

2021-2023 Food Patterns Equivalents Database Documentation



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Glossary of Abbreviations

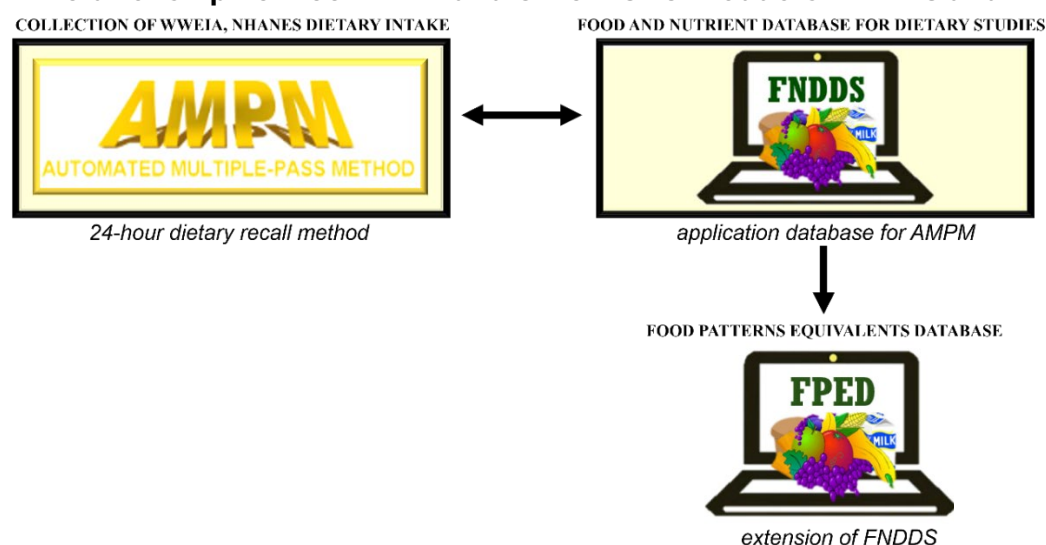
ARS	Agricultural Research Service
AMPM	USDA Automated Multiple-Pass Method
CDC	Centers for Disease Control and Prevention
Cup eq.	Cup equivalents
FPED	Food Patterns Equivalents Database
FPID	Food Patterns Equivalents Ingredients Database
FNDDS	Food and Nutrient Database for Dietary Studies
FSRG	Food Surveys Research Group
MPED	MyPyramid Equivalents Database
NFS	Not further specified
NHANES	National Health and Nutrition Examination Survey
Oz. eq.	Ounce equivalents
SAS	Statistical Analysis System
SR	USDA National Nutrient Database for Standard Reference Legacy
Tsp. eq.	Teaspoon equivalents
USDA	United States Department of Agriculture
WWEIA	What We Eat in America

FPED PURPOSE AND KEY POINTS

The Food Patterns Equivalents Database (FPED) converts the foods and beverages in the Food and Nutrient Database for Dietary Studies (FNDDS) to 37 USDA Food Patterns components. The FPED 2021-2023 is specifically intended to assess What We Eat in America (WWEIA), NHANES, August 2021-August 2023.

FPED is an extension of the characteristics of foods/beverages in the USDA FNDDS, used in national dietary surveillance (Figure 1) (USDA, ARS, FSRG, 2024). Since 2000, WWEIA, the dietary intake component of NHANES, has collected and reported on the dietary intake of the US population (USHHS, CDC, NCHS 2024). The dietary collection method used is the USDA Automated Multiple-Pass Method (AMPM) (USDA, ARS, FSRG 2021). FNDDS, a companion database component to the AMPM, contains data to convert foods and their amounts reported in the AMPM into gram amounts and determine their nutrient values. Interrelated, the AMPM questions and response options are the basis for foods and their portion options in FNDDS. New versions of FNDDS are released by the Food Surveys Research Group (FSRG) with each 2-year NHANES cycle. In addition, versions of FPED are released and detailed in [Appendices 1 and 2](#).

