2019-2020 Food and Nutrient Database
for Dietary Studies
Documentation

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DISCLAIMERS

The USDA Food and Nutrient Database for Dietary Studies 2019-2020 was prepared by the following staff members of the Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, US Department of Agriculture:

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TABLE OF CONTENTS

INTRODUCTION

FNDDS – an application database for What We Eat in America, NHANES

The USDA's Food and Nutrient Database for Dietary Studies (FNDDS) is an application database created for analyzing dietary intakes from What We Eat in America (WWEIA), National Health and Nutrition Examination Survey (NHANES). It converts food and beverage portions reported in the survey into gram amounts and determines their nutrient values.

Appendix A lists abbreviations used in this documentation. The FNDDS 2019-2020 is the tenth version released.

Because the FNDDS generates the nutrient intake data files for WWEIA, NHANES, researchers do not need to use the FNDDS to estimate the nutrient intake for the survey respondents. FNDDS is made available for researchers to review the recipe calculations and nutrient profiles used to estimate intakes. Additionally, FNDDS can be applied in other dietary research studies to determine the amounts of nutrients/food components in food and beverages

What We Eat in America, NHANES

The NHANES is a nationally representative, cross-sectional survey designed to monitor the health and nutritional status of the civilian, noninstitutionalized U.S. population and is conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics. NHANES is a continuous survey with data releases every two years. Each 2-year cycle includes about 9,000 participants from sampled counties across the country.

The Food Surveys Research Group of the Beltsville Human Nutrition Research Center of USDA's Agricultural Service has lead responsibility for the survey's dietary data collection methodology and maintenance of the databases used to code and process data. Trained interviewers using the 5-step USDA Automated Multiple-Pass Method (AMPM) collect dietary intakes.

The AMPM includes an extensive compilation of standardized food-specific questions and possible response options. Routing of questions is based on previous responses. An initial 24-hour recall (Day 1) is collected in-person at a NHANES Mobile Examination Center; a second recall (Day 2) is collected by telephone 3-10 days later. The AMPM was validated in a large study and shown to be an effective method for accurately assessing group energy (Moshfegh et al, 2008) and sodium intake of adults (Rhodes et al, 2013).

New – features the interrelationship with AMPM

The FNDDS is a companion component to USDA's 24hour dietary recall instrument, the AMPM. Together, the FNDDS and AMPM form the two pillars of dietary surveillance in WWEIA, NHANES (Moshfegh et al, 2022) and are augmented by a data processing and review component.
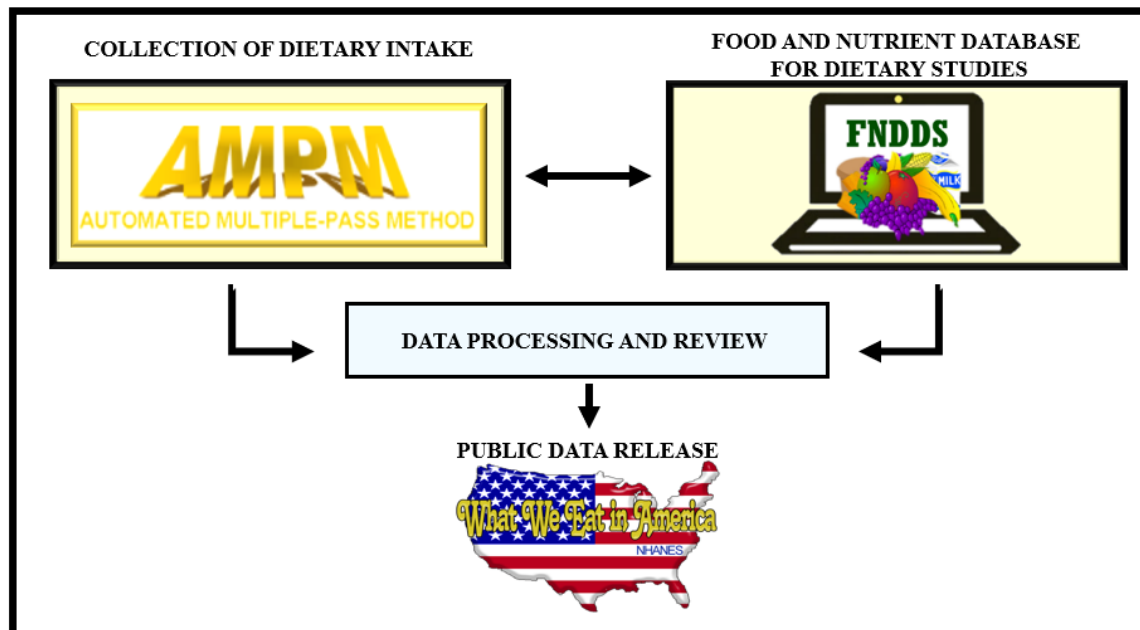
The AMPM and FNDDS are interrelated. AMPM questions and response options are the basis for the foods and portion options in the FNDDS. Since FNDDS codes are linked to pathways in the AMPM, updates to both are coordinated. An updated version of the AMPM is launched at the beginning of each 2-year survey cycle of NHANES. A new version of the FNDDS is released to support the updated AMPM.

See *Appendix B* for each version of FNDDS and its corresponding survey cycle of WWEIA, NHANES. Also, provided is the number of food codes added and discontinued for each FNDDS version as well as the total number of additional descriptions and nutrients/components.

NHANES 2017- March 2020 Prepandemic

New – a unique NHANES data release

The FNDDS 2019-2020 was developed to support the extensive changes to the AMPM used to collect dietary intakes beginning with NHANES data collection that started January 2019. The coronavirus disease 2019 pandemic required suspension of data collection in March 2020. As a result, the partially completed NHANES 2019-2020 cycle was not nationally representative and unbiased estimates could not be reliably produced. Therefore, the 2019-March 2020 data were combined with the data from the 2017-2018 cycle to create the nationally representative 2017-March 2020 prepandemic data files (Akinbami et al 2022)

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The 2017-March 2020 prepandemic files represent a unique public-use data release from NHANES. Dietary intakes were processed separately using FNDDS 2019-2020 for foods/beverages reported by respondents in 2019-March 2020 and then merged with data from NHANES 2017-2018.

FNDDS 2019-2020 is not to be used to detail or define foods in WWEIA, NHANES 2017-March 2020 Prepandemic. For more details see the *NHANES 2017-March 2020 Data Documentation, Codebook, and Frequencies - Dietary Interview* available at https://wwwn.cdc.gov/NCHS/nhanes/2017-2018/P_DR1IFF.htm

FNDDS 2019-2020 includes extensive updates from the previous release; these will be highlighted in the next sections.

Database Structure and Download

A brief overview of FNDDS 2019-2020 is provided in *Appendix C*; the nutrients and food components are listed in *Appendix D*.

FNDDS 2019-2020 is organized into 10 Access® tables or datasets linked by primary and secondary data items forming a relational database. As illustrated in *Appendix E. 2019-2020 FNDDS File Relationships*, the primary link is the food code; secondary links are portion code, nutrient code, ingredient code and derivation code. Two files were discontinued for FNDDS 2019-2020 – Subcode Descriptions and Food Code-Subcode Links.

The complete FNDDS 2019-2020 consists of the 10 data tables or datasets plus an additional table/dataset - *FNDDSRecCount* - that identifies the number of records in each table. Listed below are the full name and abbreviated name for each of the tables/datasets, separated into three components - Food Descriptions, Food Portions and Weights, and Nutrients.

Full Name	Abbreviated Name
Food Descriptions Component	
Main Food Descriptions	*MainFoodDesc*
Additional Food Descriptions	*AddFoodDesc*
Food Portions and Weights Component	
Food Weights	*FoodWeights*
Food Portion Descriptions	*FoodPortionDesc*
Nutrients Component	
FNDDS Nutrient Values	*FNDDSNutVal*
Nutrient Descriptions	*NutDesc*
Moisture Adjustment	*MoistAdjust*
FNDDS Ingredients	*FNDDSIngred*
Ingredient Nutrient Values	*IngredNutVal*
Derivation Descriptions	*DerivDesc*

Field name and description for every variable in FNDDS 2019-2020 are provided in
Appendix F. Contents of Datasets.

The complete FNDDS 2019-2020 is available for download at www.ars.usda.gov/nea/bhnrc/fsrg
in both Access® and SAS®.

FNDDS At A Glance

Selected variables provide quick viewing and searching in five Excel® files:

> Foods and Beverages
> Portions and Weights
> FNDDS Ingredients
> Ingredient Nutrient Values
> FNDDS Nutrient Values

Appendix G. FNDDS At A Glance provides a list of variables plus descriptions contained in
each of the five Excel® spreadsheets. Each file contains an additional tab listing variables and
descriptions. Although the Excel® files contain only selected variables, data, by variable, are the
same in all database formats.

The next sections describe some of the aspects of the three components: Food Descriptions,
Food Portions and Weights, and Nutrients.

FOOD DESCRIPTIONS COMPONENT

The FNDDS 2019-2020 contains 5,624 food and beverage items (4,982 foods/642 beverages). *Appendix B* provides a summary of the number of food codes added and discontinued for each version of FNDDS.

Food Code

An 8-digit number – food code – uniquely identifies each food or beverage item in FNDDS. Food code numbers are generally assigned according to a classification scheme that associates the first digit with one of nine major food commodity groups: Milk and Milk Products; Meat, Poultry, Fish, and Mixtures; Eggs; Dry Beans, Peas, Other Legumes, Nuts, and Seeds; Grain Products; Fruits; Vegetables; Fat, Oils, and Salad Dressings; Sugars, Sweets, Beverages. The first two digits of the 8-digit code, as illustrated in *Appendix H,* identify subgroups that are more specific.

If a food or beverage as described in FNDDS is determined to have changed dramatically or no longer available, the food code may be discontinued. Discontinued food codes are removed from the current FNDDS, and the 8-digit numbers are not recycled. It is important to note that although a code number was discontinued, the food or beverage associated with that food code may still be available; however, it is now associated with one or more different food codes. Beginning with the FNDDS 2011-2012, a resource file details every discontinued food, rationale for discontinuation, and if appropriate, a link to a new FNDDS code (Adler et al, 2016). *Discontinued Food Codes between FNDDS 2017-2018 and FNDDS 2019-2020* are available on the FSRG website www.ars.usda.gov/nea/bhnrc/fsrg.

