gram-of-nitrogen basis. Data to develop amino acid patterns for simple foods were obtained primarily by ion-exchange chromatography. The amino acid patterns and the total nitrogen content were used to calculate the levels of individual amino acids per 100 g of food, using the following formula:

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

where

AA_f = amino acid content per 100 g food,
AA_n = amino acid content per g nitrogen,
V_p = protein content of food, and
N_f = nitrogen factor.

In the past, the number of data points appeared only on the food item for which the amino acid pattern was developed, not on other foods that used the same pattern. It referred to the number of observations used in developing the amino acid pattern for that food. For foods processed in the new NDBS, the number of observations used in developing an amino acid pattern will be released only with the pattern. The amino acid profiles calculated from these patterns will show the number of data points to be zero.

If amino acid values are presented for an item with more than one protein-containing ingredient, the 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-g basis were calculated as the sum of the amino acids in each protein-containing ingredient multiplied by total nitrogen in the item.

Weights and Measures

Information is provided on household measures for food items (for example, 1 cup, 1 tablespoon, 1 fruit, 1 leg). Weights are given for edible material without refuse. The Gram Weight file contains the gram weights and measure descriptions for each food item. This file can be used to calculate nutrient values for food portions from the values provided per 100 g of food. The formula used 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 g (Nutr_Val in the Nutrient Data file), and
W = g weight of portion (Gm_wt in the Gram Weight file).

The Gram Weight file can be used to produce reports showing the household measure and nutrient values calculated for that portion. The weights were derived from published sources, industry files, studies conducted by USDA (Adams 1975, Fulton et al. 1977), and the weights and measures used in USDA's Continuing Survey of Food Intakes by Individuals (USDA 1998). Though we made special efforts to provide representative values, weights and measures obtained from different sources vary considerably for some foods. Starting with SR14, we combined the Gram Weight file and the Measure Description file to make this information easier to use.

Footnotes

Footnotes are provided for a few items where information about food description, weights and measures, or nutrient values could not be accommodated in existing fields. Many of the footnotes published in Agriculture Handbook 8 are no longer needed because the information has been moved to other fields and tables. For example, details about the measure description, once contained in footnotes, are now part of the measure description in the Gram Weight file. Values for additional nutrients once included in footnotes were given nutrient numbers, when appropriate, and included in the Nutrient Data file. The database also incorporates data that cover enrichment or fortification or cases where nutrient content is affected by plant part or color (for example, yellow and white corn).

Sources of Data

We first added this file (previously called References) with SR14. We have changed the name and some of the fields to reflect the fact that not all sources are journals or books, but also include the results of unpublished data from USDA-sponsored research and from research sponsored by others either separately or in collaboration with USDA. It contains the data sources for the nutrient values and links to an identification number on each nutrient record. Since many of the data in this release were carried forward from SR13, nutrient-specific source documentation was not electronically available. But, as new data for these foods are generated and as additional documentation is entered into the new NDBS, data source information will increase in future releases. The format will change with the next SR to allow users to establish relationships between this file and the Nutrient Data file.