Figure 1. Relationship Between FPED and Other FSRG Products: FNDDS and AMPM



FPED Key Points:

- FPED contains 37 food patterns components. The 37 components are categorized into 9 main components. (**Table 1**).
- FPED defines the quantity of 37 components/100 g of food/beverage in FNDDS.
- FPED defines portion amounts of various food forms in a component into standardized equivalents to allow for consistent analysis (e.g., cup of milk, cup of yogurt, slice of cheese). FPED amounts may not be the same as FNDDS portion weights, typical serving size or the Food and Drug Administration's Reference Amounts Customarily Consumed.
- Units of measure vary depending on component (e.g., cup equivalent, ounce equivalent).
- Beans, Peas, and Lentils can be either Vegetables or Protein Foods components.

Table 1. Food Patterns Equivalents Database Components and Units of Measurement

Main Components	Components	Unit of Measurement
Fruit	Total Fruit	Cup equivalents
	Citrus, Melons, and Berries	
	Other Fruits	
	Fruit Juice	
Vegetables	Total Vegetables	Cup equivalents
	Dark Green Vegetables	
	Total Red and Orange Vegetables	
	Tomatoes	
	Other Red and Orange Vegetables (<i>excludes tomatoes</i>)	
	Total Starchy Vegetables	
	Potatoes (<i>white potatoes</i>)	
	Other Starchy Vegetables (<i>excludes white potatoes</i>)	
	Other Vegetables	
Grains	Beans, Peas, and Lentils (<i>as Vegetables</i>)	Ounce equivalents
	Total Grains	
	Whole Grains	
	Refined Grains	
Protein Foods	Total Protein Foods	Ounce equivalents
	Total Meat, Poultry, and Seafood	
	Meat (<i>beef, veal, pork, lamb, goat, game</i>)	
	Cured Meat (<i>frankfurters, sausages, corned beef, cured ham, luncheon meat made from beef, pork, poultry</i>)	
	Organ Meat (<i>from beef, veal, pork, lamb, game, poultry</i>)	
	Poultry (<i>chicken, turkey, other birds</i>)	
	Seafood High in <i>n</i> -3 Fatty Acids	
	Seafood Low in <i>n</i> -3 Fatty Acids	
	Eggs	
	Soy Products (<i>includes tofu, meat alternatives, soy in bars/ powders; excludes soy milk, soy yogurt</i>)	
	Nuts and Seeds	
Dairy	Beans, Peas, and Lentils (<i>as Protein Foods</i>)	Cup equivalents
	Total Dairy	
	Milk (<i>includes soy milk</i>)	
	Yogurt (<i>includes soy yogurt</i>)	
	Cheese	
Oils	Oils	Gram equivalents
Solid Fats	Solid Fats	Gram equivalents
Added Sugars	Added Sugars	Teaspoon equivalents
Alcoholic Drinks	Alcoholic Drinks	Number of drinks

FPED 2021-2023 DEVELOPMENT

Guiding Principles

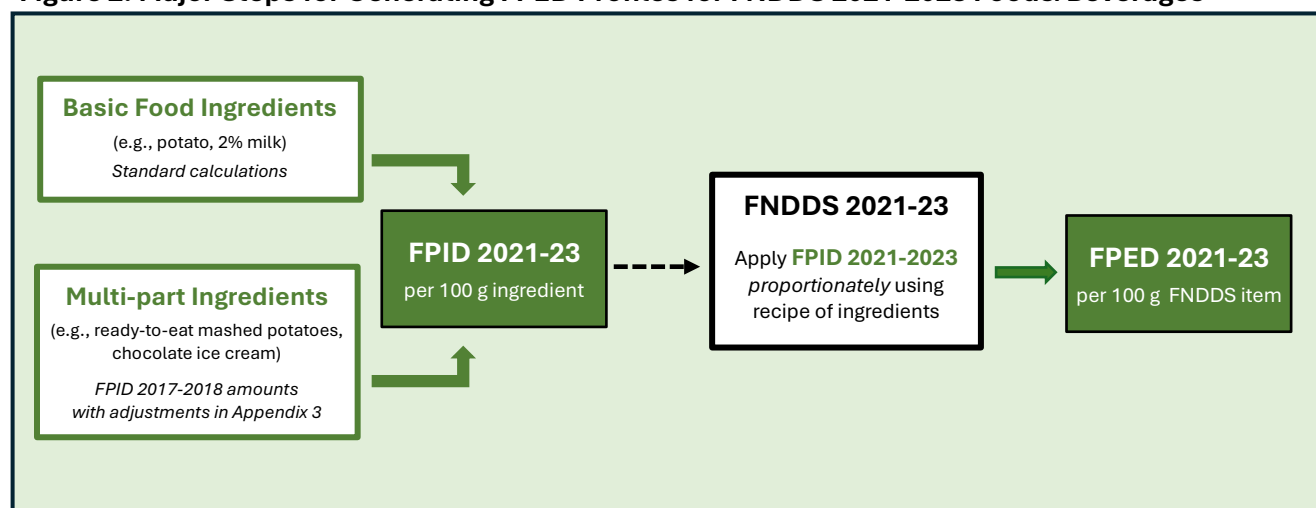
The development of FPED 2021-2023 utilized a standardized methodology that reflects the inherent similarities within food categories. The following principles guided development:

