

**Composition of Foods
Raw, Processed, Prepared
USDA National Nutrient Database for Standard
Reference, Release 21**

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Introduction

The USDA National 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 21 (SR21), contains data on 7,412 food items and up to 140 food components. It replaces SR20 issued in September 2007.

Updated data have been published electronically on the USDA Nutrient Data Laboratory (NDL) website since 1992. SR21 includes composition 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8" (U.S. Department of Agriculture 1976–92), and its four supplements (U.S. Department of Agriculture 1990–93), which superseded the 1963 edition (Watt and Merrill, 1963). SR21 supersedes all previous releases, including the printed versions, in the event of any differences.

In July 2001, when NDL converted to a new version of its Nutrient Databank System (NDBS), formats were changed and fields added 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 may not have been updated through the complete system. Therefore, many of these new fields contain data only for those items that have been processed through the new NDBS and it will take a number of years before they are populated for most food items in the database.

Data have been compiled from published and unpublished sources. Published sources include the scientific literature. Unpublished data include those obtained from the food industry, other government agencies, and research conducted under contracts initiated by USDA's Agricultural Research Service (ARS). These analyses are currently conducted under the National Food and Nutrient Analysis Program (NFNAP), in cooperation with the National Cancer Institute and 16 other offices and institutes of the National Institutes of Health (Pehrsson et al., 2000). Data from the food industry represents the nutrient content of a specific food or food product at the time the data is sent to NDL. The values may change due to reformulations or other processing changes by individual companies between the time that SR is released and the next update of this database. Values in the database may be based on the results of laboratory analyses or calculated by using appropriate algorithms, factors, or recipes, as indicated by the source code in the Nutrient Data file. Not every food item contains a complete nutrient profile.

Specific Changes for SR21

The major changes to the database since the last release are listed below.

- Two hundred and sixteen new foods were added to the database using data generated by USDA through NFNAP or submitted by the food industry: 28 brand name soy milk items, 66 soy-based vegetarian items, 12 new breakfast cereals, 4 types of dark chocolate representing different cacao levels, spray (spritzer) salad dressing, reduced calorie honey

mustard dressing, several types of pie crusts, Dutch apple pie, frozen turkey dinner, rice bowl with chicken, pomegranate juice, fruit juice blend, refried beans, grass-fed bison, several rotisserie chicken items (wing, back, breast, drumstick, and thigh), and USDA commodity egg mix and meats. These can be found in the ADD_Food file (p. 32).

- As part of the American Indian/Alaska Native database, data for 6 Stellar sea lion items (meat and organs) were added.
- New pork “value cuts” were added. These are special cuts of individual lean muscles from the shoulder and leg. They are marketed as value-added cuts, expanding the number of pork cuts available in the market.
- The demand for grass-fed beef has increased in recent years partially due to consumer interest in the fat content of foods. This release of SR provides new data on strip steaks and ground beef derived from grass-fed beef.
- NDL has released Uniform Retail Meat Identity Standards (URMIS) identification numbers for 190 beef items and 44 pork items in SR-21. The URMIS number is located in the Common Name Field of the Food Description File, and appears along with the common names in applicable SR reports. The URMIS program is a consumer-oriented identification system which simplifies and standardizes the perplexing array of fresh meat cuts and their names. Over the years, URMIS has advanced as a tool for sales information and inventory control. Within the URMIS system identification for meat cuts, Universal Product Code (UPC) numbers have been assigned to every cut. The UPC bar code is used by retailers to electronically scan meat packages and provides the retailer with information to assist in merchandising meat more effectively. The UPC bar code includes the URMIS identification number within its 12 digit code; digits 3 through 6 represent the URMIS number for meat products (More information on the URMIS numbering system can be viewed at www.meattrack.com).
- Nutrient data were updated for cottage cheese, sour cream, infant formulas, canned blueberries, tart cherries, canned crab, farmed Atlantic salmon, pecan pie, pumpkin pie, crème-filled snack cakes, snack crackers, saltines, chocolate sandwich cookies, chocolate chip cookies, pie crust, beef pot pies, chicken pot pies, brand name soups, *trans* fatty acid values on selected fast food items, and several snack items. These can be found in the CHG_NUTR file (p. 33).
- In response to changes in the availability of beef products in retail stores, 266 beef items have been removed from the database. Most of the removed products were beef cuts with a ¼ inch fat trim. Beef cuts currently available in the retail market contain 1/8” or 0” of external trim fat.
- A number of dry soup mixes, no longer on the market, were also removed from the database. A complete list of all the deleted food items can be found in the DEL_FOOD file (p. 33).

Data Files

The data files for SR21 are available in ASCII format and as a Microsoft Access 2000 database. A description of each field in these files and the relationships between each begins on p. 20. The Access database contains all the SR21 files and relationships, with a few sample queries and reports. An abbreviated file (p. 30), with fewer nutrients (44) but all the food items is also included. A Microsoft Excel 2000 spreadsheet of this file is also provided. These database and spreadsheet files are generally compatible with later releases of the same software package or with other software packages released at the same time.

Database Reports

The data in SR21 are available as reports in two different presentations. The first presents items in SR21 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 SR21. Those reports are sorted either alphabetically 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 “U.S. Department of Agriculture Home and Garden Bulletin 72, Nutritive Value of Foods” (Gebhardt and Thomas, 2002).

The Adobe Reader is needed to see these files. There is a link from the NDL website to Adobe's website where it can be downloaded at no charge.

Database Content

The database consists of several sets of data: food descriptions, nutrients, weights and measures, footnotes, and sources of data. 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).

Food Descriptions

This file includes descriptive information about the food items. For more details on the Food Description file, see “Food Description File Formats” (p. 22). A full description (containing the name of the food with relevant characteristics, e.g., raw or cooked, enriched, color) and a short description (containing abbreviations) are provided. Abbreviations used in creating short descriptions are given in Appendix A. In creating the short description, the first word in the long description is not abbreviated. In addition, if the long description is 25 characters or less, the short description contains no abbreviations. Abbreviations used elsewhere are given in Appendix B. Brand names used in food descriptions are in upper case. Scientific names, common names, manufacturers' names, amounts of refuse, and refuse descriptions are provided where appropriate. The common name field includes alternative names for a product, e.g., soda or pop, for a carbonated beverage. In addition this field also includes URMIS identification numbers and USDA commodity codes as appropriate. The food group to which the food item belongs is also indicated. A code is also provided indicating if an item is used in the Food and Nutrient Database

for Dietary Surveys (FNDDS; USDA, ARS, 2008). 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 the manufacturer calculates protein and calories.

The refuse and refuse description fields contain amounts and descriptions of inedible material (for example, seeds, bone, and skin) for applicable foods. These amounts are expressed as a percentage of the total weight of the item as purchased, and they are 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 (Matthews and Garrison, 1975) and 456 (Adams, 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 external trim fat. Separable lean refers to muscle tissue that can be readily separated from fat, bone, and connective tissue in 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 by using the following formula:

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

where

Y = nutrient value per 1 pound as purchased, and

W_c = weight of cooked, edible meat.

Nutrients

The Nutrient Data file contains mean nutrient values per 100 g of the edible portion of food, along with fields to further describe the mean value. The following statistical attributes are provided to better describe the data:

- Nutrient value – the mean of the data values for a specific parameter. Nutrient values have been rounded to the number of decimal places for each nutrient as specified in the Nutrient Definition file (p. 25).
- Number of data points – the number of data points used to estimate the mean.