Main Description

The main food description is the primary complete description identified by a unique 8-digit food code and may include form, preparation method, and source of item. Main food descriptions may be modified over time; however, if the food or beverage is determined to have changed dramatically or no longer available, the food code may be discontinued.

The main descriptions are usually generic in nature; however, some codes include a brand name, often in parentheses. This designates that a respondent reported the brand name product; however, the nutrient profile may match a generic food/beverage or a composite of several similar products because the full nutrient profile of the individual brand name product was not available. Main descriptions that contain a brand name include infant formulas, chips, crackers, energy drinks, nutrition bars and powders, and selected burgers from two fast food chains.

Additional Food Description

The FNDDS 2019-2020 contains 10,047 additional food descriptions located in *AddFoodDesc*. Additional food descriptions, associated with a specific main food description, share the same nutrient values and portion weights as the main food description. More than one additional description may be associated with a food code; not all food codes have additional descriptions.

Many additional food descriptions are brand names; others represent similar forms of the main food description. The additional food descriptions provide information that is particularly useful when coding dietary intakes from respondents in WWEIA, NHANES based on responses elicited from questions asked during the 24-hour recall.

 New for FNDDS 2019-2020 – updated food codes

Specific categories of foods/beverages completely updated in AMPM and FNDDS 2019-2020 include the following: beef, pork/ham, fish, shellfish, pies, cakes, turnovers, candy, ready-to-eat cereal, water, as well as all baby toddler items: food, juice, cereal, infant formula*.*

Beginning with 2015-2016, the shift began to collecting sandwiches as a single item versus collecting very detailed information about each component and amounts (bread, meat, cheese, condiments) – details not known by many respondents in WWEIA, NHANES. Changes to the AMPM used to collect dietary intakes for 2019-2020 resulted in new codes for breakfast sandwiches, BBQ sandwiches and deli/cured meat sandwiches. Currently, most sandwiches reported in WWEIA, NHANES are now collected and coded as single items in FNDDS. Condiments and vegetables that were on the sandwich are collected as additions and usually coded using gram weights reflecting a guideline amount on a regular sandwich or a large sandwich.

Tacos, burritos and burrito bowls, enchiladas, quesadillas, and other Mexican items were also updated in AMPM and FNDDS 2019-2020. Currently, most are now collected as a single item. Condiments and vegetables are collected as additions.

FNDDS codes for use with sandwiches and vegetables

Food codes to collect vegetables/bacon on sandwiches, and sauces/meats in vegetables were added to FNDDS beginning in 2017-2018. The 'for use with' codes all have 899 as the first 3-digits.

Nine codes capture the following ingredients for use on a sandwich or burger: avocado, cucumber, lettuce, mushrooms, onions, pepper, spinach, tomatoes, and bacon. These codes allow researchers to determine the contribution of sandwiches more readily to vegetable intake in WWEIA.

In addition, nine codes capture the following for use with cooked vegetables: bacon, ham, beef, chicken, cream sauce, cheese sauce, gravy, soy-based sauce, and tomato sauce. This reduces the necessity of creating multiple codes for each vegetable variety to capture products cooked with meat or cooked with a sauce.

NFS, NS

When a survey respondent In NHANES is unable to answer all questions about a food/beverage or if detailed questions are not asked, a food code is selected that contains the term NS (not specified) or NFS (not further specified) in its main or additional description. Nutrient values and portion weight data for the NFS or NS food codes are based on food consumption data from WWEIA, internal data on the frequency of reports, food production and supply statistics, and food industry publications.

Sources used to determine proportions and subsequent nutrient profiles for *11100000 Milk, NFS, 82101000 Vegetable oil, NFS*, as well as other top reported NFS codes were reviewed and revised as necessary to reflect data current during the corresponding 2-year survey cycle. For example, data on food availability and products from the USDA, Economic Research Service helped determine the proportions of different fat-content milks (USDA, ERS, Food Availability) and various types of vegetable oils (USDA, ERS, Oil Crops Yearbook).

What We Eat in America Food Category Number and Description

Beginning with FNDDS 2015-2016, the WWEIA Food Category number and description are included for each FNDDS food code. Both the WWEIA Food Category 4-digit number and description are included as variables in four of the At A Glance Excel® spreadsheets to support search capabilities.

The WWEIA Food Categories provide an application to analyze foods and beverages as consumed in the American diet (Rhodes et al, 2017). The focus of this classification system is grouping similar foods and beverages together based on how items are typically consumed and on their nutrient content. Each FNDDS food code is assigned to only one of the WWEIA Food Categories.

Appendix I. WWEIA Food Categories: Code and Description lists the 169 individual food categories combined into 15 main groups: Milk and Dairy; Protein Foods; Mixed Dishes; Grains; Snacks and Sweets; Fruit; Vegetables; Beverages; Alcoholic Beverages; Water; Fats and Oils; Condiments and Sauces; Sugars; Baby Foods and Formulas; and Other. Within the main groups are subgroups (Milk, Flavored Milk. Dairy Drinks and Substitutes, Cheese, and Yogurt) characterized by similar food-related properties. Designed to be flexible, the WWEIA Food Categories can easily be combined into a variety of larger groupings.

 New for FNDDS 2019-2020 – additional WWEIA Food Categories

Changes made to the WWEIA Food Categories reflect updates to sandwiches and baby/toddler foods in AMPM and FNDDS 2019-2020. New WWEIA Food Categories were added for deli and cured meat sandwiches, meat and BBQ sandwiches, vegetable sandwiches/burgers, and baby food: mixtures. Other changes include the renaming of chicken fillet sandwiches; any deli or luncheon meat sandwich code was reassigned to the new deli and cured meat sandwich category. Two categories were deleted: other sandwiches; and formula, prepared from concentrate.

WWEIA Food Categories for use with WWEIA, NHANES 2017- March 2020 Prepandemic

New - release of WWEIA Food Categories for use with 2017-March 2020 files

Since 2007-2008, a new version of the WWEIA Food Categories was produced for each 2-year cycle of WWEIA, NHANES and released on the FSRG website.

The 2017-March 2020 files represent a unique public-use data release from NHANES; therefore, the WWEIA Food Categories for use with WWEIA, NHANES 2017-March 2020 Prepandemic were developed. This includes all numeric food codes and long descriptions as provided in the 2019-March 2020 data release.   FNDDS 2017-2018 and FNDDS 2019-2020 were used to assign the WWEIA Food Category 4-digit number and description. FNDDS 2019-2020 includes extensive updates and was the basis for most assignments. More detailed information about the WWEIA Food Categories for use with WWEIA, NHANES 2017-March 2020 Prepandemic is located at www.ars.usda.gov/nea/bhnrc/fsrg. Included are:

- *WWEIA Food Categories for use with WWEIA, NHANES 2017-March 2020 Prepandemic* – table summarizing changes from 2015-2016.

- *WWEIA Food Categories for use with WWEIA, NHANES 2017-March 2020 Prepandemic* – for each food category, provides 4-digit category number and name, number of times reported in 2017-March 2020, and number of FNDDS codes in category

- *FNDDS codes linked to WWEIA Food Categories for use with WWEIA, NHANES 2017-March 2020 Prepandemic* – for each FNDDS code, provides the number of times reported on day 1 and day 2 of the 2017- March 2020 release. This resource provides a quick access to examine unweighted frequency counts for each FNDDS food code and by food category.

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FOOD PORTIONS AND WEIGHTS COMPONENT

During the 24-hour recall, respondents in WWEIA, NHANES estimate the amount of food and beverages consumed using 3-dimensional models on Day 1 and a Food Model Booklet on Day 2. Respondents can also report food specific amounts such as a medium apple, 2 slices of bread, can of soda. Either way, the amounts of foods and beverages reported need to be converted into a gram weight amount. FNDDS 2019-2020 contains approximately 23,000 weights for portions of foods and beverages. The wide variety of portion weights in the FNDDS makes it easier to code the extensive assortment of amounts that are reported in WWEIA, NHANES and other dietary studies.

Portion Code and Portion Description

For each food code in FNDDS, there is a set of portion codes (*FoodWeights*) and portion descriptions (*FoodPortionDesc*). A portion code is a unique 5-digit number that identifies a portion description or unit of measure, e.g., slice, piece, snack size, medium, teaspoon, cup. The same portion description and code are used for many different foods/beverages. Each food and beverage item in FNDDS contains multiple portion codes and portion descriptions.

Portion Weight

The weight of a food/beverage item for the portion indicated by a portion code is available in *FoodWeights*. All weights are in grams of edible portion as consumed. Weights are estimations to represent a group of foods and beverages and may not account for all sizes available for a specific product. A single FNDDS food code often includes several products; therefore, portion gram weights reflect a generic food/beverage or a composite of several similar products. Among comparable types of foods and beverages, portion weights were streamlined for consistency. Portion weights in FNDDS, developed for estimating food and nutrient intakes of respondents in WWEIA, NHANES, may not be applicable for calculating density or weight per volume for any specific liquid.

> *Discontinued - subcodes*

Subcodes and their unique portion weights are discontinued for FNDDS 2019-2020. The two categories of foods containing subcodes – candy and snack cakes – were revised for this release; codes reflect generic products and weights.

Unknown Amounts

The FNDDS contains a portion code 90000 - Quantity Not Specified (QNS) for every food/beverage item in FNDDS. When a respondent is unable to estimate the amount they consumed, this portion code is selected.

QNS values may reflect the most frequently consumed or most likely portion measure or they may reflect consumption patterns estimated from WWEIA data for a category of foods or beverages. Therefore, for any individual food code, the QNS measure may not represent the amount reported by most respondents. Database users should not assume that QNS values accurately represent the average amount of a food or beverage consumed.

NUTRIENTS COMPONENT

The six tables in the Nutrients Component of FNDDS 2019-2020 provide the nutrient profile for each food code. In addition, they specify details on the development of each nutrient profile as well as the source for each individual nutrient value used to generate FNDDS food codes. Every FNDDS food code contains a complete nutrient data set for energy and 64 nutrient/food components. The nutrient values reflect an average value for a generic representation of foods, likely consumed by the U.S. population. The food codes and nutrient profiles are not intended to represent specific products and may not indicate level of preparation or degree of processing. The FNDDS is an application database created for analyzing dietary intakes from WWEIA, NHANES.