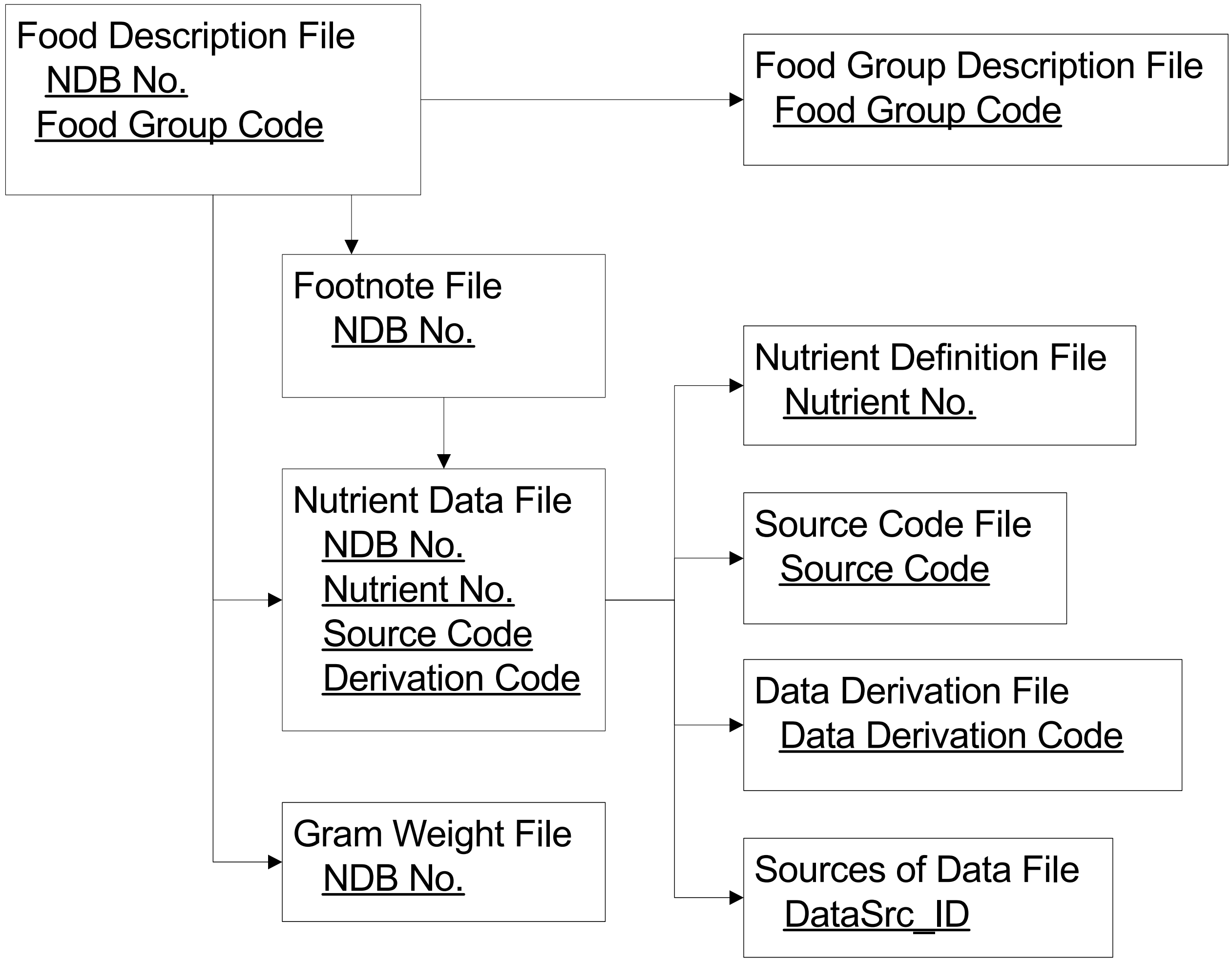
Explanation of File Formats

The data appear in two different organizational formats. One is a relational format of four principal and five support files making up the database (fig. 1). The relational format is complete and contains all food, nutrient, and related data. The other is a flat, abbreviated file with fewer nutrients and related information

Relational Files

The four principal and five support files of the relational database can be linked together in a variety of combinations to produce queries and generate reports. Table 3 shows the number of records in each file. The relational files are in both ASCII format and a Microsoft Access 2000 database. Tables 4–12 describe the formats of these files. Information on the various relationships that can be made among these files is also given. Fields that always contain data and fields that can be left blank or null are identified in the "blank" column; N indicates a field

Figure 1. Relationship among files in the USDA Nutrient Database for Standard Reference



that is always filled; Y indicates a field that may be left blank (null) (tables 4–12). An asterisk (*) indicates that the field is indexed. Although the files are not indexed, the file descriptions show where indexes were used to sort and manage records within the NDBS. When importing these files into a database management system, if files are to be indexed, it is important to use the indexes listed here, particularly with the Nutrient Data file, which uses two.

ASCII files are delimited. All fields are separated by carets (^) and text fields are surrounded by tildes (~). A double caret (^^) or two carets and and two tildes (~~) appear when a field is null or blank. Format descriptions include the name of each field, its type [N = numeric with width and number of decimals (w.d) and A = alphanumeric], and maximum length. The actual length in the data files may be less and most will likely change in later releases.

Table 3. Number of records in principal and support files.