- Standard error – the standard error of the mean: a measure of variability of the mean value as a function of the number of data points.
- Number of studies—the number of analytical studies used to generate the mean. A study is a discrete research project conducted or reported for a specific food. 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 the range of values.
- Maximum value—the largest observed value in the range of values.
- Degrees of freedom—the number of data values that are free to vary after certain restrictions are placed on the estimates; used in probability calculations.
- Lower- and upper-error bounds—represent a range of values within which the population mean is expected to fall, given a pre-specified confidence level. For SR21 and related releases, the confidence level is 95 percent.
- Statistical comments—gives additional details about certain assumptions made during statistical calculations. The definition of each comment is given after the description of the Nutrient Data file under “File Formats” (p. 24).

Other fields provide information on how the values are generated, as follows:

- Derivation code—gives more information about how a value was calculated or imputed. Procedures used to impute a nutrient value are 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 for which an imputed value is provided.
- Added nutrient marker—a “Y” indicates that a mineral or vitamin was added for enrichment or fortification. This field is populated for ready-to-eat breakfast cereals and many brand-name hot cereals in food group 8. In future releases, this field will be populated for other food groups.
- Confidence code—indicates the relative quality of the data. This code is derived using the data quality criteria first described by Mangels et al. (1993). These criteria have been expanded and enhanced for the NDBS (Holden et al., 2002). This field is included as a placeholder for future releases.

For more details on the Nutrient Data file, see “Nutrient Data File Formats” (p. 24). Nutrient values indicate the total amount of the nutrient present in the edible portion of the food, including any nutrients added in processing. Table 1 gives an idea of the comprehensiveness of the database by listing for each nutrient the number of food items that contain data.

In general, levels of fortified nutrients are the values calculated by the manufacturer or by NDL, based on the Nutrition Labeling and Education Act (NLEA) label declaration of % Daily Value (DV) (CFR, Title 21, Pt. 101) (U.S. Food and Drug Administration–Department of Health and Human Services, 2004). Such values represent the minimum nutrient level expected in the product. If analytical values were used to estimate levels of added nutrients, a number is present in the sample count field for these nutrients.

Table 1.—Number of Foods in the Database (*n* = 7,412) Containing a Value for the Specified Nutrient

Nutr. No.	Nutrient	Number of foods	Nutr. No.	Nutrient	Number of foods
255	Water* †	7408	417	Folate, total* †	6351
208	Energy* †	7412	431	Folic acid* †	6027
203	Protein* †	7412	432	Food folate* †	6172
204	Total lipid (fat)* †	7412	435	Folate (DFE)* †	6020
205	Carbohydrate, by difference* †	7412	421	Choline, total * †	3563
207	Ash †	7406	454	Betaine	1435
291	Total dietary fiber* †	6690	418	Vitamin B ₁₂ * †	6431
269	Total sugars* †	5181	578	Added vitamin B ₁₂ *	3648
210	Sucrose	1007	320	Vitamin A (RAE)* †	6109
211	Glucose	1000	319	Retinol* †	5933
212	Fructose	994	321	β-carotene* †	4200
213	Lactose	979	322	α-carotene* †	4071
214	Maltose	964	334	β-cryptoxanthin* †	4059
287	Galactose	845	318	Vitamin A (IU) †	7087
209	Starch	618	337	Lycopene* †	4029
301	Calcium* †	7268	338	Lutein+zeaxanthin* †	4004
303	Iron* †	7287	323	α-tocopherol (vitamin E)* †	4282
304	Magnesium* †	6620	573	Added vitamin E*	3534
305	Phosphorus* †	6721	341	β-tocopherol	1156
306	Potassium* †	6890	342	γ-tocopherol	1153
307	Sodium* †	7328	343	δ-tocopherol	1135
309	Zinc* †	6663	324	Vitamin D	641
312	Copper*	6512	430	Vitamin K* †	3948
315	Manganese†	5750	606	Total saturated fatty acids* †	7092
317	Selenium* †	5927	607	4:0*	4380
313	Fluoride	508	608	6:0*	4403
401	Vitamin C, total ascorbic acid* †	7019	609	8:0*	4668
404	Thiamin* †	6689	610	10:0*	5165
405	Riboflavin* †	6711	611	12:0*	5459
406	Niacin* †	6684	696	13:0	223
410	Pantothenic acid†	5882	612	14:0*	5856
415	Vitamin B ₆ * †	6484	652	15:0	1222

*Indicates the 64 nutrients included in the USDA Food and Nutrient Database for Dietary Studies (FNDDS).

† Nutrients included in the Abbreviated file (p. 30).

Table 1.—Number of Foods in the Database (*n* = 7,412) Containing a Value for the Specified Nutrient—(continued)

Nutr. No.	Nutrient	Number of foods	Nutr. No.	Nutrient	Number of foods
613	16:0*	6078	852	20:3 n-3	99
653	17:0	1248	853	20:3 n-6	107
614	18:0*	6065	620	20:4 undifferentiated*	5171
615	20:0	1302	689	20:3 undifferentiated	1024
624	22:0	1216	852	20:3 n-3	99
654	24:0	693	833	20:3 n-6	107
645	Total monounsaturated fatty acids* †	6612	620	20:4 undifferentiated*	5171
			855	20:4 n-6	8
625	14:1	1233	629	20:5 n-3*	4544
697	15:1	938	857	21:5	94
626	16:1 undifferentiated*	5812	858	22:4	199
673	16:1 <i>cis</i>	171	631	22:5 n-3*	4489
662	16:1 <i>trans</i>	119	621	22:6 n-3*	4542
687	17:1	957	605	Fatty acids, total <i>trans</i>	1400
617	18:1 undifferentiated*	6099	693	Fatty acids, total <i>trans</i> -monoenoic	363
674	18:1 <i>cis</i>	413			
663	18:1 <i>trans</i>	425	695	Fatty acids, total <i>trans</i> -polyenoic	299
628	20:1*	5159			
630	22:1 undifferentiated*	4574	601	Cholesterol* †	7119
676	22:1 <i>cis</i>	140	636	Phytosterols	524
664	22:1 <i>trans</i>	100	638	Stigmasterol	72
671	24:1 <i>cis</i>	332	639	Campesterol	72
646	Total polyunsaturated fatty acids* †	6616	641	β-sitosterol	73
			501	Tryptophan	4423
618	18:2 undifferentiated*	6114	502	Threonine	4465
675	18:2 n-6 <i>cis, cis</i>	385	503	Isoleucine	4467
666	18:2 i (other isomers)	125	504	Leucine	4467
669	18:2 <i>trans, trans</i>	189	505	Lysine	4480
665	18:2 <i>trans</i> , not further defined	69	506	Methionine	4479
670	18:2 conjugated linoleic acid (CLAs)	107	507	Cystine	4411
			508	Phenylalanine	4463
619	18:3 undifferentiated*	6007	509	Tyrosine	4453
851	18:3 n-3 <i>cis, cis, cis</i>	618	510	Valine	4467
685	18:3 n-6 <i>cis, cis, cis</i>	596	511	Arginine	4453
856	18:3 i (other isomers)	35	512	Histidine	4460
627	18:4*	4385	513	Alanine	4406
672	20:2 n-6 <i>cis, cis</i>	1006	514	Aspartic acid	4409
689	20:3 undifferentiated	1024	515	Glutamic acid	4410

* Indicates the 64 nutrients included in the USDA Food and Nutrient Database for Dietary Studies (FNDDS).

† Nutrients included in the Abbreviated file (p. 30).