Source of Nutrient Values

For FNDDS 2019-2020, the source for most nutrient values is the USDA FoodData Central (FDC) integrated data system (USDA, ARS, 2019) available at www.fdc.nal.usda.gov. Containing all USDA's major sources of food and nutrient data, FDC (Fukagawa et al, 2022) includes five distinct data types that provide information on food and nutrient profiles.

FDC contains three well-established data types: Standard Reference (SR) Legacy, USDA Global Branded Foods Database (Branded Foods), and FNDDS. FDC also includes two new data types: Foundation Foods and Experimental Foods.

Because of the uniqueness of each data type, not all provide data on every nutrient. FNDDS utilizes data primarily from Foundation Foods and SR Legacy for the basis of its nutrient values.

SR Legacy provides nutrient values derived from analyses, calculations, and published literature. Released in April 2018, it is the final release of this data type and will not be updated. Older versions of SR available at www.ars.usda.gov/nea/bhnrc/mafcl.

Foundation Foods includes values for nutrients and other food components derived primarily from analysis as well as extensive underlying metadata.

The six tables or datasets explained in the Nutrients Component section include:

FNDDSNutVal
NutDesc
FNDDSIngred
MoistAdjust
IngredNutVal
DerivDesc

FNDDS Nutrient Values and Nutrient Descriptions

Nutrient values per 100 grams of edible portion for energy and 64 nutrients/food components for each FNDDS food/beverage item by nutrient code are in *FNDDSNutVal*.

The nutrient code is the same unique 3-digit identifier code for a nutrient historically used in SR. The nutrient description for each 3-digit nutrient code is in *NutDesc*.

Since the numerical codes designating a nutrient differ between FNDDS and FDC, *Appendix K* provides a crosswalk. For each nutrient/food component in FNDDS, both the 3-digit Nutrient Code in FNDDS and SR as well as the 4-digit FDC Nutrient ID are listed.

This table, *NutDesc*, also contains the measurement unit (g, mg, or µg) and the number of decimal places to which a nutrient value is rounded for energy and each of the 64 nutrient/food components. The number of decimal places follows conventions in SR Legacy and does not reflect the accuracy of the value. Also included in *NutDesc* is Tagname, the INFOODS unique abbreviation for a food component (Food and Agriculture Organization).

FNDDS Ingredients

Information provided in *MoistAdjust* and *FNDDSIngred* generate the nutrient profiles for foods and beverages in FNDDS 2019-2020 as provided in *FNDDSNutVal*.

Data for about 1,900 items in FDC were used to determine the values for the 5624 food and beverage items in FNDDS 2019-2020. Approximately one-third of the FNDDS food codes are a direct match to a single FDC code and therefore have only one **ingredient code**.

The FNDDS ingredient codes can be identified by number of digits.
- FDC/SR code (4, 5 or 6-digit NDB No)
- FSRG generated code (6-digit, begin with '9')
- FNDDS code (8-digit)
- FNDDS code for use only in recipes (8-digit, begin with '9999')

The **ingredient description** may be an FDC/SR description, FNDDS main description, or a generated description based on another FDC code. *FNDDSIngred* also provides the amount, measure, and portion code used to calculate ingredient weights(s).

Recipe Calculations

The nutrient profiles for the other two-thirds of the FNDDS food codes in FNDDS 2019-2020 were generated using a recipe calculation process utilizing two or more *ingredients*. The **ingredient codes** can be FDC/SR codes, FNDDS codes, FSRG generated codes, or a combination of these codes.

Recipe calculation can be briefly summarized into 3 steps:
- select the ingredients and their amounts
- apply factors, if appropriate – nutrient retention and moisture adjustment
- sum nutrient values for all ingredients to generate a nutrient profile

The 'recipes' are not cookbook-style recipes, but rather calculated nutrient values based on ingredient proportions. A recipe calculation does not usually reflect a specific recipe for an item; but rather selects ingredients and amounts to estimate a nutrient profile that may represent several variants of a particular food or beverage. A variety of sources was utilized to determine ingredients and their amounts: food label data from USDA Global Branded Food Products Database and company websites, product preparation instructions, label ingredients, and cookbooks and recipe websites.

In general, a recipe calculation approach generated nutrient profiles for home-prepared dishes, as well as cooked meats, eggs, grains, and vegetables that consider salt and/or fat used in preparation. When no appropriate composition data from FDC for processed or restaurant foods were available, recipe calculations generated nutrient profiles for those foods as well.

Recipe calculations were the most common technique used to generate nutrient data for the approximately 1000 FNDDS food codes new/updated for the following categories in 2019-2020: sandwiches, tacos and burritos, beef, pork/ham, fish, shellfish, pies, cakes, turnovers, candy, ready-to-eat cereal, water as well as all baby toddler items: food, juice, cereal, infant formula. General protocols were developed to standardize and streamline the ingredients for comparable codes within a type or category of related foods/beverages.

Each ingredient code, plus the amount, used to create a nutrient profile for a food or beverage in FNDDS is in the table/dataset *FNDDSIngred*. The ingredient codes used to generate nutrient profiles for each FNDDS food code are easily viewed in the Excel® spreadsheet **At A Glance: FNDDS Ingredients**.

It is important to remember:

- *Recipe calculations are developed to represent multiple variants of a basic dish.*

- *Since ingredients are selected to yield a nutrient profile for a food/beverage code, the ingredient codes selected do not necessarily represent the exact ingredients in a product. Ingredients used in recipe calculation are not 'label ingredients' found on products.*

- *Recipe ingredients do not generally include items that contribute minimally to the nutrient content of the food or beverage.*

- *FNDDS food codes consider salt and fat used in preparation and may be included as an ingredient. However, each ingredient for salt or fat does not imply they are actually 'ingredients' in a product. They may be added to a recipe calculation to represent a nutrient profile.*

Retention Codes and Moisture Adjustment

In addition to selecting the appropriate ingredients and proportions for each recipe calculation, retention factors and moisture adjustments are applied to calculate FNDDS nutrient values (Powers and Hoover, 1989).

Retention codes
Nutrient losses that occur because of cooking are accounted for in many recipe calculations using the *USDA Table of Nutrient Factors, Release 6* (USDA, ARS, NDL 2007). The table has retention factors for 16 vitamins, 8 minerals, and alcohol for types of foods; each retention factor is the percent of the specific nutrient that remains in the food after preparation. Retention factors are provided for different food groups with a range of cooking and preparation methods. Each food group/cooking method (retention description) has a unique 4-digit retention code.

When a retention factor is utilized for an ingredient code, the 4-digit retention code is listed in *FNDDSIngred.* During the recipe calculation the retention factor (percentages of nutrient retained) was applied at the ingredient-level to create the final nutrient profile.

Moisture adjustment
The moisture change accounts for how much water a food will lose or gain during cooking. The loss or gain of water during cooking can have a substantial effect on the nutrient content when expressed on a per 100-gram basis. Provided in *MoistAdjust*, moisture change is expressed as a percentage of the total weight of the food/beverage item. Moisture loss is applied at the recipe-level; therefore, the weight for each ingredient is the weight before adjustments for moisture loss.

Selection of a moisture loss to represent a cooked product is informed using *USDA's Food Yields Summarized by Different Stages of Preparation* (USDA, ARS, 1975) as well as other limited sources. For some recipes, moisture adjustments were performed until the moisture value in the recipe food was close to the moisture value of a similar analyzed food where available.

Any increase or decrease in fat during cooking is incorporated into the ingredients; therefore, recipe calculations do not include any fat change - gain or fat loss during cooking. This process began with FNDDS 2015-2016.

Links to both the *USDA Table of Nutrient Retention Factors* and *Food Yields Summarized by Different Stages of Preparation* are available for quick reference as resources on the FSRG website along with FNDDS databases and documentation.

In addition to FDC codes and FNDDS codes, two types of ingredient codes were developed by FSRG to assist in generating nutrient profiles. FNDDS 2019-2020 includes 9 ingredient codes for lower sodium products and 7 ingredient codes for single nutrients and a vitamin composite.

Ingredient Codes – Lower Sodium Products

Eight codes generated to reflect reduced sodium products were developed for FNDDS 2015-2016. These codes are 6-digits with '9' as the initial digit. Except for sodium, the nutrient profiles are identical to the FDC code (identified by digits 2-6) and FDC description (following REDUCED SODIUM). The amount of sodium in each FDC code was decreased by 25% for each REDUCED SODIUM product to reflect the nutrient content claim for products labeled as reduced sodium.

An additional code was added for FNDDS 2019-2020 to reflect tomato juice, no salt added. The nutrient profile is identical to the FDC code (identified by digits 2-6), except the amount of sodium reflects only the inherent sodium in tomato juice.

907971	REDUCED SODIUM: Bologna, meat and poultry
907057	REDUCED SODIUM: Pepperoni, beef and pork, sliced
907072	REDUCED SODIUM: Salami, dry or hard, pork, beef
907028	REDUCED SODIUM: Ham, sliced, pre-packaged, deli meat (96%fat free, water added)
907961	REDUCED SODIUM: Chicken breast, deli, rotisserie seasoned, sliced, prepackaged
907081	REDUCED SODIUM: Turkey breast, sliced, prepackaged
907043	REDUCED SODIUM: Roast beef, deli style, prepackaged, sliced
912695	REDUCED SODIUM: Nuts, almond butter, plain
911540	LOW SODIUM: Tomato juice

Ingredient Codes – Single/Composite Nutrients

➡ *New for FNDDS 2019-2020* – additional single/composite nutrient codes

FNDDS 2019-2020 contains 7 ingredient codes that are specific for a single nutrient or composite of nutrients. They are used to meet nutrient profiles for assumed fortification of ready-to-eat cereals. Vitamin D (added to FNDDS 2017-2017) is also used for regular yogurt and baby food yogurt; recipe calculations assume 1.2-µg vit D/100g

999001	Vitamin B composite in cereals
999291	Fiber, total dietary, as ingredient
999301	Calcium as ingredient
999303	Iron as ingredient
999328	Vitamin D as ingredient
999401	Vitamin C as ingredient
999431	Folic acid as ingredient

FNDDS Codes Used Only in Recipes

New for FNDDS 2019-2020 – 3 additional 'as ingredient' codes

The recipe approach was also used to create nutrient profiles for a group of food codes that were only used in subsequent recipe calculations. FNDDS 2019-2020 contains 28 codes; all have 9999 as the first four digits. These food codes are not used to code dietary intakes in WWEIA. The 9999 codes are only used as an ingredient in recipe calculations to standardize and streamline the development of nutrient profiles. The 3 ingredient codes added to FNDDS 2019-2020 include:

99991410	Cheese and Queso as ingredient
99992100	Beef as ingredient in recipes
99992405	Chicken as ingredient in recipes

The individual ingredients for these codes were selected, based on availability of FDC codes, to reflect a composite to use in tacos, burritos, and Mexican items.