File name	Table name	Number of records
Principal files		
Food Description	FOOD_DES	6,220
Nutrient Data	NUT_DATA	382,013
Gram Weight	WEIGHT	11,954
Footnote	FOOTNOTE	121
Support files		
Food Group Description	FD_GROUP	23
Nutrient Definition	NUTR_DEF	117
Source Code	SRC_CD	10
Data Derivation Description	DERIV_CD	48
Sources of Data	DATA_SRC	80

Food Description File (file name = FOOD_DES). The Food Description File (table 4) contains a long and short description and food group for 6,220 food items, along with common names, manufacturer name, scientific name, percentage of refuse, and factors used for calculating protein and calories, if applicable.

- Links to the Food Group Description file by the FdGrp_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.

Table 4. Food Description File Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank number that uniquely identifies a food item
FdGrp_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, we made additional abbreviations

ComName	A 100	Y	Other names commonly used to describe a food, for example "hot dog" for "frankfurter"
ManufacName	A 50	Y	Manufacturer's name for brand name foods
Survey	A 1	Y	Item used in the National Food and Nutrition Surveys
Ref_desc	A 45	Y	Description of inedible parts of a food item (refuse), such as seeds or bone
Refuse	N 2	Y	Percentage of refuse
SciName	A 60	Y	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). This file (table 5) is a support file to the Food Description file and contains a list of food groups used in SR15 and their descriptions.

C Links to the Food Description file by FdGp_Cd.

Table 5. Food Group Description File Format

Field name	**Type**	**Blank**	**Description**
FdGrp_Cd	A 4*	N	4-digit code identifying a food group. Only the first 2 digits are currently assigned. In the future, the last 2 digits may be used
FdGrp_Desc	A 60	N	Name of food group

Nutrient Data File (file name = NUT_DATA). The Nutrient Data file (table 6) contains the nutrient values and information about the values, including expanded statistical information.

C Links to the Food Description file by NDB_No
C Links to the Gram Weight file by NDB_No
C Links to the Footnote file by NDB_No and when applicable, Nutr_No
C Links to the Nutrient Definition file by Nutr_No
C Links to the Source Code file by Src_Cd.
C Links to the Derivation Code file by Deriv_Cd

Table 6. Nutrient Data File Format

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†
Num_Data_Pts	N 5.0	N	Number of data points (previously called Sample_Ct)
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
Deriv_Cd	A 4	Y	Data Derivation Code giving specific information on how the value was determined
Ref_NDB_No	A 5	Y	NDB number of the item used to impute a missing value. Populated only for items added or updated starting with SR14
Add_Nutr_Mark	A 1	Y	Indicates a vitamin or mineral added for fortification or enrichment. Not populated for this release
Num_Studies	N 2	Y	Number of studies
Min	N 10.3	Y	Minimum value
Max	N 10.3	Y	Maximum value
DF	N 2.0	Y	Degrees of Freedom
Low_EB	N 10.3	Y	Lower 95% error bound
Up_EB	N 10.3	Y	Upper 95% error bound
Stat_cmt	A 10	Y	Statistical comments. See definitions below.
CC	A 1	Y	Confidence Code indicating data quality, based on evaluation of sample plan, sample handling, analytical method, analytical quality control, and number of samples analyzed. Not populated for this release
DataSrc_ID	A 41	Y	Codes indicating the data sources

†Nutrient values have been rounded to a specified number of decimal places for each nutrient. Number of decimal places are listed in the Nutrient Definition file.

Definitions of each Statistical Comment included in the Nutrient Data table follow:

1. The displayed summary statistics were computed from data containing some less-than values. Less-than, trace, and not-detected values were calculated.
2. The displayed degrees of freedom were computed using Satterthwaite's approximation (Korz and Johnson, 1988)
3. The procedure used to estimate the reliability of the generic mean requires that the data associated with each study be a simple random sample from all the products associated with the given data source (for example, manufacturer, variety, cultivar, and species).
4. For this nutrient, one or more data sources had only one observation. Therefore, the standard errors, degrees of freedom, and error bounds were computed from the between-group standard deviation of the weighted groups having only one observation.