Table 1.—Number of Foods in the Database (*n* = 7,412) Containing a Value for the Specified Nutrient—(continued)

Nutr. No.	Nutrient	Number of foods	Nutr. No.	Nutrient	Number of foods
516	Glycine	4407	221	Alcohol*	4277
517	Proline	4395	262	Caffeine*	4024
518	Serine	4406	263	Theobromine*	4000
521	Hydroxyproline	742			

* Indicates the 64 nutrients included in the USDA Food and Nutrient Database for Dietary Studies (FNDDS).

† Nutrients included in the Abbreviated file (p. 30).

Nutrient Retention and Food Yield. When nutrient data for prepared or cooked products are unavailable or incomplete, nutrient values are calculated from comparable raw items or by recipe. When values are calculated in a recipe or from the raw item, appropriate nutrient retention (USDA, 2007) and food yield factors (Matthews and Garrison, 1975) 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, where appropriate, adjustments are made for fat and moisture gains and losses.

Nutrient retention factors are based on data from USDA research contracts, 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 or gain of moisture and the loss of nutrients due to heat or other food preparation methods:

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

Where

TR = true retention

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.

Proximates. The term proximate component refers to those macronutrients that include water (moisture), protein, total lipid (fat), total carbohydrate, and ash. To be included in the database, a nutrient profile must have values for the proximate components and at least one other nutrient.

Protein. The values for protein were calculated from the amount of total nitrogen (N) in the food, using the conversion factors recommended by Jones (1941) for most food items. The analytical methods used to determine the nitrogen content of foods are AOAC 968.06 (4.2.04) and 990.03 (combustion) and 991.20 (Kjeldahl) (AOAC, 2003). 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. When the protein content of a multi-ingredient food (e.g., beef stew) is calculated using the recipe program of the NDBS the specific nitrogen to protein conversion factors are applied at the ingredient level. Therefore, the

N-factor field will remain empty. When the manufacturer calculates protein the N-factor field will also be empty.

Protein values for chocolate, cocoa, coffee, mushrooms, and yeast were adjusted for nonprotein nitrogenous material (Merrill and Watt, 1973). 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 are used as ingredients, such as chocolate in chocolate milk or yeast in bread, only their protein nitrogen content was used to determine their contribution to the calculated 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 SR21; 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 in the database. The item calculated using the 6.25 factor is identified as “crude protein basis.”

Total Lipid. The total lipid (fat) content of most foods is 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 No. 204. It is sometimes referred to as “crude fat” and includes the weight of all lipid components, including glycerol, soluble in the solvent system. Nutrient No. 204 may not be identical to the fat level declared on food labels under the NLEA, where fat is expressed as the amount of triglyceride that would produce the analytically determined amount of lipid fatty acids and does not include other lipid components not soluble in the solvent system. The term “NLEA fat” is commonly referred to as “total fatty acids expressed as triglycerides.”

Carbohydrate. Carbohydrate, when present, is 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. Carbohydrate in beer and wine is determined by methods 979.06 (27.1.21) and 985.10 (28.1.18) of AOAC International (AOAC 2003), respectively. Total dietary fiber content is determined by enzymatic-gravimetric methods 985.29 and 991.43 of the AOAC (2003). Total sugars is the term used for the sum of the individual monosaccharides (galactose, glucose, and fructose) and disaccharides (sucrose, lactose, and maltose). Analytical data for individual sugars are determined using AOAC methods (2003), either high-performance liquid chromatography (HPLC) or gas-liquid chromatography (GLC). When analytical data for total sugars are unavailable for items in the FNDDS, values are imputed or obtained from manufacturers and trade associations. Starch is analyzed using the AOAC method 966.11 (2003). Because the analyses of total dietary fiber, total sugars, and starch are

performed separately and reflect the analytical variability inherent to the measurement process, the sum of these carbohydrate fractions may not equal the carbohydrate-by-difference value.

Food Energy. Food energy is expressed in kilocalories (kcal) and kilojoules (kJ). One kcal equals 4.184 kJ. The data represent 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 multi-ingredient processed foods, are based on the Atwater system for determining energy values. Derivation of the Atwater calorie factors is discussed in “Agriculture Handbook 74” (Merrill and Watt, 1973). For multi-ingredient processed foods, calorie values (source codes 8 or 9; for more information on source codes, see p. 26) generally reflect industry practices (as permitted by NLEA) of calculating calories as 4, 4, or 9 calories per gram of protein, carbohydrate, and fat, respectively, or as 4, 4, or 9 calories per gram 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, a factor of 6.93 is used to calculate calories per gram of alcohol (Merrill and Watt, 1973). 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 multi-ingredient processed 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, are derived from the work of Livesay and Marinos (1988). Calorie factors for coffee and tea are estimated from those for seeds and vegetables, respectively.

Minerals. Minerals included in the database are calcium, iron, magnesium, phosphorus, potassium, sodium, zinc, copper, manganese, selenium, and fluoride. Levels of minerals for most foods are determined by methods of the AOAC (2003). Calcium, iron, magnesium, phosphorus, sodium, potassium, zinc, copper, and manganese are usually determined by atomic absorption (AOAC 985.35) and inductively coupled plasma emission spectrophotometry (AOAC 984.27).

Analytical data for selenium were published earlier by USDA (1992) and were determined by the modified selenium hydride and fluorometric methods. Selenium values for foods analyzed between 1998 and 2008 for NFNAP are determined by either the modified selenium hydride (AOAC 986.15) or stable isotope dilution gas chromatography-mass spectrometry (Reamer and Veillon, 1981) 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 the plants grow, that is, by their geographical origin (Kubota and Allaway, 1972). The values given are national averages and should be used with caution when levels of selenium in locally grown foods are of interest or concern.

Values for fluoride, previously released in the USDA National Fluoride Database of Selected Beverages and Foods, Release 2 (USDA, 2005), have been incorporated into SR21, but other analyzed values, including regional values, are not included in SR. Samples are analyzed using a fluoride ion-specific electrode, direct read method (VanWinkle, 1995) for clear liquids and a

micro-diffusion method (VanWinkle, 1995) for other food samples. As with selenium, the values for fluoride are national averages and should be used with caution when levels of fluoride in locally produced foods and beverages are of interest or concern.

Vitamins. Vitamins included in the database are ascorbic acid (vitamin C), thiamin, riboflavin, niacin, pantothenic acid, vitamin B₆, vitamin B₁₂, folate, total choline and betaine, vitamin A, vitamin E (α -tocopherol), vitamin K (phylloquinone), and vitamin D.

Ascorbic acid. In the current database system, all data for ascorbic acid are listed under Nutrient No. 401, total ascorbic acid, determined by the fluorometric method (AOAC 967.22). Older values which have not been updated are primarily for reduced ascorbic acid and were determined by the dichloroindophenol method (AOAC 967.21)

Thiamin, Riboflavin, and Niacin. Thiamin is determined chemically by the fluorometric method (AOAC 942.23). Fluorometric (AOAC 970.65) or microbiological (AOAC 940.33) methods are used to measure riboflavin. Niacin is determined by microbiological methods (AOAC 944.13). 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 (the mean value of 60 mg tryptophan is considered equivalent to 1 mg niacin (IOM, 1998)). Although not included in SR, niacin equivalents can be estimated for those foods where amino acids are given:

$$\text{mg Niacin equivalents} = \text{mg niacin} + (\text{mg tryptophan} / 60)$$

Pantothenic acid, Vitamins B₆, and B₁₂. Pantothenic acid (AOAC 945.74 or 992.07), vitamin B₆ (AOAC 961.15), and vitamin B₁₂ (AOAC 952.20) are determined by microbiological methods. Vitamin B₁₂ is found in foods of animal origin or those containing some ingredient of animal origin, e.g., cake that contains eggs or milk. For foods that contain only plant products, the value for vitamin B₁₂ is assumed to be zero. Some reports contain values for vitamin B₁₂ in certain fermented foods (soy sauce and miso). While it is believed that this B₁₂ 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 B₁₂ (Liem et al., 1977) and these values are not included in the database.