Selected codes previously added in FNDDS include:

99991400	Cheese as ingredient in sandwiches
99992230	Breakfast meat as ingredient in omelet
99995000	Breading or batter as ingredient in food
99995130	Wheat bread as ingredient in sandwiches
99995135	Wheat bun as ingredient in sandwiches
99997220	Broccoli, cooked, as ingredient
99997310	Carrots, cooked, as ingredient
99997800	Dark green vegetables as ingredient in omelet
99997802	Tomatoes as ingredient in omelet
99997804	Other vegetables as ingredient in omelet
99997810	Vegetables as ingredient in curry

The individual ingredients of some of the 9999 codes were selected based on frequency of reports in WWEIA. For example, *Wheat bread as an ingredient in sandwiches* is based on frequency of reports of bread other than white bread for use in sandwiches.

FNDDS provides transparent and easy access to the individual ingredients for the 'as ingredient' codes, as well as all recipes in FNDDS. **At A Glance – FNDDS Ingredients** provides quick viewing and searching. This Microsoft Excel file lists ingredient codes and amounts that generate nutrient profiles – or recipes – for each FNDDS code.

Ingredient Nutrient Values

The development of FNDDS 2019-2020 began with the continued evaluation of the integrity and currency of underlying values for the ingredient codes from FDC that form the basis of nutrient profiles for each FNDDS food/beverage. This evaluation resulted in the removal of SR Legacy codes used in earlier versions of FNDDS and the addition of new Foundation Foods. Some nutrient values for FDC codes were modified or corrected for inclusion in FNDDS and therefore differ from the value in FDC.

To enhance the transparency of developing nutrient profiles in FNDDS, expanded characterization of both the source used for the nutrient values, and the year of their determination were added to *IngredNutVal* beginning with the FNDDS 2015-2016.

The dataset *IngredNutVal* contains only the ingredient codes from FDC/SR and does not contain FNDDS codes used as ingredients. Included in *IngredNutVal* are the NDB number (Ingredient code) and corresponding description (Ingredient description). Also provided, for each ingredient code are the following:

- Nutrient value for energy and 64 nutrients– amount per 100g edible portion
- Nutrient value source
- Derivation code
- SR AddMod Year or Foundation year acquired

The variable – **nutrient value source** – provides the FDC database or additional source that is the basis for each individual nutrient value. See *Appendix L*. for the 13 sources that are the basis for each nutrient value in FNDDS 2019-2020.

Most nutrient values for ingredient codes in FNDDS 2019-2020 utilized the value obtained directly from FDC as downloaded on October 2021 which included data types - SR Legacy and Foundation Foods. These nutrient values will also have a new FNDDS variable - FDC ID. In FDC, a unique code or FDC_ID number identifies samples for each food contained in each of the data types. Currently, an FDC_ID number is assigned randomly when new or updated versions of foods are published in FDC.

Nutrient values for some ingredient codes used in FNDDS were modified and therefore differ from the value in FDC. At least one nutrient value was modified for about 43 of the FDC codes downloaded from FDC. The source for the modified nutrient value is provided.

For a few ingredient codes, a source other than SR Legacy or Foundation was the basis for either all, or for only select nutrients. The specific source for each nutrient is listed.

 New – increased number of Foundation Foods

Since the launch of FDC in 2019, FNDDS has utilized Foundation Foods that reflect more current analytical data. Foundation Foods is the source for 113 ingredient codes in FNDDS 2019-2020, compared to 46 codes in the previous FNDDS. Most nutrient values in Foundation Foods are based primarily on analyses conducted by USDA.

The number of SR codes used as ingredients has decreased with subsequent release of FNDDS. For FNDDS 2019-2020, there were 1,753 SR codes used as ingredients. In 2017-2018, there were 2,277 SR codes used as ingredients. SR Legacy was released in April 2018 and is the final release of this data type and will not be updated.

Foundation Foods target important nutrients in that food; therefore, they do not contain all the nutrients provided in FNDDS. For the 113 Foundation Food codes utilized in FNDDS 2019-2020, 45% of the nutrient values are truly Foundation Food values for the ingredient code's FF NDB number. To provide a complete profile for energy and the 64 nutrients in FNDDS, about half the missing values were borrowed from a SR Legacy code with the same NDB number. The other half of missing values were calculated, assumed zero, or assumed from another Foundation Food/SR Legacy code.

Examples of assumptions and calculations include:

- Value for energy utilized the Foundation Foods value for Atwater General Factors (FDC Nutrient ID 2047) of 4, 9, and 4 for protein, fat and carbohydrate, respectively. When not provided, energy was calculated using the same Atwater General Factors.

- Values for fiber utilized the Foundation Foods FDC value for fiber, total dietary (FDC Nutrient ID 1079) to be consistent with FNDDS.

- Foundation Foods provided values for Sugars, Total NLEA (nutrient code 269.3/ID 1063); this value was used for the FNDDS nutrient Sugars, total (nutrient code 269).

- Values for added B12 and added vitamin E were assumed from the values for total vitamin B12 and vitamin E provided in Foundation Foods and the added fortification amount found in similar Foundation or SR Legacy codes.

- Values for food folate, folic acid and folate (DFE) were assumed from the value for total folate - the only folate component provided in Foundation Foods. Values for food folate from similar Foundation or SR Legacy codes were used to impute the value of folic acid and calculation of folate, DFE, of enriched flours.

- For vitamin A components, certain values were assumed to be zero, reflecting zero or minimal (<100 µg) SR Legacy values.

- When fatty acid data were available, calculated sums of cis- and trans-fatty acids from Foundation Foods were used to be consistent with FNDDS. Individual fatty acid values not listed for a Foundation Food were assumed to be zero.

- Where nutrient values were not available for a Foundation Food from a similar Foundation Food or the same NDB number for a SR Legacy code, the closest matching food was used to complete the profile.

Nutrient values in Foundation Foods are rounded to scientifically appropriate significant figures and may differ from the number of digits that FNDDS reports for a nutrient. After making necessary calculations, the nutrient values were rounded to be in line with FDC rounding methods for Foundation Foods.

The FNDDS dataset *IngredNutVal* contains additional variables to provide details important in assessing the currency for each nutrient value downloaded from FDC. The variables differ based on which FDC data type is used. If the source is SR Legacy, **SR AddMod year** is provided which indicates the year a nutrient value was added or last modified as defined by SR. Although SR provides a month and year, only the year is listed in FNDDS. If SR ADDMod year is blank for an ingredient with nutrient value source as SR Legacy, the data were missing.

If the source is Foundation, **Foundation year acquired** is listed which is defined in FDC as the minimum purchase year. If blank, the date was not provided.

Derivation Description

If the nutrient value source is SR Legacy or Foundation, a derivation code provides information about how a value was calculated or imputed as defined in FDC. *Appendix J* is a list of FDC derivation codes and descriptions that provide specific information on how the value was determined. This information is available in a new table/dataset added in FNDDS 2015-2016, and expanded for subsequent versions of FNDDS.

Some SR derivation codes reference 'source codes' in the description. *Appendix J* includes a listing of the referenced source code and accompanying description. The source codes (indicating the type of data) and descriptions are as defined by FDC.

Major Changes in FNDDS 2019-2020 Compared to FNDDS 2017-2018

 New – highlight extensive changes for FNDDS 2019-2020

For FNDDS 2019-2020, the continued focus was on generic codes that reflect likely products as consumed by the U.S. population and on generating nutrient profiles that reflect a variety of items rather than linking to a single SR code. The focus was also on standardizing and streamlining development of recipes/nutrient profiles. There were 1,820 codes discontinued for FNDDS 2019-2020 and 361 new codes added.

In addition to the new codes added, recipes were revised for approximately another 600 food and beverage items. At the same time, more Foundation Foods were utilized in FNDDS 2019-2020. These adjustments resulted in extensive changes in the nutrient profiles. Of the 5,263 food codes that had the same code number in 2017-2018, more than 50% had changes in the nutrient profile and 20% had changes in at least half of their nutrients.

The collection of both baby/toddler foods and ready-to-eat cereals were updated for the AMPM used to collect dietary intakes beginning with NHANES data collection that started January 2019. The FNDDS codes were also updated as highlighted below.

<u>Baby Toddler Foods</u>

Changes to Baby Toddler foods for FNDDS 2019-2020 highlight the focus toward generic codes with nutrient profiles that represent a variety of items. As in earlier versions of FNDDS, appropriate SR Legacy codes are used for single fruits, vegetables, meats, juices, dry cereals, and baby snack items. Generic codes – such as *baby toddler fruit and vegetables* – were developed to represent multiple variants of baby food pouches, jars, and trays. The proportions of fruit and vegetables in this code are based on frequency reports from WWEIA, commercial websites and published research (Moding et al, 2018).

FNDDS 2019-2020 contains 84 items (utilizing 56 FDC codes) that represent all baby /toddler foods – cereals, juices, snacks, single fruits and vegetables and mixtures. This is a change from 2017-2018 when there were 229 FNDDS codes linked to 191 very specific SR Legacy codes.

<u>Ready-to-eat cereals</u>

The changes to ready-to-eat cereals represent the most dramatic change incorporated into the FNDDS. For FNDDS 2019-2020, recipes – or nutrient profiles – were developed for each ready-to-eat cereal code. In previous releases, cereals were matched directly to a specific SR code. Most of these were from SR28 and are not included in SR Legacy.