- FPED is an extension of FNDDS, and components are assigned based on associated FNDDS recipes of compiled ingredients.
- Ingredients in FNDDS recipes are selected to build a nutrient profile for a food and do not necessarily represent the exact ingredients in a product. These ingredients form the basis of the Food Patterns Equivalents Ingredient Database (FPID) that is used to build FPED.
- Select adjustments are made to FPED.

Major Steps

1. **Calculate** component amounts/100 g for ingredients in FNDDS recipes by two processes.
 - **Basic food ingredients** (e.g., potato, 2% milk), from 1,152 Foundation Food and Standard Reference (SR) codes representing **2/3** of ingredients – These codes use one or two FPID component determinations for that food.
 - **Multi-part ingredients** (e.g., ready-to-eat mashed potatoes, chocolate ice cream), from 568 SR codes representing **1/3** of ingredients – These SR codes representing more complex food types must be further broken down into assumed basic ingredients to calculate multiple components. They use component amounts from FPID 2017-2018 with adjustments detailed in **Appendix 3**. Adjustments include the application of generic percentages of a) refined and whole grains and b) oils and solid fats to groups of similar foods.
2. **Compile** ingredients into FPID which provides component amounts/100 g for 1,720 ingredients.
3. **Calculate** FPED profiles/100 g for 5,432 FNDDS foods/beverages using FPID ingredients based on FNDDS recipes.

Figure 2. Major Steps for Generating FPED Profiles for FNDDS 2021-2023 Foods/Beverages



New for FPED 2021-2023 – Additional Changes

Incorporation of Changes from Both FNDDS 2019-2020 and FNDDS 2021-2023

- FPED specifically for FNDDS 2019-2020 not feasible for analysis because of combined NHANES cycles (USDA, ARS, FSRG 2023).

Removal of Whey from Total Dairy Component

- High variability in amounts of whey in different nutritional bars and powders and therefore difficult to estimate for generic FNDDS foods/beverages
- Minimal impact on Total Dairy intakes based on internal analysis

Rounding Values to One Decimal

- Order of rounding: rounding of FPID values, followed by rounding of FPED values
- Prior, rounding of values to two decimal places after all calculations
- Rounding change due to generic representation of foods/beverages in FNDDS, and no meaningful impact on FPED component intakes using WWEIA data

Ingredients and FNDDS Foods/Beverages with No Food Patterns Components

Several ingredients and FNDDS foods/beverages do not have food patterns components because they do not fit into food groups (**Table 2**).

Table 2. Ingredients and FNDDS Foods/Beverages with No Food Patterns Components*

Cooking/Commercial Ingredients	Beverages with No/Low-calorie Sweeteners	Sugar-free Desserts
Broth	Coconut water	Candy and gum
Cornstarch	Coffee and tea	Gelatin
Dry tapioca	Energy drinks	Non-fat frozen desserts
Gelatin	Flavored drink powder	Pudding
Hot sauce	Human milk	
Leavening agents	Infant formulas	
Lemon peel	Non-alcoholic wine	
Low calorie sweeteners	Plain and flavored water	
Soy/oyster sauce	Soft drinks/fruit juice drinks with assumed 3% juice	
Spices	Whey/milk-based protein powders and drinks	
Vinegar		
Whey		

*Detailed in FPED/FPID 2021-2023 per 100 g files: variable “NO_COMPONENTS”, value = “None”.