The Dietary Reference Intakes (DRI) report on vitamin B₁₂ recommended that people older than 50 years meet their Recommended Dietary Allowances (RDA) mainly by consuming foods fortified with vitamin B₁₂ or a vitamin B₁₂-containing supplement (IOM, 1998). Since vitamin B₁₂ added as a fortificant may provide a significant source of the vitamin in the diet, a nutrient number (#578) for “added vitamin B₁₂” has been added to the database. In this release, there are about 260 foods fortified with vitamin B₁₂. The vast majority are breakfast cereals, infant formulas, and plant-based meat substitutes. For these foods, the value for total vitamin B₁₂ is used for “added vitamin B₁₂.” Only a few cereals containing a milk ingredient would contain any intrinsic vitamin B₁₂. Milk-based infant formulas should contain intrinsic vitamin B₁₂. However, infants are not the population of concern for intake of fortified vitamin B₁₂. Plant-based meat substitutes should not contain intrinsic vitamin B₁₂.

Folate. Values are reported for folic acid (Nutrient No. 431), food folate (Nutrient No. 432), and total folate reported in μg (Nutrient No. 417) and as dietary folate equivalents (DFEs) (Nutrient No. 435). These varied folate forms are included and defined as described in the DRI report on folate (IOM, 1998). RDAs for folate are expressed in DFEs, which take into account the greater bioavailability of synthetic folic acid compared with naturally occurring food folate.

To calculate DFEs for any single food, it is necessary to have separate values for naturally occurring food folate and added synthetic folic acid in that item.

$$\mu\text{g DFE} = \mu\text{g food folate} + (1.7 * \mu\text{g folic acid})$$

Folate values for foods analyzed through NFNAP are generated using the trienzyme microbiological procedure (Martin et al., 1990). Microbiological methods measure μg total folate; for enriched foods, folic acid and food folate are not distinguished from each other. Therefore, to be able to calculate DFE, multi-ingredient enriched foods are analyzed by an additional microbiological procedure without enzymes to estimate the amount of added folic acid (Chun et al., 2006). Food folate is then calculated by difference.

The addition of folic acid to enriched cereal-grain products subject to standards of identity began in the United States on January 1, 1998 (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 unenriched foods, food folate would be equivalent to total folate since folic acid (pteroylmonoglutamic acid) occurs rarely in foods. Therefore, the same value with its number of data points and standard error, if present, is used for total folate and food folate. The folic acid value is assumed to be zero.

For enriched cereal-grain products with standards of identity (flour, cornmeal and grits, farina, rice, macaroni, noodles, bread, rolls, and buns), the folic acid value is calculated by subtracting the analytical folate value before fortification from the analytical value for the fortified product.

Enriched ready-to-eat (RTE) cereals have generally included folic acid fortification for over 25 years. Therefore, food folate values (before fortification) were not readily available for these products. Food folate was estimated by means of the NDBS 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. Generally, food folate values represent a small proportion of the total folate in the fortified products.

Choline. Beginning with SR19, total choline and betaine values from the USDA Database for the Choline Content of Common Foods (USDA, 2004) have been incorporated into SR. Values for the individual metabolites have not been added to SR, but are available in the USDA Database for the Choline Content of Common Foods.

For analysis, choline compounds are extracted, partitioned into organic and aqueous phases using methanol and chloroform, and analyzed directly by liquid chromatography-electrospray ionization-isotope dilution mass spectrometry (LC-ESI-IDMS) (Koc et al., 2002). Samples are analyzed for betaine and these choline-contributing compounds: free choline (Cho), glycerophosphocholine (GPC), phosphocholine (Pcho), phosphatidylcholine (Ptdcho), and sphingomyelin (SM).

Because there are metabolic pathways for the interconversion of Cho, GPC, Pcho, PtdCho, and SM (Zeisel et al., 1994), total choline content is calculated as the sum of these choline-contributing metabolites. Betaine values are not included in the calculation of total choline since the conversion of choline to betaine is irreversible (Zeisel et al., 2003).

Vitamin A. Beginning with SR15 (2002) values for vitamin A in μg of retinol activity equivalents (RAEs) and μg of retinol are reported. At the same time, values in μg of retinol equivalents (REs) were dropped from the database.

This change responds to new reference values for vitamin A in the DRI report issued by the Institute of Medicine of the National Academies (IOM, 2001). The report recommended changing the factors used for calculating vitamin A activity from the individual provitamin A carotenoids and introduced RAE as a new unit for expressing vitamin A activity. One μg RAE is equivalent to 1 μg of all-*trans*-retinol, 12 μg of all-*trans*- β -carotene, or 24 μg of other provitamin A carotenoids. The RAE conversion factors are based on recent studies that show that the conversion of provitamin A carotenoids to retinol is only half as great as previously thought.

Vitamin A is also reported in international units (IU), and will continue to be reported because it is still the unit used for nutrition labeling in the U.S. One IU is equivalent to 0.3 μg retinol, 0.6 μg β -carotene, or 1.2 μg other provitamin-A carotenoids (NAS/NRC, 1989) and thus over-estimates bioavailability.

Individual carotenoids (β -carotene, α -carotene, β -cryptoxanthin, lycopene, and lutein+zeaxanthin) are reported. The analytical data are from NFNAP, generated using HPLC methodology (AOAC 941.15) and from the scientific literature. Most analytical systems do not separate lutein and zeaxanthin, so these carotenoids are shown combined. These values supersede those in Holden et al., 1999. Vitamin A activity values in RAE and IU were calculated from the content of individual carotenoids (β -carotene, α -carotene, and β -cryptoxanthin) using the appropriate factors. For food items used in the FNDDS, carotenoid values are imputed if analytical data are not available. For many of these items data are only available for vitamin A in IU. The variability in carotenoid levels due to cultivar, season, growing area, etc., as well as rounding within the NDBS, increases the difficulty in matching the calculated vitamin A activity values from imputed individual carotenoids to the existing IU values. As a result, the vitamin A IU value agrees within ± 15 IU of the value calculated from individual carotenoids.

When individual carotenoids are not reported for plant foods (such as fruits, vegetables, legumes, nuts, cereal grains, and spices and herbs), μg RAE are 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. For these foods, where analytical data are not available, μg RAE and μg of retinol are calculated by dividing the IU value by 3.33.

In foods that contain both retinol and provitamin A carotenoids, the amount of each of these components must be known to calculate RAE. Previously, most of the vitamin A data in the database were received as IU. Therefore, the amounts of the provitamin A carotenoids and retinol were then estimated from the ingredients. Once the components had been estimated, μg RAE were calculated as $(\text{IU from carotenoids}/20) + (\text{IU from retinol}/3.33)$. Micrograms of retinol were calculated as $\text{IU from retinol}/3.33$.