For FNDDS 2019-2020, codes for ready-to-eat cereals used FDC codes for basic ingredients – 5 types of flour, sugar, oil, salt, and soy protein isolate. Extra items were used for products that contained raisins, nuts, chocolate, peanut butter, or marshmallows. The 7 ingredient codes for single/composite nutrients were incorporated to reflect the nutrient profiles of popular cereals and published research (Smith et al, 2020). The result is 43 FNDDS codes for 'generic' ready-to-eat cereals.

The food code descriptions and nutrient profiles of ready-to-eat cereals in FNDDS 2019-2020 do not necessarily represent one specific brand of cereal; they may include several brands, store brands, or a combination of different varieties.   In comparison, FNDDS 2017-2018 contained 134 very specific FNDDS codes linked to 122 SR28 codes.

LITERATURE CITED

Adler ME, Rhodes DG, Moshfegh AJ. (2017). Discontinued codes in the USDA Food and Nutrition Database for Dietary Studies. *Journal of Food Composition and Analysis* 64:104-106.

Akinbami LJ, Chen TC, Davy O, Ogden CL, Fink S, Clark J, et al. National Health and Nutrition Examination Survey, 2017–March 2020 prepandemic file: Sample design, estimation, and analytic guidelines. National Center for Health Statistics. Vital Health Stat 2(190). 2022. DOI: https://dx.doi.org/10.15620/cdc:115434

Food and Agriculture Organization. International Network of Food Data Systems (INFOODS), *Tagnames for Food Components.* Available from: http://www.fao.org/infoods/infoods/standards-guidelines/food-component-identifiers-tagnames/en/. Accessed 2020 June 1.

Fukagawa NK, McKillop K, Pehrsson PR, Moshfegh A, Harnly J, Finley J. (2022). USDA's FoodData Central: what is it and why is it needed today? *American Journal of Clinical Nutrition* 115:619-624.

Moding KJ, Ferrante MJ, Bellows LL, Bakke AJ, Hayes JE, Johnson SL. (2018). Variety and content of commercial infant and toddler vegetable products manufactured and sold in the United states. *American Journal of Clinical Nutrition* 107:576-583.

Moshfegh AJ, Rhodes DG, Baer DJ, Murayi T, Clemens JC, Rumpler WV, Paul DR, Sebastian RS, Kuczynski KJ, Ingwersen LA, Staples RC, and Cleveland LE. (2008). The USDA Automated Multiple Pass Method reduces bias in the collection of energy intakes. *American Journal of Clinical Nutrition* 88:324-332.

Moshfegh AJ, Rhodes DG, Martin CL. (2021). National food intake assessment – technologies to advance traditional methods. *Annual Review of Nutrition* 42:5.1-5.22.

Powers PM and Hoover LW. (1989). Calculating the nutrient composition of recipes with computers. *Journal of the American Dietetic Association* 89(2):224-232.

Rhodes DG, Adler ME, Clemens JC, Moshfegh AJ. (2017). What we eat in America food categories and changes between survey cycles. *Journal of Food Composition and Analysis* 64:107–111.

Rhodes DG, Murayi T, Clemens JC, Baer DJ, Sebastian RS, Moshfegh AJ. (2013). The USDA AMPM accurately assesses population sodium intakes. *American Journal of Clinical Nutrition* 97:958-64.

Smith JD, Jain N, Bailey RL. (2020). Ready-to-eat cereal fortification: a modelling study on the impact of changing ready-to-eat cereal fortification levels on population intake of nutrients. *Public Health Nutrition* 239120:2165-2178.

U.S. Department of Agriculture, Agricultural Research Service. (2019). *FoodData Central*. Available from: www.fdc.nal.usda.gov. Accessed 2020 June 1.

U.S. Department of Agriculture, Agricultural Research Service. (1975rev). *Agriculture Handbook No. 102. Food Yields Summarized by Different Stages of Preparation.* Available from: https://www.ars.usda.gov/ARSUserFiles/80400530/pdf/ah102.pdf. Accessed 2020 July 1.

U.S. Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. (2007). *USDA Table of Nutrient Retention Factors, Release 6.* Available from: https://www.ars.usda.gov/ARSUserFiles/80400535/Data/retn/retn06.pdf. Accessed 2020 July 1.

U.S. Department of Agriculture, Economic Research Service. *Food Availability (Per Capita) Data System.* Available from: https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/. Accessed 2020 June 1.

U.S. Department of Agriculture, Economic Research Service. *Oil Crops Yearbook.* Available from: https://www.ers.usda.gov/data-products/oil-crops-yearbook.aspx . Accessed 2020

Appendix A. List of Abbreviations

AMPM	USDA Automated Multiple-Pass Method
ARS	Agricultural Research Service
BHNRC	Beltsville Human Nutrition Research Center
FDC	FoodData Central
FDC ID	Unique permanent identifier of a food in FoodData Central
FNDDS	Food and Nutrient Database for Dietary Studies
FSRG	Food Surveys Research Group
MAFCL	Methods and Application of Food Composition Laboratory
NDB No.	Nutrient Databank number
NHANES	National Health and Nutrition Examination Survey
NFS	Not further specified
NS	not specified
QNS	quantity not specified
SAS®	Statistical Analysis System
SR	USDA National Nutrient Database for Standard Reference
USDA	United States Department of Agriculture
WWEIA	What We Eat in America

Appendix B. Number of Food/Beverages by Food and Nutrient Database for Dietary Studies Version

FNDDS version by NHANES survey years	FNDDS 1 (2001-02)	FNDDS 2 (2003-04)	FNDDS 3 (2005-06)	FNDDS 4.1 (2007-08)	FNDDS 5 (2009-10)	FNDDS 2011-12	FNDDS 2013-14	FNDDS 2015-16	FNDDS 2017-18	FNDDS 2019-20
Food codes	6,974	6,940	6,921	7,174	7,253	7,618	8,536	8,690	7,083	**5,624**
added	*n/a*	*70*	*115*	*283*	*99*	*1,156*	*1,197*	*978*	*209*	***361***
discontinued	*n/a*	*104*	*134*	*30*	*20*	*791*	*279*	*824*	*1,816*	***1,820***
Additional descriptions	6,585	6,600	6,801	7,255	7,437	9,791	12,128	14,449	12,953	**10,047**
Nutrients/components	61	63*	64*	65*	65	65	65	65	65	**65**

*Nutrients added by year:
    2007-2008: Vitamin D (D2+D3) (µg)
    2005-2006: Total Choline (mg)
    2003-2004: Added Vitamin E (mg) and Added Vitamin B12 (µg)

Appendix C. FNDDS 2019-2020 Factsheet

Food and Nutrient Database for Dietary Studies 2019-2020

The USDA Food and Nutrient Database for Dietary Studies 2019-2020 (FNDDS) is an application database designed to convert food and beverage portions reported in What We Eat in America, National Health and Nutrition Examination Survey into gram amounts and to determine their nutrient values.

The complete FNDDS 2019-2020 consists of 10 datasets (Access® and SAS®). Select variables available in quick view/search format (Excel®). All available for download at www.ars.usda.gov/nea/bhnrc/fsrg.

Food Descriptions Component

Main Food Descriptions
Primary descriptions for 5,624 foods/beverages *(4,982 foods/642 beverages)*
Unique 8-digit code assigned to each main food description

Additional Food Descriptions
Descriptions for 10,047 additional foods/beverages associated with a specific main food/beverage

Food Portions and Weights Component

Food Weights
Weights (g) for 22,710 portions

Food Portion Descriptions
Descriptions for unit measure of foods/beverages

Nutrients Component

FNDDS Nutrient Values
Nutrient values for food energy and 64 nutrients/food components **(other side of page)** for each food/beverage

Nutrient Descriptions
Descriptions and measurement units for nutrients

Moisture Adjustment
Factors used during calculation of nutrient values for foods/beverages

FNDDS Ingredients
Information used in calculating FNDDS nutrient values per 100g

Ingredient Nutrient Values
Sources of nutrient values - USDA FoodData Central *(accessed 10/2021)* or other sources

Derivation Descriptions
Descriptions for derivation codes defined by USDA FoodData Central *(accessed 10/2021)*

Appendix D. FNDDS 2019-2020 Nutrients and Food Components (unit)

Food energy (kcal)
Protein (g)
Carbohydrate (g)
Fat, total (g)
Alcohol (g)

Sugars, total (g)
Dietary fiber, total (g)
Water (g)

Saturated fatty acids, total (g)
Monounsaturated fatty acids, total (g)
Polyunsaturated fatty acids, total (g)
Cholesterol (mg)

Individual fatty acids:
Saturated fatty acids:
 4:0 Butyric acid (g)
 6:0 Caproic acid (g)
 8:0 Caprylic acid (g)
 10:0 Capric acid (g)
 12:0 Lauric acid (g)
 14:0 Myristic acid (g)
 16:0 Palmitic acid (g)
 18:0 Stearic acid (g)

Monounsaturated fatty acids:
 16:1 Palmitoleic acid (g)
 18:1 Oleic acid (g)
 20:1 Gadoleic acid (g)
 22:1 Erucic/citoleic acid (g)

Polyunsaturated fatty acids:
 18:2 Linoleic acid (g)
 18:3 Linolenic acid (g)
 18:4 Parinaric acid (g)
 20:4 Arachidonic acid (g)
 20:5 n-3 Eicosapentaenoic acid (EPA) (g)
 22:5 n-3 Docosapentaenoic acid (DPA) (g)
 22:6 n-3 Docosahexaenoic acid (DHA) (g)

Vitamin A as retinol activity equivalents (µg)
Retinol (µg)

Carotenoids:
 Carotene, alpha (µg)
 Carotene, beta (µg)
 Cryptoxanthin, beta (µg)
 Lycopene (µg)
 Lutein + zeaxanthin (µg)

Vitamin E as alpha-tocopherol (mg)
 *Added vitamin E (mg) *(added 2003-04)*
Vitamin D (D2 + D3) (µg) *(added 2007-08)*
Vitamin K as phylloquinone (µg)
Vitamin C (mg)
Thiamin (mg)
Riboflavin (mg)
Niacin (mg)
Vitamin B-6 (mg)

Folate, total (µg)
Folate (DFE) (µg)
 Folic acid (µg)
 Food folate (µg)

Vitamin B12 (µg)
 **Added vitamin B12 (µg) *(added 2003-04)*
Choline, total (mg) *(added 2005-06)*

Calcium (mg)
Iron (mg)
Magnesium (mg)
Phosphorus (mg)
Potassium (mg)
Sodium (mg)
Zinc (mg)
Copper (mg)
Selenium (µg)

Caffeine (mg)
Theobromine (mg)

*Represents a synthetic subcomponent of vitamin E and is included in the vitamin E value.
**Represents a fortified subcomponent of vitamin B12 and is included in the vitamin B12 value.