Nutrient Definition File (file name = NUTR_DEF). The Nutrient Definition file (table 7) is the support file to the Nutrient Data File. It provides the 3-digit nutrient code, unit of measure, INFOODS tagname, and description.

C Links to the Nutrient Data file by Nutr_No.

Table 7. Nutrient Definition File Format

Field name	Type	Blank	Description
Nutr_No	A 3*	N	3-digit unique identifier code for a nutrient
Units	A 7	N	Units of measure (mg, g, :g, and so on.)
Tagname	A 20	N	International Network of Food Data Systems (INFOODS) Tagnames.† A unique abbreviation for a food component developed by INFOODS to aid in the interchange of data
NutrDesc	A 60	N	Name of food component
Decimal	A 1	N	Number of decimal places that a nutrient value is rounded to

† Klensin et al. 1989.

Source Code File (file name = SRC_CD). The Source Code file (table 8) contains codes indicating the type of data (analytical, calculated, assumed zero, and so on) in the Nutrient Data file. To improve the usability of the database, NDL staff imputed nutrient values for many proximate components, total dietary fiber, and vitamin and mineral values.

C Links to the Nutrient Data file by Src_Cd.

Table 8. Source Code File Format

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

A description of each source code follows:

Source code	Description
1	Value is analytical or derived from the analytical
4	Value is imputed
5	Value on which a manufacturer based its label claim for added nutrients (used primarily for Breakfast Cereals and Infant Formulas)
7	Value is an assumed zero because, biologically, the nutrient could not be present (such as dietary fiber in animal products), or the nutrient is expected to be present in insignificant amounts (such as vitamin C in meat products)
8	Value is calculated from the nutrient label by Nutrient Data Lab
9	Value is calculated by the manufacturer, not adjusted or rounded for compliance to the Nutrition Labeling and Education Act
11	Aggregated data involving comb. of codes other then 1,12 or 6
12	Value is analytical, supplied by the manufacturer with partial documentation
13	Analytical data from the literature, partial documentation

Data Derivation Code Description File: (file name = DERIV_CD). This file (table 9) is a support file for the Nutrient Data file and contains information on how the nutrient values were determined. The file contains the derivation codes and their descriptions.

C Links to the Nutrient Data file by Deriv_Cd

Table 9. Data Derivation Code File Format

Field name	Type	Blank	Description
Deriv_Cd	A 4*	N	Derivation Code
Deriv_Desc	A 120	N	Description of derivation code giving specific information on how the value was determined

For example, the data derivation code that indicates how alpha-tocopherol (Nutrient No. 323) in Emu, fan fillet, raw (NDB. No. 05623) was calculated is BFSN. The breakdown of the code is as follows:

B = based on another form of the food or a similar food;
F = concentration adjustment used;
S = solids, the specific concentration adjustment used; and
N = retention factors not used.

The Reference_NDB_No is 05621 Emu, ground, raw. This means the analytical alpha-tocopherol value in the solids of emu, ground raw is used to calculate the alpha-tocopherol in the solids of emu, fan fillet, raw.

$N_t = (N_s \times S_s)/S_t$

where

N_t = the nutrient content of the target item

N_s = the nutrient content of the source item
For NDB No. 05621, alpha-tocopherol = 0.24 mg/100 g
S_s = the solids content of the source item, and
For NDB No. 05621, solids = 25.38 g/100 g
S_t = the solids content of the target item.
For NDB No. 05623, solids = 27.13 g/100 g

So, using this formula for the above example:
N_t = (0.24 x 25.38)/27.13 = 0.22 mg/100 g alpha-tocopherol in Emu, fan fillet, raw

Only items that were imputed in the new NDBS will have derivation codes and reference NDB numbers. Other items that were imputed by hand during the development of data derivation codes will have data derivation codes but the reference NDB number field will be blank.

Gram Weight File (file name = WEIGHT). The format for the Gram Weight file (table 10) was changed starting with SR14. The measure description is now a field in this file, eliminating the need for a separate Measure file.

- Links to Food Description file by NDB_No.
- Links to Nutrient Data file by NDB_No.