Vitamin E. Vitamin E activity for the RDA as defined by the DRI report (IOM, 2000) is now limited to the naturally occurring form and three synthetic forms of α -tocopherol. For this reason, α -tocopherol equivalents, which included vitamin E activity from α -, β -, γ -, and δ -tocopherols and α -, β -, and γ -tocotrienols, were dropped from the database in SR16. Tocopherols are determined by gas-liquid chromatography (GLC) or high-performance liquid chromatography (HPLC) (Lee et al., 1999). For those items in FNDDS, values are presented for α -tocopherol. If analytical data are unavailable, values for α -tocopherol are imputed. When available, values are also presented for the other tocopherols.

In the DRI report for Vitamin E, different factors are recommended to be used to calculate the milligram amount of α -tocopherol from IUs of vitamin E (IOM, 2000). The factors vary depending upon the chemical form of α -tocopherol used to fortify the food where

mg of α -tocopherol in food, fortified food, or multivitamin

= IU of the RRR- α -tocopherol compound \times 0.67 and

= IU of the *all rac*- α -tocopherol compound \times 0.45.

Before SR16-1, the conversion factor for RRR- α -tocopherol was used for all vitamin E fortified foods. New α -tocopherol values have been calculated for breakfast cereals, most infant formulas and a few other foods that are fortified with vitamin E, where NDH confirmed that all *rac*- α -tocopherol is the form added. For more information about vitamin E in breakfast cereals, see the article in the January 2004 issue of the *American Journal of Clinical Nutrition* by Leonard et al. (2004).

The basis of the vitamin E tolerable upper intake level (UL), another reference value in the DRI report, was established using all forms of supplemental α -tocopherol (IOM, 2000). Although the 2*S*-stereoisomers do not contribute to vitamin E activity for the RDA (IOM, 2000), they do contribute to the UL. A new nutrient number (#573) has been added to identify quantities of “added vitamin E.” In this release, there are about 125 food items that have values for added vitamin E greater than 0. For the majority of these food items the form added is synthetic vitamin E (all *rac*- α -tocopherol). To relate intakes of supplemental α -tocopherol to the UL, values for “added vitamin E” should be multiplied by 2 when the added form is synthetic vitamin E. Items that are fortified with RRR- α -tocopherol (natural vitamin E) are identified by a footnote and the

added vitamin E can be used directly to estimate its contribution to the UL. The majority of foods that are fortified with vitamin E are infant formulas and breakfast cereals. For these foods, the value for total vitamin E is also used for “added vitamin E”; the small amount of intrinsic vitamin E is not considered. In fortified peanut butter, the intrinsic vitamin E is calculated since it is a substantial amount.

Vitamin K. Much of the data for vitamin K has been generated under NFNAP and supersedes the values in the USDA Provisional Table (PT-104) (Weihrauch and Chatra, 1994). Vitamin K is extracted with hexane, purified with solid phase extraction using silica columns, and quantitated using HPLC with chemical reduction and fluorescence detection. Losses are corrected using vitamin K₁₍₂₅₎ as the internal standard (Booth et al. 1994).

Vitamin D. Much of the data for vitamin D was published earlier in USDA’s Provisional Table (PT-108) (Weihrauch and Tamaki, 1991). Values for breakfast cereals have been updated based on data received from the food industry; values for other food items are updated using data generated under NFNAP using liquid chromatography (AOAC 995.05 or 982.29). These new values supersede those in PT-108.

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 (AOAC 996.06). 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 as triglycerides are converted to fatty acids using Sheppard conversion factors. Sheppard conversion factors are based on the 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 conversion factors and then multiplied by total lipid (Nutrient No. 204) to give g fatty acid per 100 g edible portion of food. Occasionally, total lipid values are available from a variety of data sources, but individual fatty acids are available from fewer sources. 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 (1977) lipid conversion factor for that food item. No statistics of variability are reported for normalized fatty acids.

Individual 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, and 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 (n-3) and omega-6 (n-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 nutrient numbers have now been assigned, include 18:2 *c,t*; 18:2 *t,c*; 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 be easily differentiated in the particular food item. Systematic and common names for fatty acids are given in Table 2.

Table 2 is provided for the convenience of users in attaching common names or systematic names to fatty acids in this database. Though 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. For example, the most typical isomer for 18:1 is oleic. Thus, 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
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

Table 2.—Systematic and Common Names for Fatty Acids—(continued)

Fatty acid	Systematic name	Common name of most typical isomer	Nutrient number
16:1 undifferentiated	hexadecenoic	palmitoleic	626
16:1 <i>cis</i>			673*
16:1 <i>trans</i>			662
17:1	heptadecenoic		687
18:1 undifferentiated	octadecenoic	oleic	617
18:1 <i>cis</i>			674*
18:1 <i>trans</i>			663
20:1	eicosenoic	gadoleic	628
22:1 undifferentiated	docosenoic	erucic	630
22:1 <i>cis</i>			676*
22:1 <i>trans</i>			664
24:1 <i>cis</i>	cis-tetracosenoic	nervonic	671
Polyunsaturated fatty acids			
18:2 undifferentiated	octadecadienoic	linoleic	618
18:2 <i>trans</i> not further defined			665
18:2 <i>trans</i> (other isomers)			666
18:2 n-6 <i>cis, cis</i>			675*
18:2 <i>trans</i>			666
18:2 <i>trans, trans</i>			669
18:2 conjugated linoleic acid (CLAs)			670
18:3 undifferentiated	octadecatrienoic	linolenic	619
18:3 n-3 <i>cis, cis, cis</i>		alpha-linolenic	851*
18:3 n-6 <i>cis, cis, cis</i>		gamma-linolenic	685
18:3 <i>trans</i> (other isomers)			856
18:4	octadecatetraenoic	parinaric	627
20:2 n-6 <i>cis, cis</i>	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-6			855
20:5 n-3	eicosapentaenoic (EPA)	timnodonic	629
21:5			857
22:4			858
22:5 n-3	docosapentaenoic (DPA)	clupanodonic	631
22:6 n-3	docosahexaenoic (DHA)		621

* Designates the specific isomer associated with the common name; the typical isomer is listed for the undifferentiated fatty acid.

Fatty acid totals. Only a small portion of the fatty acid data received for release in SR21 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 other 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. Thus, 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 should be relatively small.

For multi-ingredient processed brand-name foods, industry data are often available for fatty acid classes (SFA, MUFA, and PUFA) but are lacking for individual fatty acids. In these cases, individual fatty acids are calculated from the fatty acids of the individually listed ingredients and normalized to the total fat level. A best-fit approximation has been made to fatty acid classes, but unavoidably, calculated sums of individual fatty acid totals do 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 are converted to g fatty acids per 100 g of food, values of less than 0.0005 are rounded to 0.

Cholesterol. Cholesterol values are generated primarily by gas liquid chromatographic procedures (AOAC 994.10). 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 be 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, and β -sitosterol) are obtained by gas-chromatographic procedures (AOAC 967.18) 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. Amino acids are extracted in three groups—tryptophan, sulfur-containing amino acids (methionine and cystine), and all others. Tryptophan is determined by alkaline hydrolysis/HPLC (AOAC 988.15), methionine and cystine by performic oxidation/HPLC (AOAC 994.12) and all others by acid hydrolysis/HPLC (AOAC 982.30). The amino acid patterns and the total nitrogen content are 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 of food,

AA_n = amino acid content per g of nitrogen,

V_p = protein content of food, and

N_f = nitrogen factor.

For foods processed in the NDBS since SR14 (2001), 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. In the past, the number of data points appeared only for 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.