Appendix E. FNDDS 2019-2020 File Relationships

The USDA Food and Nutrient Database for Dietary Studies (FNDDS) converts food and beverages consumed in What We Eat In America (WWEIA), National Health and Nutrition Examination Survey into gram amounts and determines their nutrient values.

The complete FNDDS 2019-2020 consists of 10 datasets linked by primary and secondary data items forming a relational database. The primary link is the food code, indicated with a solid line. Secondary links are portion code, nutrient code, ingredient code, and FDC derivation code indicated with dotted lines.
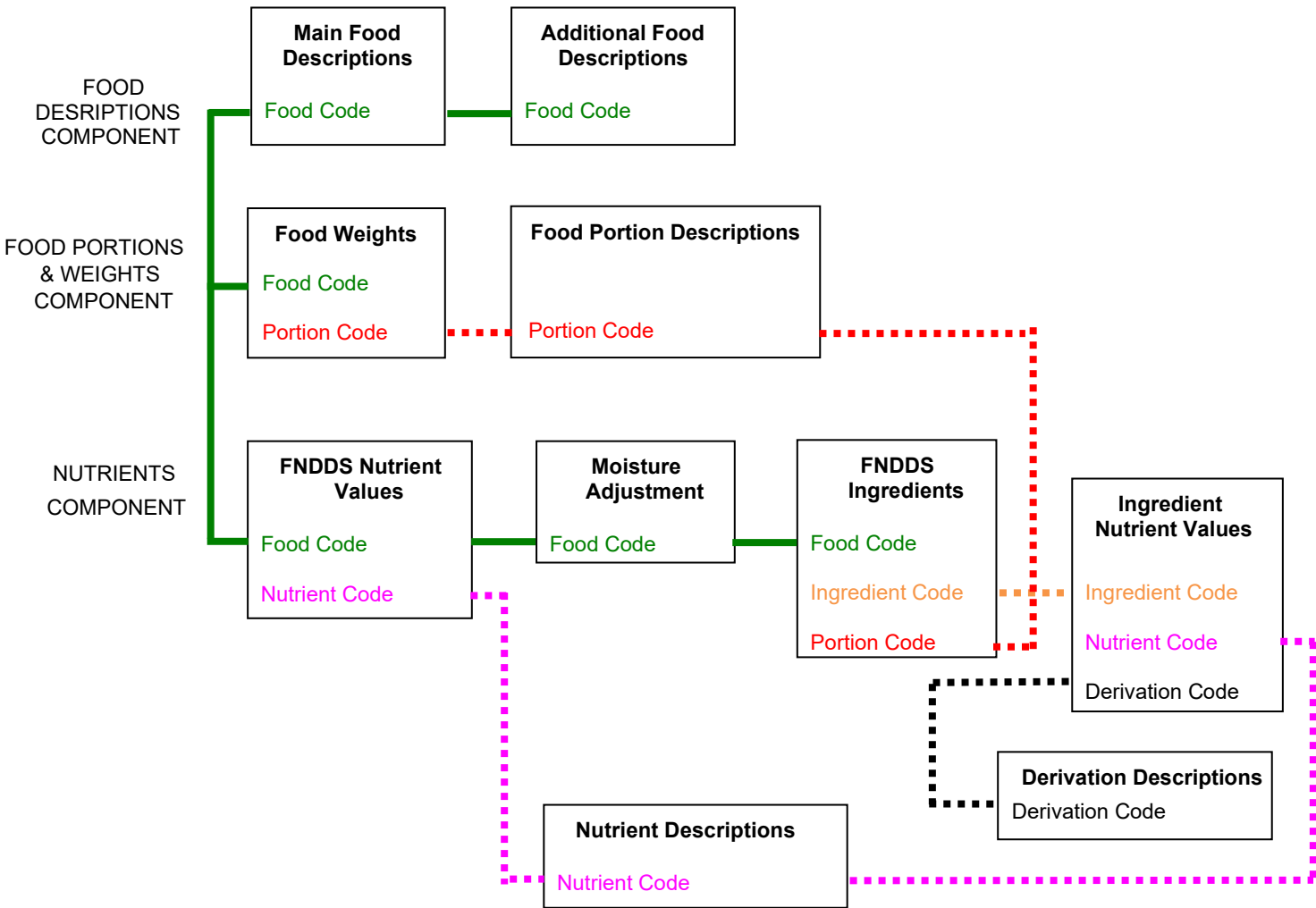
Appendix F. FNDDS 2019-2020 Content of Datasets

2019-2020 Food and Nutrient Database for Dietary Studies

Content of Datasets

The USDA Food and Nutrient Database for Dietary Studies 2019-2020 (FNDDS) is an application database designed to convert food and beverage portions reported in What We Eat in America, National Health and Nutrition Examination Survey into gram amounts and to determine their nutrient values.

The complete FNDDS 2019-2020 consists of 10 datasets (Access® and SAS®). Select variables in quick view and search format also available in Excel®. All available for download at www.ars.usda.gov/nea/bhnrc/fsrg.

Food Descriptions Component

Main Food Descriptions (MainFoodDesc)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Main food description	A 200	Primary description for a food code
WWEIA Category number	N 4	Unique 4-digit identification number
WWEIA Category description	A 80	Description for a WWEIA category

Additional Food Descriptions (AddFoodDesc)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Seq num	N 2	Number for ordering additional food descriptions
Additional food description	A 80	Description(s) associated with a food code/main description

Food Portions and Weights Component

Food Weights (FoodWeights)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Seq num	N 2	Number for ordering portion descriptions
Portion code‡	N 5	Unique 5-digit identification number
Portion weight	N 8.3	Edible portion in grams (g)

Food Portion Descriptions (FoodPortionDesc)

Field Name	Field Type	Description
Portion code‡	N 5	Unique 5-digit identification number
Portion description	A 120	Unit of measure

Nutrients Component

FNDDS Nutrient Values (FNDDSNutVal)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Nutrient code‡	N 5	3-digit identification number
Nutrient value	N 10.x	Amount per 100g edible portion for energy and 64 nutrients

Nutrient Descriptions (NutDesc)

Field Name	Field Type	Description
Nutrient code‡	N 5	3-digit identification number
Nutrient description	A 45	Description of nutrient or food component
Tagname	A 15	INFOODS international food component identifier
Unit	A 10	Measurement unit for nutrient value
Decimals	N 1	Number of decimal places

Moisture Adjustment (MoistAdjust)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Moisture change	N 5.1	Percentage moisture change of total weight

FNDDS Ingredients (FNDDSIngred)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Seq num	N 2	Number for ordering ingredient codes
Ingredient code‡	N 8	NDB number or FNDDS food code
Ingredient description	A 240	Description of NDB number or FNDDS food code
Amount	N 11.3	Number of measures of ingredient code
Measure	A 3	Unit of measure to quantify amount of ingredient code
Portion code‡	N 5	Unique 5-digit identification number
Retention code	N 4	Retention factor identification code
Ingredient weight	N 11.3	Edible portion in grams (g)

Ingredient Nutrient Values (IngredNutVal)

Field Name	Field Type	Description
Ingredient code‡	N 8	Identifies only NDB number
Ingredient description	A 200	Description of NDB number
Nutrient code‡	N 5	3-digit identification number
Nutrient value	N 10.x	Amount per 100g edible portion for energy and 64 nutrients
Nutrient value source	A 80	FDC or other source for nutrient value
FDC ID	N 7	Identifier of food in FDC
Derivation code‡	A 4	Derivation code as defined by FDC
SR AddMod year	N 4	Year value added or last modified as defined by SR
Foundation year acquired	N 4	Initial year acquired as defined by FDC

Derivation Descriptions (DerivDesc)

Field Name	Field Type	Description
Derivation code‡	A 4	Derivation code as defined by FDC
Derivation description	A 120	Description of derivation code

‡ linking field across files
   Note: Start/end dates included on all datasets (except NutDesc and DerivDesc) indicate time period corresponding to WWEIA data.

Appendix G. FNDDS 2019-2020 At A Glance

2019-2020 Food and Nutrient Database for Dietary Studies
At A Glance

The USDA Food and Nutrient Database for Dietary Studies 2019-2020 (FNDDS) is an application database designed to convert food and beverage portions reported in What We Eat in America, National Health and Nutrition Examination Survey into gram amounts and to determine their nutrient values.

At A Glance provides select variables in quick view/search format (Excel®) from the FNDDS 10 datasets (Access® and SAS®). All available for download at www.ars.usda.gov/nea/bhnrc/fsrg.