Table 10. Gram Weight File Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank number
Seq	N 2*	N	Sequence number
Amount	N 5.3	N	Unit modifier (for example, 1 in “1 cup”)
Msre_Desc	A 80	N	Description (for example, cup, diced, 1-inch pieces)
Gm_Wgt	N 7.1	N	Gram weight
Num_Data_Pts	N 3	Y	Number of data points
Std_Dev	N 7.3	Y	Standard deviation

Footnote File (file name = FOOTNOTE). This file (table 11) contains additional information about the food item, household weight, and nutrient value.

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

Table 11. Footnote File Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Data Bank number
Footnt_No	A 4*	N	Sequence number
Footnt_Typ	A 1	N	The type of footnote D = indicates a footnote adding information to the food description; M = indicates a footnote adding information to measure description; 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 footnote applies
Footnt_Txt	A 200	N	Footnote text

Sources of Data File (file name = DATA_SRC) This file (table 12) provides a citation to the DataSrc_ID in the Nutrient Data file.

Table 12. Sources of Data File Format

Field name	Type	Blank	Description
DataSrc_ ID	A 6*	N	A unique number identifying the reference/source
Authors	A 255	N	List of authors for a journal article or name of sponsoring organization for other documents
Title	A 255	N	Title of article or name of document, that is, a report from a company or trade association
Year	A 4	N	Year article or document was published
Journal	A 135	Y	The name of the journal in which the article was published
Vol_City	A 10	Y	Volume number for journal articles or books; city where sponsoring organization is located
Issue_State	A 5	Y	Issue number for journal article; State where the sponsoring organization is located
Start_Page	A 5	Y	Starting page number in document
End_Page	A 5	Y	Ending page number in document

Abbreviated File (file name = ABBREV) The abbreviated file is available in ASCII format and is also provided in a Microsoft Excel spreadsheet. The ASCII file (table 13) is in delimited format. Fields are separated by a caret (^). Text fields are surrounded by a tilde (~). Data refer to 100 g of the edible portion of the food item. Decimal points are included in the fields. Missing values are denoted by the null value of two consecutive carets (^^) or two carets and two tildes (~~). The file is sorted in ascending order by the NDB number. Two common measures are provided, which are the first two common measures in the Gram Weight file for each NDB Number.

This file is a flat file and is provided for those users who do not need a relational database. It contains the information in one record per food item and is suitable for importing into a spreadsheet. We have imported the data file into a Microsoft Excel 2000 spreadsheet for users of that package. Users of other software packages can either import the Microsfot Excel 2000 spreadsheet or the ASCII files. It contains less descriptive information and fewer nutrients and weights than the larger relational files. If additional information is needed, this file can be linked to the other files by the NDB_number.

Table 13. Abbreviated File Format

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†
Water	N 10.3	Water (g/100 g)
Energ_Kcal	N 10.3	Food energy (kcal/100 g)
Protein	N 10.3	Protein (g/100 g)
Tot_Lipid	N 10.3	Total lipid (fat)(g/100 g)
Carbohydrt	N 10.3	Carbohydrate, by difference (g/100 g)
Fiber_TD	N 10.3	Total dietary fiber (g/100 g)
Ash	N 10.3	Ash (g/100 g)
Calcium	N 10.3	Calcium (mg/100 g)
Phosphorus	N 10.3	Phosphorus (mg/100 g)
Iron	N 10.3	Iron (mg/100 g)
Sodium	N 10.3	Sodium (mg/100 g)
Potassium	N 10.3	Potassium (mg/100 g)
Magnesium	N 10.3	Magnesium (mg/100 g)
Zinc	N 10.3	Zinc (mg/100 g)
Copper	N 10.3	Copper (mg/100 g)
Manganese	N 10.3	Manganese (mg/100 g)
Selenium	N 10.3	Selenium (: g/100 g)
Vit_A	N 10.3	Vitamin A (IU/100 g)
Vit_E	N 10.3	Vitamin E (mg alpha-tocopherol equivalents)
Thiamin	N 10.3	Thiamin (mg/100 g)
Riboflavin	N 10.3	Riboflavin (mg/100 g)
Niacin	N 10.3	Niacin (mg/100 g)
Panto_acid	N 10.3	Pantothenic acid (mg/100 g)
Vit_B_6	N 10.3	Vitamin B_6 (mg/100 g)