If amino acid values are presented for an item with more than one protein-containing ingredient, the values may be 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 are calculated as the sum of the amino acids in each protein-containing ingredient

multiplied by total nitrogen in the item. The number of data points for these values are given as zero.

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, that is, the weight of an apple without the core or stem, or a chicken leg without the bone, and so forth. The 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 following formula is used to calculate the nutrient content per household measure:

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

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_Wgt in the Weight file).

The Weight file can be used to produce reports showing the household measure and nutrient values calculated for that portion. The weights are derived from published sources, industry files, studies conducted by USDA (Adams, 1975; Fulton et al., 1977), and the weights and measures used in the FNDDS (2006). Though special efforts have been made to provide representative values, weights and measures obtained from different sources vary considerably for some foods. The format of this file is described on p. 27.

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. For example, if citric acid is added to a juice drink, this is indicated in the footnote. The format of this file is described on p. 28.

Sources of Data

The Sources of Data file (previously called References) was first added with SR14 (2001). The name of the file and fields reflect the fact that not all sources are journals or published literature, 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 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 (1999), nutrient-specific source documentation is not electronically available. 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 of this file is described on p. 29.

A file, the Sources of Data Link file, is provided to allow users to establish a relationship between the Sources of Data file and the Nutrient Data file. This lets the user identify specific sources of data for each nutrient value. For example, the user can use these files to identify where NFNAP data is used in the database. The format of this file is described on p.29.

Explanation of File Formats

The data appear in two different organizational formats. One is a relational format of four principal and six support files making up the database. The relational format is complete and contains all food, nutrient, and related data. The other is a flat abbreviated file with all the food items, but fewer nutrients, and not all of the other related information. The abbreviated file does not include values for starch, fluoride, betaine, added vitamin E, added vitamin B₁₂, alcohol, caffeine, theobromine, vitamin D, phytosterols, individual amino acids, fatty acids, or sugars. See p. 30 for more information on this file.

Relational Files

The four principal database files are the Food Description file, Nutrient Data file, Gram Weight file, and Footnote file. The six support files are the Nutrient Definition file, Food Group Description file, Source Code file, Data Derivation Code Description file, Sources of Data file, and Sources of Data Link file. Table 3 shows the number of records in each file. In a relational database, these files can be linked together in a variety of combinations to produce queries and generate reports. Figure 1 provides a diagram of the relationships between files and their key fields.

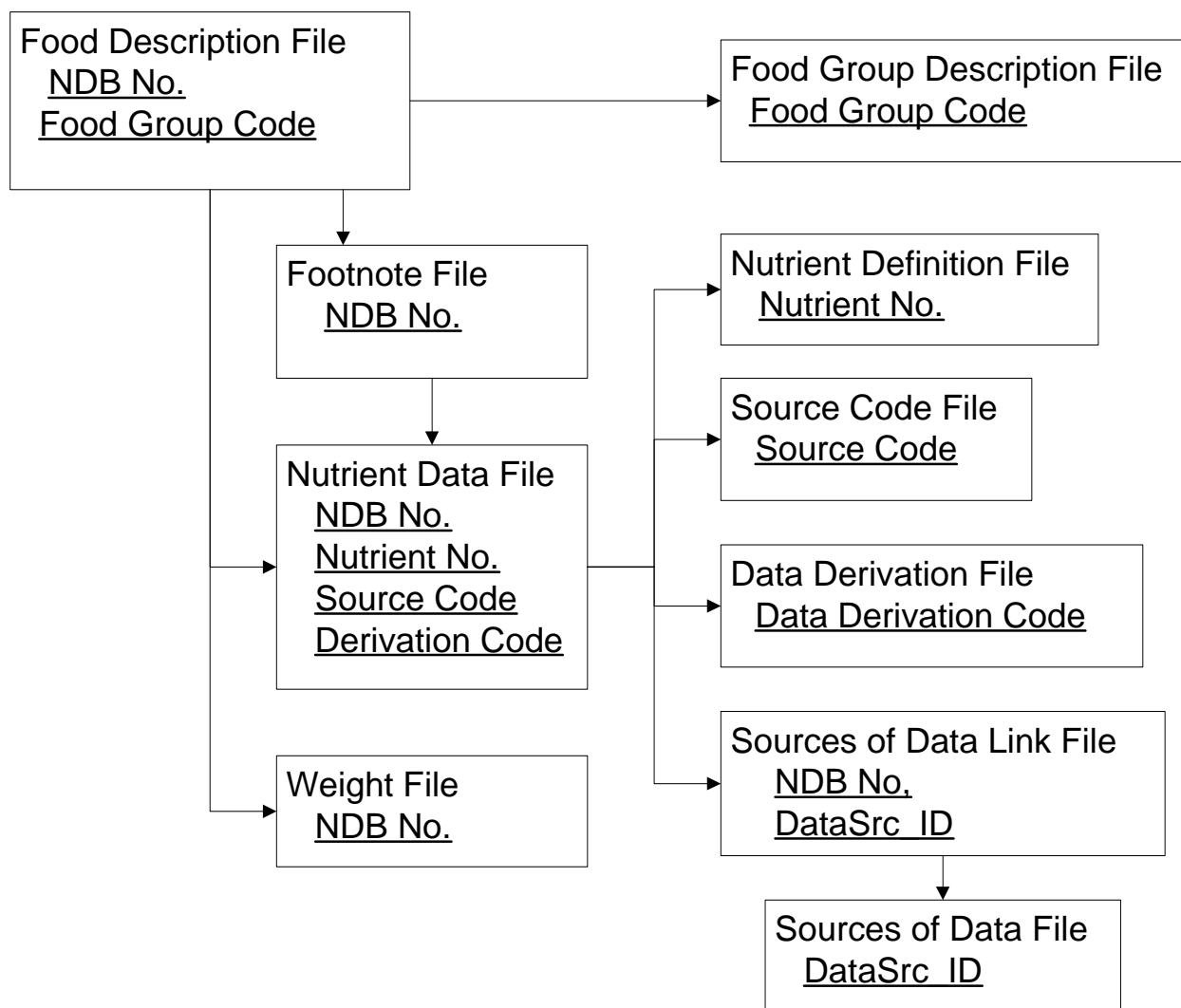
Table 3.—Number of Records in Principal and Support Files

File name	Table name	Number of records
Principal files		
Food Description	FOOD_DES	7,412
Nutrient Data	NUT_DATA	509,430
Weight	WEIGHT	13,087
Footnote	FOOTNOTE	309
Support files		
Food Group Description	FD_GROUP	24
Nutrient Definition	NUTR_DEF	140
Source Code	SRC_CD	10
Data Derivation Description	DERIV_CD	54
Sources of Data	DATA_SRC	491
Sources of Data Link	DATSRCLN	131,255

The relational files are provided in both ASCII format and a Microsoft Access 2000 database. Tables 4 through 13 describe the formats of these files. Information on the 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 that is always filled; Y indicates a field that may be left blank (null) (Tables 4–13). An asterisk (*) indicates primary key(s) for the file. Though keys are not identified for the ASCII files, the file descriptions show where keys are used to sort and manage records within the NDBS. When importing these files into a database management system, if keys are to be identified for the files, it is important to use the keys 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 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) or A = alphanumeric], and maximum record length. The actual length in the data files may be less and most likely will change in later releases. Values will be padded with zeroes when imported into various software packages, depending on the formats used.

Figure 1. Relationships among files in the USDA National Nutrient Database for Standard Reference *



* Underlined items denote key fields.