Food and Beverages

Variable	Description
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
Additional food description	Description(s) associated with a food code/main description
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category

Portions and Weights

Variable	Description
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category
Seq num	Number for ordering portion descriptions
Portion description	Unit of measure
Portion weight	Edible portion in grams (g)

FNDDS Ingredients

Variable	Description
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category
Seq num	Number for ordering ingredient codes
Ingredient code	NDB number or FNDDS food code
Ingredient description	Description of NDB number or FNDDS food code
Ingredient weight	Edible portion in grams (g)
Retention code	Retention factor identification code
Moisture change	Percentage moisture change of total weight

Ingredient Nutrient Values

Variable	Description
Ingredient code	Identifies only NDB number
Ingredient description	Description of NDB number
Nutrient code	3-digit identification number
Nutrient description	Description of nutrient or food component
Nutrient value	Amount per 100g edible portion for energy and 64 nutrients
Nutrient value source	FDC or other source for nutrient value
FDC ID	Identifier of food in FDC
Derivation code	Derivation code as defined by FDC
SR AddMod year	Year value added or last modified as defined by SR
Foundation year acquired	Initial year acquired as defined by FDC

FNDDS Nutrient Values

Variable	Description
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category
Value for each nutrient	Amount per 100g edible portion for energy and 64 nutrients

FDC = FoodData Central (*accessed 10/2021*)

Appendix H. FNDDS 2019-2020 Food Code: Grouping by First 2 Digits

1 Milk and Milk Products
11 *Milks, milk drinks, yogurts, infant formulas*
12 *Creams and cream substitutes*
13 *Milk desserts and sauces*
14 *Cheeses*

2 Meat, Poultry, Fish, and Mixtures
20 *Meat*
21 *Beef*
22 *Pork*
23 *Lamb, veal, game*
24 *Poultry*
25 *Organ meats, frankfurters, sausages, lunchmeats*
26 *Fish, shellfish*
27 *Meat, poultry, fish mixtures*
28 *Frozen meals, soups, gravies*

3 Eggs
31 *Eggs*
32 *Egg mixtures*
33 *Egg substitutes*

4 Dry Beans, Peas, Other Legumes, Nuts, and Seeds
41 *Legumes*
42 *Nuts, nut butters, nut mixtures*
43 *Seeds and seed mixtures*
44 *Carob products*

5 Grain Products
50 *Flour and dry mixes*
51 *Yeast breads, rolls*
52 *Quick breads*
53 *Cakes, cookies, pies, pastries, bars*
54 *Crackers, snack products*
55 *Pancakes, waffles, French toast, other grain products*
56 *Pastas, rice, cooked cereals*
57 *Cereals, not cooked*
58 *Grain mixtures, frozen meals, soups*
59 *Meat substitutes*

6 Fruits
61 *Citrus fruits, juices*
62 *Dried fruits*
63 *Other fruits*
64 *Fruit juices and nectars excluding citrus*
67 *Fruits and juices baby food*

7 Vegetables
71 *White potatoes, starchy vegetables*
72 *Dark-green vegetables*
73 *Orange vegetables*
74 *Tomatoes, tomato mixtures*
75 *Other vegetables*
76 *Vegetables and mixtures mostly vegetables baby food*
77 *Vegetables with meat, poultry, fish*
78 *Mixtures mostly vegetables without meat, poultry, fish*

8 Fats, Oils, and Salad Dressings
81 *Fats*
82 *Oils*
83 *Salad dressings*
89 *'For use' with a sandwich or vegetable*

9 Sugars, Sweets, and Beverages
91 *Sugars, sweets*
92 *Nonalcoholic beverages*
93 *Alcoholic beverages*
94 *Noncarbonated water*
95 *Formulated nutrition beverages, energy drinks, sports drink*
99 *Used as an ingredient, not for coding*

Appendix I. WWEIA Food Categories: Code, Description, Number of FNDDS Codes/Category

MILK AND DAIRY

	Code	Description	
Milk	1002	Milk, whole	7
	1004	Milk, reduced fat	4
	1006	Milk, lowfat	4
	1008	Milk, nonfat	6
Flavored Milk	1202	Flavored milk, whole	10
	1204	Flavored milk, reduced fat	15
	1206	Flavored milk, lowfat	11
	1208	Flavored milk, nonfat	12
Dairy Drinks and Substitutes	1402	Milk shakes and other dairy drinks	13
	1404	Milk substitutes	22
Cheese	1602	Cheese	58
	1604	Cottage/ricotta cheese	16
Yogurt	1820	Yogurt, regular	17
	1822	Yogurt, Greek	14

PROTEIN FOODS

	Code	Description	
Meats	2002	Beef, excludes ground	34
	2004	Ground beef	5
	2006	Pork	27
	2008	Lamb, goat, game	18
	2010	Liver and organ meats	13
Poultry	2202	Chicken, whole pieces	161
	2204	Chicken patties, nuggets and tenders	15
	2206	Turkey, duck, other poultry	48
Seafood	2402	Fish	109
	2404	Shellfish	41
Eggs	2502	Eggs and omelets	147
Cured Meats/Poultry	2602	Cold cuts and cured meats	44
	2604	Bacon	12
	2606	Frankfurters	5
	2608	Sausages	27
Plant-based Protein Foods	2802	Beans, peas, legumes	75
	2804	Nuts and seeds	78
	2806	Processed soy products	20

MIXED DISHES

Category	Code	Description	
Mixed Dishes – Meat, Poultry, Seafood	3002	Meat mixed dishes	263
	3004	Poultry mixed dishes	131
	3006	Seafood mixed dishes	99
Mixed Dishes – Bean/Vegetable-based	3102	Bean, pea, legume dishes	24
	3104	Vegetable dishes	34
Mixed Dishes – Grain-based	3202	Rice mixed dishes	135
	3204	Pasta mixed dishes, excludes macaroni & cheese	175
	3206	Macaroni and cheese	16
	3208	Turnovers and other grain-based items	36
Mixed Dishes – Asian	3402	Fried rice and lo/chow mein	44
	3404	Stir-fry and soy-based sauce mixtures	70
	3406	Egg rolls, dumplings, sushi	25
Mixed Dishes – Mexican	3502	Burritos and tacos	48
	3504	Nachos	7
	3506	Other Mexican mixed dishes	52
Mixed Dishes – Pizza	3602	Pizza	91
Mixed Dishes – Sandwiches (single code)	3702	Burgers	62
	3703	Frankfurter sandwiches	29
	3704	Chicken/turkey sandwiches	21
	3706	Egg/breakfast sandwiches	47
	3720	Cheese sandwiches	14
	3722	Peanut butter and jelly sandwiches	22
	3730	Seafood sandwiches	20
	3740	Deli and cured meat sandwiches	63
	3742	Meat and BBQ sandwiches	20
	3744	Vegetable sandwiches/burgers	11
Mixed Dishes - Soups	3802	Soups	146

GRAINS

Category	Code	Description	
Cooked Grains	4002	Rice	30
	4004	Pasta, noodles, cooked grains	19
Breads, Rolls, Tortillas	4202	Yeast breads	118
	4204	Rolls and buns	37
	4206	Bagels and English muffins	30
	4208	Tortillas	7
Quick Breads and Bread Products	4402	Biscuits, muffins, quick breads	48
	4404	Pancakes, waffles, French toast	54
Ready-to-Eat Cereals	4602	Ready-to-eat cereal, higher sugar (>21.2 g/100g)	22
	4604	Ready-to-eat cereal, lower sugar (=<21.2g/100g)	20
Cooked Cereals	4802	Oatmeal	21
	4804	Grits and other cooked cereals	26

SNACKS AND SWEETS

	Code	Description	
Savory Snacks	5002	Potato chips	27
	5004	Tortilla, corn, other chips	32
	5006	Popcorn	26
	5008	Pretzels/snack mix	45
Crackers	5202	Crackers, excludes saltines	56
	5204	Saltine crackers	5
Snack/Meal Bars	5402	Cereal bars	33
	5404	Nutrition bars	13
Sweet Bakery Products	5502	Cakes and pies	90
	5504	Cookies and brownies	104
	5506	Doughnuts, sweet rolls, pastries	66
Candy	5702	Candy containing chocolate	25
	5704	Candy not containing chocolate	23
Other Desserts	5802	Ice cream and frozen dairy desserts	60
	5804	Pudding	26
	5806	Gelatins, ices, sorbets	17

FRUIT

	Code	Description	
Fruits	6002	Apples	7
	6004	Bananas	2
	6006	Grapes	1
	6008	Peaches and nectarines	6
	6009	Strawberries	3
	6011	Blueberries and other berries	10
	6012	Citrus fruits	11
	6014	Melons	3
	6016	Dried fruits	19
	6018	Other fruits and fruit salads	42
	6020	Pears	5
	6022	Pineapples	5
	6024	Mango and papaya	5

VEGETABLES

	Code	Description	
Vegetables, excluding Potatoes	6402	Tomatoes	6
	6404	Carrots	20
	6406	Other red and orange vegetables	20
	6407	Broccoli	15
	6409	Spinach	15
	6410	Lettuce and lettuce salads	14
	6411	Other dark green vegetables	57
	6412	String beans	20
	6413	Cabbage	11
	6414	Onions	7
	6416	Corn	20
	6418	Other starchy vegetables	42
	6420	Other vegetables and combinations	154
	6430	Fried vegetables	21
	6432	Coleslaw, non-lettuce salads	18
	6489	Vegetables on a sandwich	8
White Potatoes	6802	White potatoes, baked or boiled	48
	6804	French fries and other fried white potatoes	44
	6806	Mashed potatoes and white potato mixtures	56

Appendix I. WWEIA Food Categories: Code, Description, Number of FNDDS Codes/Category
(continued)

BEVERAGES

	Code	Description	
100% Juice	7002	Citrus juice	13
	7004	Apple juice	3
	7006	Other fruit juice	19
	7008	Vegetable juice	9
Diet Beverages	7102	Diet soft drinks	13
	7104	Diet sport and energy drinks	12
	7106	Other diet drinks	6
Sweetened Beverages	7202	Soft drinks	14
	7204	Fruit drinks	54
	7206	Sport and energy drinks	19
	7208	Nutritional beverages	16
	7220	Smoothies and grain drinks	25
Coffee and Tea	7302	Coffee	113
	7304	Tea	45

ALCOHOLIC BEVERAGES

	Code	Description	
Alcoholic Beverages	7502	Beer	7
	7504	Wine	12
	7506	Liquor and cocktails	71

WATER

	Code	Description	
Plain Water	7702	Tap water	2
	7704	Bottled water	1
Flavored or Enhanced Water	7802	Flavored or carbonated water	5
	7804	Enhanced water	2

FATS AND OILS

	Code	Description	
Fats and Oils	8002	Butter and animal fats	14
	8004	Margarine	12
	8006	Cream cheese, sour cream, whipped cream	14
	8008	Cream and cream substitutes	19
	8010	Mayonnaise	10
	8012	Salad dressings and vegetable oils	54

CONDIMENTS AND SAUCES

	Code	Description	
Condiments and Sauces	8402	Tomato-based condiments	12
	8404	Soy-based condiments	10
	8406	Mustard and other condiments	29
	8408	Olives, pickles, pickled vegetables	30
	8410	Pasta sauces, tomato-based	11
	8412	Dips, gravies, other sauces	59

SUGARS

	Code	Description	
Sugars	8802	Sugars and honey	8
	8804	Sugar substitutes	10
	8806	Jams, syrups, toppings	36