Calculating FPID Components

Basic food ingredients with one or two components – calculated based on gram weight for 1 measure unit (e.g., 1 cup equivalent, 1 ounce equivalent) and then unit measure converted and reported on a per 100 g basis

Example: 1 cup of baked potato weighs 120 g = 0.8 cup equivalents of potato/100 g.

1 cup of potato chips weighs 57 g = 1.8 cup equivalents of potato/100g.

Potato chips have 34g total fat/100 g = 34 gram equivalents of oils/100 g.

Multi-part ingredients comprised of more than one basic food ingredient and containing multiple components – component amounts primarily based on prior FPID 2017-2018 amounts with adjustments detailed in [Appendix 3](#)

Example: Ready-to-eat mashed potatoes contain 0.6 cup equivalents of potato. 3.8 g oils, and 1.3 g solid fats/100 g.

Calculating FPED Components

FNDDS foods/beverages – amounts of components present in each ingredient of FNDDS food/beverage proportionately totaled per 100 g of food with adjustments for moisture gain/loss

Table 3 displays assumptions and calculations from individual ingredients to final FPED profile for FNDDS beverage *Frozen mocha coffee drink*.

Table 3. Developing FPED Profile for FNDDS Code 92102000: Frozen Mocha Coffee Drink

FNDDS Recipe		FPID Components and Calculations				FPED Calculations	
Ingredients	Amount (g/100 g)	Component	Amount ¹ (g/100 g)	One eq (g)	FPID eq/100 g	Amount (%)	FPED eq/100 g ²
Granulated Sugar	4.6	Added sugars	99.8	/ 4.2 g/tsp eq	= 23.8 tsp eq	x .046	= 1.1 tsp eq
Chocolate Syrup ³	9.1	Added sugars	60	/ 4.2 g/tsp eq	= 14.3 tsp eq	x .091	= 1.3 tsp eq
2% Milk	44.4	Milk	100	/ 245 g/cup eq	= 0.4 cup eq	x .444	= 0.2 cup eq
		Solid fats	*	*	1.3 g*	x .444	= 0.6 g
Coffee	15	No components					
Water	26.9	No components					

¹ Gram amount of component/100 g from which equivalent is derived (e.g., 99.8% of granulated sugar and 60% of chocolate syrup are added sugars, 100% of 2% milk is dairy)

² FPED equivalent/100 g based on ingredient proportion of FNDDS recipe times FPID equivalent/100 g; summing of component amounts for FPED profile (e.g., 1.1 tsp eq + 1.3 tsp eq = 2.4 tsp eq added sugar)

³ Remaining ingredients in chocolate syrup assumed to have no components (e.g., cocoa powder, water)

* Solid fats in dairy defined as excess of 1.5 g total fat/dairy cup equivalent. Calculated as:

1.9 g total fat in 100 g of 2% milk; 1 cup eq of milk = 245 g

(245 g / 100 g) * 1.9 g = 4.655 g **total fat** in 1 cup eq of 2% milk

4.655 g **total fat** – 1.5 g **allowable fat** = 3.155 g solid fat in 1 cup eq of 2% milk

(100 g / 245 g) * 3.155 g = **1.3 g solid fat/100 g 2% milk**

FPED 2021-2023 RELEASE FILES

FPED 2021-2023 release files are available on FSRG website www.ars.usda.gov/nea/bhnrc/fsrg:

Table 4. FPED 2021-2023 Release Files and Descriptions

File Type	File Description
Documentation	Documentation of determination and calculations of components for FNDDS foods/beverages and ingredients
FPED 2021-2023 per 100 g	Amounts of 37 components/100 g of FNDDS foods/beverages Available in Excel®, Access®, and SAS®
FPID 2021-2023 per 100 g	Amounts of 37 components/100 g of ingredients in FNDDS recipes Available in Excel®, Access®, and SAS®
Individual food intake of FPED components	Component amounts in each food/beverage reported per respondent, WWEIA, NHANES August 2021-August 2023 Day 1 and Day 2 intake SAS® files
Total daily intake of FPED components	Total daily component amounts per respondent, WWEIA, NHANES August 2021-August 2023 Day 1 and Day 2 intake SAS® files
Variable descriptions	Variable names/descriptions for Day 1 and Day 2 intake files
Summarized data tables	Mean daily intakes of components per individual by: Male/Female and Age Race/Ethnicity and Age Family Income as % of Poverty Level and Age
FPED 2021-2023 Cup weights	One cup equivalent weights for fruit, vegetables and dairy
Analysis examples	SAS code to produce mean intake estimates of select components Instructions for SAS code examples
FNDDS 2021-2023	Food and Nutrient Database for Dietary Studies 2021-2023