Food Description File (file name = FOOD_DES). This file (Table 4) contains long and short descriptions and food group designators for 7,412 food items, along with common names, manufacturer name, scientific name, percentage and description of refuse, and factors used for calculating protein and calories, if applicable. Items used in the FNDDS are also identified by value of “Y” in the Survey field.

- 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 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 Databank number that uniquely identifies a food item
FdGrp_Cd	A 4	N	4-digit code indicating food group to which a food item belongs
Long_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 is longer than 60 characters, additional abbreviations are made.
ComName	A 100	Y	Other names commonly used to describe a food, including local or regional names for various foods, for example, “soda” or “pop” for “carbonated beverages”
ManufacName	A 65	Y	Indicates the company that manufactured the product, when appropriate
Survey	A 1	Y	Indicates if the food item is used in the USDA Food and Nutrient Database for Dietary Studies (FNDDS) and has a complete nutrient profile for a specified set of nutrients
Ref_desc	A 135	Y	Description of inedible parts of a food item (refuse), such as seeds or bone
Refuse	N 2	Y	Percentage of refuse
SciName	A 65	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 (see p. 8)
Pro_Factor	N 4.2	Y	Factor for calculating calories from protein (see p. 10)
Fat_Factor	N 4.2	Y	Factor for calculating calories from fat (see p. 10)
CHO_Factor	N 4.2	Y	Factor for calculating calories from carbohydrate (see p. 10)

* Primary key for the Food Description file.

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 SR21 and their descriptions.

- Links to the Food Description file by FdGrp_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. Codes may not be consecutive.
FdGrp_Desc	A 60	N	Name of food group

* Primary key for the Food Group Description file.

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

- Links to the Food Description file by NDB_No.
- Links to the Weight file by NDB_No.
- Links to the Footnote file by NDB_No and when applicable, Nutr_No.
- Links to the Nutrient Definition file by Nutr_No.
- Links to the Source Code file by Src_Cd
- 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 Databank number
Nutr_No	A 3*	N	Unique 3-digit 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 can 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 is 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. This field is populated for ready-to-eat breakfast cereals and many brand-name hot cereals in food group 8
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	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 included in this release, but is planned for future releases

* Primary keys for the Nutrient Data file.

† Nutrient values have been rounded to a specified number of decimal places for each nutrient. Number of decimal places is 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). This 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.

- 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	Unique 3-digit identifier code for a nutrient
Units	A 7	N	Units of measure (mg, g, µg, and so on)
Tagname	A 20	Y	International Network of Food Data Systems (INFOODS) Tagnames.† A unique abbreviation for a nutrient/food component developed by INFOODS to aid in the interchange of data
NutrDesc	A 60	N	Name of nutrient/food component
Num_Dec	A 1	N	Number of decimal places to which a nutrient value is rounded
SR_Order	N 6	N	Used to sort nutrient records in the same order as various reports produced from SR

* Primary key for the Nutrient Definition file.

† INFOODS, 2006.

Source Code File (file name = SRC_CD). This 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 and to provide values for the FNDDS, NDL staff imputed nutrient values for a number of proximate components, total dietary fiber, total sugar, and vitamin and mineral values.

- 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

* Primary key for the Source Code file.

Data Derivation Code Description File (file name = DERIV_CD). This file (Table 9) provides information on how the nutrient values were determined. The file contains the derivation codes and their descriptions.

- 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

* Primary key for the Data Derivation Code file.

For example, the data derivation code that indicates how α -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 Ref_NDB_No is 05621 Emu, ground, raw. This means that the analytical α -tocopherol value in the total solids of emu, ground, raw is used to calculate the α -tocopherol in the total solids of emu, fan fillet, raw.

$$N_t = (N_s * S_s) / S_t$$

where

N_t = the nutrient content of the target item,

N_s = the nutrient content of the source item,

For NDB No. 05621, α -tocopherol = 0.24 mg/100 g

S_s = the total solids content of the source item, and

For NDB No. 05621, solids = 25.38 g/100 g

S_t = the total solids content of the target item.

For NDB No. 05623, solids = 27.13 g/100 g

So, using this formula for the above example:

$$N_t = (0.24 \times 25.38) / 27.13 = 0.22 \text{ mg/100 g } \alpha\text{-tocopherol in Emu, fan fillet, raw}$$

Only items that were imputed starting with SR14 (2001) will have both derivation codes and reference NDB numbers. Other items that have been imputed outside the NDBS will have data derivation codes, but the Ref_NDB_No field will be blank.

Weight File (file name = WEIGHT). This file (Table 10) contains the weight in grams of a number of common measures for each food item.

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

Table 10.— Weight File Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Databank number
Seq	A 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, and 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

* Primary key for the Weight file.

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 Databank number
Footnt_No	A 4	N	Sequence number. If a given footnote applies to more than one nutrient number, the same footnote number is used. As a result, this file cannot be indexed
Footnt_Typ	A 1	N	Type of footnote: D = footnote adding information to the food description; M = footnote adding information to measure description; N = 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	Unique 3-digit identifier code for a nutrient to which footnote applies
Footnt_Txt	A 200	N	Footnote text

Sources of Data Link File (file name = DATSRCLN). This file (Table 12) is used to link the Nutrient Data file with the Sources of Data table. It is needed to resolve the many-to-many relationship between the two tables.

- Links to the Nutrient Data file by NDB No. and Nutr_No.
- Links to the Sources of Data file by DataSrc_ID.

Table 12.—Sources of Data Link File Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	5-digit Nutrient Databank number
Nutr_No	A 3*	N	Unique 3-digit identifier code for a nutrient
DataSrc_ID	A 6*	N	Unique ID identifying the reference/source

* Primary key for the Sources of Data Link file.

Sources of Data File (file name = DATA_SRC). This file (Table 13) provides a citation to the DataSrc_ID in the Sources of Data Link file.

- Links to Nutrient Data file by NDB No. through the Sources of Data Link file

Table 13.—Sources of Data File Format

Field name	Type	Blank	Description
DataSrc_ID	A 6*	N	Unique number identifying the reference/source
Authors	A 255	Y	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, such as a report from a company or trade association
Year	A 4	Y	Year article or document was published
Journal	A 135	Y	Name of the journal in which the article was published
Vol_City	A 16	Y	Volume number for journal articles, books, or reports; 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 of article/document
End_Page	A 5	Y	Ending page number of article/document

* Primary key for the Sources of Data file.

Abbreviated File

The Abbreviated file (file name = ABBREV) is available in ASCII format and as a Microsoft Excel spreadsheet. It contains all the food items found in the relational database, but with fewer nutrients and other related information. The abbreviated file does not include values for starch, fluoride, betaine, added vitamin E, added vitamin B₁₂, alcohol, caffeine, theobromine, vitamin D, phytosterols, individual amino acids, fatty acids, or sugars. Table 14 lists all the nutrients included in the abbreviated file. With SR20 (2007), total choline has been added to the Abbreviated file. The ASCII file (Table 14) is in delimited format. Fields are separated by a caret (^) and text fields are surrounded by tildes (~). 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 Weight file for each NDB number. To obtain values per one of the common measures, multiply the value in the desired nutrient field by the value in the desired common measure field and divided by 100. For example, to calculate the amount of fat in 1 tablespoon of butter (NDB No. 01001),

$$V_H=(N*CM_2)/100$$

where:

V_H = the nutrient content per the desired common measure

N = the nutrient content per 100 g

For NDB No. 01001, fat = 81.11 g/100 g

CM = grams of the common measure

For NDB No. 01001, 1 tablespoon = 9.4 g

So using this formula for the above example:

$$V_H = (81.11 * 9.4) / 100 = 7.52 \text{ g fat in 1 tablespoon of butter}$$

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. The data file has been imported into a Microsoft Excel 2000 spreadsheet for users of that application. Users of other software applications can import either the Microsoft Excel 2000 spreadsheet or the ASCII files. If additional information is needed, this file can be linked to the other SR files by the NDB number.