BABY FOODS AND FORMULAS

	Code	*Description*	
Baby Foods	9002	Baby food: cereals	14
	9004	Baby food: fruit	13
	9006	Baby food: vegetables	14
	9007	Baby food: mixtures	12
	9008	Baby food: meat and dinners	11
	9010	Baby food: yogurt	2
	9012	Baby food: snacks and sweets	11
Baby Beverages	9202	Baby juice	6
	9204	Baby water	1
Infant Formulas	9402	Formula, ready-to-feed	18
	9404	Formula, prepared from powder	51
Human Milk	9602	Human milk	1

OTHER

Other	9802	Protein and nutritional powders	18
	9999	Not included in a food category	75

Appendix J. FDC Derivation Codes and Descriptions

Code	Description
A	*Analytical data*
AI	*Analytical data; from the literature or government; incomplete documentation*
AR	*Analytical data; derived by linear regression*
AS	*Summed*
BD	*Based on same food; Drained solids from solids and liquids or vice versa (canned fruits and vegetables)*
BFAN	*Based on another form of the food or similar food; Concentration adjustment; Ash; Retention factors not used*
BFCN	*Based on another form of the food or similar food; Concentration adjustment; Carbohydrate; Retention factors not used*
BFFN	*Based on another form of the food or similar food; Concentration adjustment; Fat; Retention factors not used*
BFFY	*Based on another form of the food or similar food; Concentration adjustment; Fat; Retention factors used*
BFNN	*Based on another form of the food or similar food; Concentration adjustment; Non-fat solids; Retention factors not used*
BFNY	*Based on another form of the food or similar food; Concentration adjustment; Non-fat solids; Retentions factors used*
BFPN	*Based on another form of the food or similar food; Concentration adjustment; Protein; Retention factors not used*
BFPY	*Based on another form of the food or similar food; Concentration adjustment; Protein; Retention factors used*
BFSN	*Based on another form of the food or similar food; Concentration adjustment; Solids; Retention factors not used*
BFSY	*Based on another form of the food or similar food; Concentration adjustment; Solids; Retention factors used*
BFYN	*Based on another form of the food or similar food; Concentration adjustment; Yield; Retention factors not used*
BFYY	*Based on another form of the food or similar food; Concentration adjustment; Yield; Retention factors used*
BFZN	*Based on another form of the food or similar food; Concentration adjustment; No adjustment; Retention factors not used*
BFZY	*Based on another form of the food or similar food; Concentration adjustment; No adjustment; Retention factors used*
BNA	*Based on another form of the same food or similar food: constituents normalized to total; vitamin A*
CAAN	*Calculated from different food; From average values for food category; Ash; Retention factors not used*
CAFN	*Calculated from different food; From average values for food category; Fat; Retention factors not used*
CASN	*Calculated from different food; From average values for food category; Solids; Retention factors not used*
CAZN	*Calculated from different food; From average values for food category; No adjustment; Retention factors not used*
DA	*Concentration adjustment using factor; derived from analytical data*
DI	*Concentration adjustment using factor; derived from imputed data*
FLA	*Estimated formulation based on ingredient list; Linear program used to estimate ingredients; Analytical data*
FLC	*Estimated formulation based on ingredient list; Linear program used to estimate ingredients; Claim on label/serving*
FLM	*Estimated formulation based on ingredient list; Linear program used to estimate ingredients; Manuf. Calc. data/100*
JA	*Aggregated data involving combinations of data with only source codes[*] 1 and 12 and/or 13*
JO	*Aggregated data involving combinations of data with different source codes[*] when at least one code is not 1, 6, 12, or 13*
LC	*Label claim (back calculated from label by NDL staff; Calculated from label claim/serving (g or %RDI)*
MA	*Manufacturer supplied(industry or trade association); Analytical data, incomplete documentation*
MC	*Manufacturer supplied; Calculated by manufacturer or unknown if analytical or calculated*
ML	*Manufacturer supplied; Value upon which manufacturer based label claim for fortified/enriched nutrient*

Appendix J. FDC Derivation Codes and Descriptions *(continued)*

Code	Description
NC	*Calculated*
NP	*Nutrient that is based on other nutrient/s; calculated by difference or summed (with or without activity factors) Ex. Proximate component other than CHO by difference. Vitamin A calculated from components when one of the component values is not source code* 1 or 7*
NR	*Nutrient that is based on other nutrient/s; value used directly, ex. Nut.#204 from Nut.#298*
O	*Other procedure used from imputing*
PAE	*Based on physical composition; Derived from analytical data; Estimated physical composition*
PAK	*Based on physical composition; Derived from analytical data; Known physical composition*
PIE	*Based on physical composition; Derived from imputed data; Estimated physical composition*
PIK	*Based on physical composition; Derived from imputed data; Known physical composition*
RA	*Recipe; Approximate ingredient proportions (ex. combination of several recipes)*
RC	*Recipe; Cookbook*
RF	*Recipe; Formulary of standard products (formulary or standards of identity)*
RK	*Recipe; Known formulation (dissection data or proprietary formulation)*
RKA	*Recipe; Known formulation; No adjustments applied, combination of source codes* 1, 12, and/or 6*
RKI	*Recipe; Known formulation; No adjustments applied, combination of source codes* which includes codes other than 1,12,or 6*
RP	*Recipe; Per package directions (ex. refrigerated dough, toast, cake mix)*
RPA	*Recipe; Per package directions; No adjustments applied, combination of source codes* 1, 12, and/or 6.*
RPI	*Recipe; Per package directions; No adjustments applied, combination of source codes which includes codes* other than 1,12,or 6*
S	*Product standard, such as enrichment level specified in CFR or AMS commodity standard*
T	*Taken from another source--other tables of food composition*
Z	*Assumed zero (Insignificant amount or not naturally occurring in a food, such as fiber in meat)*

Source: U.S. Department of Agriculture, Agricultural Research Service. (2021). FoodData Central. Available from: www.fdc.nal.usda.gov. Accessed 10/2021.

*Source code descriptions:
 1 - analytical or derived from analytical
 6 - aggregated data involving combinations of source codes 1 & 12
12 - manufacturer's analytical, partial documentation
13 - analytical data from the literature, partial documentation

Appendix K. Nutrient Codes in FNDDS and FoodData Central

Nutrient Code	Nutrient Description	FDC Nutrient ID	Nutrient Code	Nutrient Description	FDC Nutrient ID
203	Protein	1003	601	Cholesterol	1253
204	Total Fat	1004	606	Fatty acids, total saturated	1258
205	Carbohydrate	1005	607	4:0 (Butyric acid)	1259
208	Energy	1008/2047	608	6:0 (Caproic acid)	1260
221	Alcohol	1018	609	8:0 (Caprylic acid)	1261
255	Water	1051	610	10:0 (Capric acid)	1262
262	Caffeine	1057	611	12:0 (Lauric acid)	1263
263	Theobromine	1058	612	14:0 (Myristic acid)	1264
269	Sugars, total	2000/1063	613	16:0 (Palmitic acid)	1265
291	Fiber, total dietary	1079	614	18:0 (Stearic acid)	1266
301	Calcium	1087	617	18:1 (Oleic acid)	1268
303	Iron	1089	618	18:2 (Linoleic acid)	1269
304	Magnesium	1090	619	18:3 (Linolenic acid)	1270
305	Phosphorus	1091	620	20:4 (Arachidonic acid)	1271
306	Potassium	1092	621	22:6 n-3 (Docosahexaenoic acid - DHA)	1272
307	Sodium	1093	626	16:1 (Palmitoleic acid)	1275
309	Zinc	1095	627	18:4 (Parinaric acid)	1276
312	Copper	1098	628	20:1 (Gadoleic acid)	1277
317	Selenium	1103	629	20:5 n-3 (Eicosapentaenoic acid - EPA)	1278
319	Retinol	1105	630	22:1 (Erucic/citoleic acid)	1279
320	Vitamin A, RAE	1106	631	22:5 n-3 (Docosapentaenoic acid - DPA)	1280
321	Carotene, beta	1107	645	Fatty acids, total monounsaturated	1292
322	Carotene, alpha	1108	646	Fatty acids, total polyunsaturated	1293
323	Vitamin E (alpha-tocopherol)	1109			
328	Vitamin D (D2 + D3)	1114			
334	Cryptoxanthin, beta	1120			
337	Lycopene	1122			
338	Lutein + zeaxanthin	1123			
401	Vitamin C	1162			
404	Thiamin	1165			
405	Riboflavin	1166			
406	Niacin	1167			
415	Vitamin B6	1175			
417	Folate, total	1177			
418	Vitamin B12	1178			
421	Choline, total	1180			
430	Vitamin K (phylloquinone)	1185			
431	Folic acid	1186			
432	Folate, food	1187			
435	Folate, DFE	1190			
573	Vitamin E, added	1242			
578	Vitamin B12, added	1246			

Appendix L. FNDDS 2019-2020 Nutrient Value Sources

Nutrient Value Source	Description
Assumed zero	Based on related nutrient value of same product or similar product
Foundation	FoodData Central Foundation Food *downloaded October 2021*[1]
Foundation code xxxxx	Imputed nutrient value from other Foundation Food NDB number listed
Foundation fdc_id xxxxx	Based on specific subsample value for Foundation Food NDB number
Informed by label/other sources	Based on nutrient values in FoodData Central USDA Global Branded Food Products Database[1], company websites or similar products
Informed by FDC Foundation and SR Legacy	Based on nutrient values of FoodData Central Foundation Food and/or SR Legacy NDB number
Nutrient as ingredient	Ingredient code xxxxxx for nutrient used as ingredient
SR Legacy	FoodData Central SR Legacy *downloaded October 2021*[1]
SR Legacy code xxxxx	Imputed nutrient value from other SR Legacy NDB number listed
SR Legacy code xxxxx footnote	Reflects seafood product not treated with sodium
SR 26	SR 26 database *downloaded October 2015*
SR 28	SR 28 database *downloaded October 2017*[2]
SR 28 *downloaded October 2015*	Earlier version of SR 28 *downloaded October 2015*

[1] Link to FDC download October 2021 on FSRG website *www.ars.usda.gov/nea/bhnrc/fsrg*
[2] Link to SR28 download October 2017 on FSRG website *www.ars.usda.gov/nea/bhnrc/fsrg*