Food Patterns Components and Determination of Equivalents

FRUIT

Components

1. **Total Fruit**
2. Citrus, Melons, and Berries
3. Other Fruit
4. Fruit Juice

Definition Examples – One Cup Equivalent

- 1 cup of raw, canned, or frozen fruit
- 1 cup of 100% fruit juice
- 1/2 cup of dried fruit

Determination of Cup Equivalent Weights

- Fruit cup weights (except juices) rounded to nearest five grams (**Table 6**)
- Calculations for canned fruit and fruit juices in beverages in **Table 5**

Table 5. Fruit - Calculation Assumptions¹

Canned Fruit (undrained)	
Fruit canned in water or syrup	65% fruit
Fruit canned in juice	65% fruit, 35% juice
Fruit Juices in Beverages	
Light fruit juice	50% juice
Fruit nectars	40% juice
Fruit juice drinks ²	15% juice

¹ Percentages based on food label data and product information, FDA standards (USHHS, FDA, 2026), and USDA's Food Yields Summarized by Different Stages of Preparation (USDA, ARS, 1975).

² Select drinks assumed to have 3% juice and have no fruit juice component due to rounding (See Table 2).

Table 6. Fruit – Examples of One Cup Equivalent Weights (g) ¹

	Raw/Not Specified	Frozen	Canned, with Liquid ²	Dried
Citrus, Melons, and Berries				
Berries, NFS	145			
Blackberries	145	150		
Blueberries	145	150	385	65
Cantaloupe	170			
Clementine	210			
Cranberries	145			65
Grapefruit	210		385	
Honeydew melon	170			
Kiwi fruit	175			
Kumquat	185			
Lemon	210			
Lime	210			
Melon, NFS		170		
Orange	185		385	
Raspberries	145	150		
Strawberries	145	150	385	
Tangerine	185		385	
Watermelon	150			
Other Fruit				
Apple	110			45
Applesauce	245		245	
Apricot	165		385	65
Baby food fruit	245			
Banana	150			50
Cherries	155	155	385	65
Currants				75
Date				75
Dragon fruit	175			
Dried fruit, not specified				70
Fig	255		385	75
Fruit cocktail			385	
Grapes	150			
Guava	165			
Lychee	190			
Mango	165	165	385	65
Nectarine	145			
Papaya	140			70
Passion fruit	235			

Table 6 (continued)

	Raw/Not Specified	Frozen	Canned, with Liquid**	Dried
Peach	155	150	385	80
Pear	165		385	90
Persimmon	165			80
Pineapple	165	165	385	70
Plum	165		385	
Pomegranate	155			
Prune				85
Raisins				75
Rhubarb	120			
Starfruit	140			
Tamarind	120			
Fruit Juice				
100% Fruit juice	250			
100% Fruit juice concentrate	70			
Light fruit juice (contains 50% juice)	500			
Fruit nectars (contains 40% juice)	625			
Fruit juice drinks (contains 15% juice)	1667			
Juice from fruit canned in fruit juice (contains 35% juice)			714	

¹ Weights averaged for various cuts - sliced, diced, chopped

² Gram amounts reflect the amount of entire can contents to result in 1 cup equivalent of fruit and 1 cup equivalent of fruit juice (if packed in fruit juice). The assumed can contents are 65% fruit (except applesauce), and 35% fruit juice (if packed in fruit juice).