Table 13. Abbreviated File Format **(continued)**

Field name	Type	Description
Folate	N 10.3	Folate (: g/100 g)
Vit_B_{12}	N 10.3	Vitamin B_{12} (: g/100 g)
Vit_C	N 10.3	Vitamin C (mg/100 g)
FA_Sat	N 10.3	Saturated fatty acid (g/100 g)
FA_Mono	N 10.3	Monounsaturated fatty acids (g/100 g)
FA_Poly	N 10.3	Polyunsaturated fatty acids (g/100 g)
Cholestrl	N 10.3	Cholesterol (mg/100 g)
GmWt_1	N 9.2	First household weight for this item from the Gram Weight file‡
GmWt_Desc1	A 120	Description of household weight number 1
GmWt_2	N 9.2	Second household weight for this item from the Gram Weight file‡
GmWt_Desc2	A 120	Description of household weight number 2
Refuse_Pct	N 2.0	Percent refuse§

*Index field for the Abbreviated file.
†For a 200-character description and other descriptive information, link to the Food Description file.
‡For the complete list and description of the measure, link to the Gram Weight file.
§For a description of refuse, link to the Food Description file.

Update Files. These update files provide changes made between Release 14 and Release 15. Update files in ASCII are provided for those users who reformatted previous releases for their systems and wish to do their own updates If you are using an earlier release, you will need to first obtain the update files for each release between that release and Release 14, to update your database to Release 14, and then use the update files for SR15. These updates are available on NDL's web site (http://www.nal.usda.gov/fnic/foodcomp). Added items are given in six files

C ADD_FOOD for descriptions of the new items,
C ADD_NUTR for the nutrient data,
C ADD_WGT for the gram weight data,
C ADD_FTNT for the Footnote file,
C ADD_NDEF for the Nutrient Definition file, and
C ADD_DERV for the Data Derivation Code Description file

These files are in the same formats as the Food Description file, the Nutrient Data file, Gram Weight file, Footnote file, the Nutrient Definition file, and the Data Derivation Code Description file.

Three files contain changes made since SR14. CHG_FOOD contains records with changes in the descriptive information for a food item. CHG_NUTR contains changes to the following fields: nutrient values, standard errors, number of data points, source code and data derivation code. CHG_WGT contains records with changes to the gram weights or measure information. If the values in any fields have changed, the entire record is included for that file. These files are in the same format as the Food Description, Nutrient Data, and Gram Weight files. The update files are provided in ASCII format.

Food items that were deleted from the database are given in the DEL_FOOD file (table 14). In some cases, nutrient values were removed. These records are in the DEL_NUTR file (table 15). DEL_WGT contains any gram weights that were removed. These records are in the same format as the WEIGHT file (table 10). DEL_NDEF contains any nutrients that were removed from the database. These records are in the same format as the NUTR_DEF file (table 7).

Update files in ASCII are also provided for the Abbreviated file. The CHG_ABBR file contains records for food items where a food description, household weight, refuse value, or nutrient value was added, changed, or deleted since SR14. This file is in the same format as the Abbreviated file. DEL_ABBR contains food items that were removed from the database; it is in the same format as DEL_FOOD. ADD_ABBR contains food items added since SR14; it is also in the same format as the Abbreviated file.

Table 14. Foods Deleted Format

Field name	Type	Blank	Description
NDB_No	A 5*	No	5-digit unique number identifying deleted item
Shrt_Desc	A 60	No	60-character abbreviated description of food item

Table 15. Nutrients Deleted Format

Field name	Type	Blank	Description
NDB_No	A 5*	No	5-digit unique number identifying the item that contains the deleted nutrient record
Nutr_No	A 3	No	Nutrient number of deleted record

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Appendix A. Abbreviations Used in 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
Baby food	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, 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, condiments	CONDMNT
Cooked	CKD
Cottonseed	CTTNSD
Cream	CRM
Creamed	CRMD
Dark	DK
Decorticated	DECORT
Dehydrated	DEHYD
Dessert, 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, 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
Nonfat dry milk	NFDM
Nonfat dry milk solids	NFDMS
Nonfat 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, 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
Variety, varieties	VAR
Vegetable, 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. Other Abbreviations

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