Table 14.—Abbreviated File Format

Field name	Type	Description
NDB_No.	A 5*	5-digit Nutrient Databank number
Shrt_Desc	A 60	60-character abbreviated description of food item†
Water	N 10.2	Water (g/100 g)
Energ_Kcal	N 10	Food energy (kcal/100 g)

Field name	Type	Description
Protein	N 10.2	Protein (g/100 g)
Lipid_Tot	N 10.2	Total lipid (fat)(g/100 g)
Ash	N 10.2	Ash (g/100 g)
Carbohydrtd	N 10.2	Carbohydrate, by difference (g/100 g)
Fiber_TD	N 10.1	Total dietary fiber (g/100 g)
Sugar_Tot	N 10.2	Total sugars (g/100 g)
Calcium	N 10	Calcium (mg/100 g)
Iron	N 10.2	Iron (mg/100 g)
Magnesium	N 10	Magnesium (mg/100 g)
Phosphorus	N 10	Phosphorus (mg/100 g)
Potassium	N 10	Potassium (mg/100 g)
Sodium	N 10	Sodium (mg/100 g)
Zinc	N 10.2	Zinc (mg/100 g)
Copper	N 10.3	Copper (mg/100 g)
Manganese	N 10.3	Manganese (mg/100 g)
Selenium	N 10.1	Selenium (μg /100 g)
Vit_C	N 10.1	Vitamin C (mg/100 g)
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_B6	N 10.3	Vitamin B ₆ (mg/100 g)
Folate_Tot	N 10	Folate, total (μg /100 g)
Folic_acid	N 10	Folic acid (μg /100 g)
Food_Folate	N 10	Food folate (μg /100 g)
Folate_DFE	N 10	Folate (μg dietary folate equivalents/100 g)
Choline, total	N 10	Choline, total (mg/100 g)
Vit_B12	N 10.2	Vitamin B ₁₂ (μg /100 g)
Vit_A_IU	N 10	Vitamin A (IU/100 g)
Vit_A_RAE	N 10	Vitamin A (μg retinol activity equivalents/100g)
Retinol	N 10	Retinol (μg /100 g)
Alpha_Carot	N 10	Alpha-carotene (μg /100 g)

Field name	Type	Description
Beta_Carot	N 10	Beta-carotene (µg/100 g)
Beta_Crypt	N 10	Beta-cryptoxanthin (µg/100 g)
Lycopene	N 10	Lycopene (µg/100 g)
Lut+Zea	N 10	Lutein+zeaxanthin (µg/100 g)
Vit_E	N 10.2	Vitamin E (alpha-tocopherol) (mg/100 g)
Vit_K	N 10.1	Vitamin K (phylloquinone) (µg/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 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 Weight file‡
GmWt_Desc2	A 120	Description of household weight number 2
Refuse_Pct	N 2	Percent refuse§

* Primary key 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 Weight file.

§ For a description of refuse, link to the Food Description file.

Update Files

The update files contain changes made between SR20 (2007) and SR21 (2008). Update files in ASCII are provided for those users who reformatted previous releases for their systems and wish to do their own updates. If a release earlier than SR20 is used, it is necessary to first obtain the update files for that release through SR20, update the database to SR20, and then use the update files for SR21. These updates are available on NDL's website:
<http://www.ars.usda.gov/nutrientdata>.

New data added to SR21 are given in the following files:

- ADD_FOOD for descriptions of the new items,
- ADD_NUTR for added nutrient data,
- ADD_WGT for added weight and measure data,
- ADD_FTNT for added footnotes,

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

Four files contain changes made since SR20 (2007):

- 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.
- CHG_NDEF contains records with changes to the nutrient definitions. The only changes to these items are to the SR order field.

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, Weight, and Nutrient Definition files.

Four files contain records that were deleted since SR20 (2007):

- DEL_FOOD file (Table 15) lists those food items that were deleted from the database.
- DEL_NUTR file (Table 16) lists those nutrient values that were removed from the database.
- DEL_WGT contains any gram weights that were removed. These records are in the same format as the Weight file (Table 10).
- DEL_FTNT contains any footnotes that were removed from the database (Table 17). Starting with SR19, if a given footnote applied to more than one nutrient number, the same footnote number can be used. When these footnote numbers are updated, the extra footnotes are deleted.

Table 15.—Foods Deleted Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	Unique 5-digit number identifying deleted item
Shrt_Desc	A 60	N	60-character abbreviated description of food item

* Primary key for Foods Deleted file.

Table 16.—Nutrients Deleted Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	Unique 5-digit number identifying the item that contains the deleted nutrient record
Nutr_No	A 3	N	Nutrient number of deleted record

* Primary key for Nutrients Deleted file.

Table 17.—Footnotes Deleted Format

Field name	Type	Blank	Description
NDB_No	A 5*	N	Unique 5-digit number identifying the item that contains the deleted nutrient record
Footnt_No	A 4	N	Sequence number
Footnt_Typ	A 1	N	Type of footnote of deleted record

* Primary key for Footnotes Deleted file.

Update files in ASCII are also provided for the Abbreviated file:

- CHG_ABBR file contains records for food items where a food description, household weight, refuse value, or nutrient value have been added, changed, or deleted since SR19. This file is in the same format as the Abbreviated file (Table 14).
- DEL_ABBR contains food items that have been removed from the database; it is in the same format as DEL_FOOD.
- ADD_ABBR contains food items added since SR19; it is also in the same format as the Abbreviated file.

Summary

This release contains a number of new food items as well as updated and expanded nutrients/food component values. A number of food items, no longer on the market, such as beef trimmed to ¼” fat, have been removed from the database. These are described in “Specific Changes for SR21” (p. 1). The next release, SR22, which will be released during Summer 2009, will contain additional items and updates.

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* Available on NDL's website: <http://www.ars.usda.gov/nutrientdata>

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
Noncarbonated	NONCARB
Nonfat dry milk	NFDM
Nonfat dry milk solids	NFDMS
Nonfat milk solids	NFMS
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	H2O

Whitener	WHTNR
Whole	WHL
Winter	WNTR
With	W/
Without	WO/
Yellow	YEL

¹ Removed in short description

Appendix B. Other Abbreviations

ap	as purchased
ARS	Agricultural Research Service
DFE	dietary folate equivalent
dia	diameter
DRI	Dietary Reference Intakes
fl oz	fluid ounce
FNDDS	USDA Food and Nutrient Database for Dietary Studies
g	gram
INFOODS	International Network of Food Data Systems
IU	international unit
kcal	kilocalorie
kJ	kilojoule
lb	Poundp
mg	milligram
µg, mcg	microgram
ml	milliliter
NDB	Nutrient Databank
NDBS	Nutrient Databank System
NDL	Nutrient Data Laboratory
NFNAP	National Food and Nutrient Analysis Program
NLEA	Nutrition Labeling and Education Act
oz	ounce
RAE	retinol activity equivalent
RE	Retinol Equivalents
RDA	Recommended Dietary Allowances
SR	USDA National Nutrient Database for Standard Reference