VEGETABLES

Components

5. **Total Vegetables**
6. Dark Green Vegetables
7. Total Red and Orange Vegetables
8. Tomatoes
9. Other Red and Orange Vegetables *excludes tomatoes*
10. Total Starchy Vegetables
11. Potatoes *white potatoes*
12. Other Starchy Vegetables *excludes white potatoes*
13. Other Vegetables
14. Beans, Peas and Lentils (*as Vegetables*)

Definition Examples – One Cup Equivalent

- 1 cup of raw, cooked, canned, or frozen vegetables
- 1 cup of cooked beans, peas, and lentils
- 1 cup of vegetable juice
- 2 cups of raw, leafy vegetables
- 1/2 cup of dried vegetables

Additional Considerations

In assessment, **Beans, Peas, and Lentils** can be either **Vegetables** or **Protein Foods** but not both.

- Considered as Vegetables = cup equivalents
- Considered as Protein Foods = ounce equivalents
- **1 cup equivalent** of Vegetables = **4 ounce equivalents** of Protein Foods
- Cup Equivalents for Beans, Peas, and Lentils not included in Total Vegetables component

Determination of Cup Equivalent Weights

- Vegetable cup weights (except dried) rounded to nearest five grams (**Table 8**)
- Different cup equivalent weights for cooked vegetables versus raw due to the loss of moisture and structural integrity
- Uncooked beans/peas/lentils cup weight based on a conversion factor of 0.33 cooked food to uncooked per the USDA Food Intakes Converted to Retail Commodities Database, 2003-08 (Bowman, et. al. 2013c)

Table 7. Vegetables – Calculation Assumptions

Vegetable Juices	
100% vegetable juice	Assigned to primary vegetable category, cup weight 245 g
Vegetable juice drinks	Assigned within multi-part ingredient process (Appendix 3) as these drinks also contain fruit juice

Table 8. Vegetables – Examples of One Cup Equivalent Weights (g)*

	Cooked from:		
	Raw/Not Specified	Fresh/Not Specified	Frozen/Canned
Baby food vegetables – 225 g			
Total Dark Green Vegetables			
Arugula	40		
Basil	40		
Beet greens	75	145	
Bitter melon, horseradish, jute, or radish leaves		125	
Broccoli	80	155	155
Broccoli raab	80	155	
Chard	70	150	
Chinese Cabbage	140	170	
Cilantro	30		
Collards	70	130	165
Cress	100	135	
Dandelion greens	110	110	
Escarole		130	
Grape leaves	30		
Greens, not specified		145	160
Kale	40	130	165
Lambsquarters		180	
Lettuce, Boston	110		
Lettuce, green or red leaf	70		
Lettuce, romaine	95		
Mustard greens	110	140	150
Parsley	120		
Poke greens		155	
Spinach	70	150	170
Sweet potato, squash, pumpkin, chrysanthemum, or bean leaves		65	
Taro leaves	60	145	
Turnip greens		145	160
Watercress	70	135	
Tomatoes			
Tomatoes	170	240	240
Tomatoes, dried	25		
Tomato juice (100% juice)	245		
Tomato paste or puree			120
Tomato sauce			245
Tomato and vegetable juice (100% juice)	245		

Table 8 (continued)

		Cooked from:	
	Raw/Not Specified	Fresh/Not Specified	Frozen/Canned
Other Red and Orange Vegetables			
Carrots	125	145	145
Carrot juice (100% juice)	245		
Pimiento	190		190
Pumpkin	115	245	245
Red- and orange-colored peppers	120	135	
Sweet potatoes	130	200	200
Sweet potatoes, baked		200	
Sweet potato chips	57		
Winter squash	115	205	
Winter squash, baked		205	
Potatoes			
French fries		155	155
White potatoes	150	155	155
White potatoes, baked		120	
White potato, flour or flakes	30		
White potato chips	57		
Other Starchy Vegetables			
Blackeyed peas, immature			170
Breadfruit	220	250	
Burdock	120	125	
Cassava (Yuca blanca)	130	130	
Corn, sweet	150	165	165
Corn, cream style	255		
Green peas	145	160	160
Hominy		165	165
Jicama (Yam beans)	130		
Lima beans, immature			170
Lotus root		120	
Parsnips		155	
Plantains	150	150	
Plantains, cooked with oil		170	
Plantain chips	57		
Salsify		135	
Taro	105	130	
Taro chips	57		
Water chestnuts		160	160

Table 8 (continued)

	Raw/Not Specified	Cooked from:	
		Fresh/Not Specified	Frozen/Canned
Other Vegetables			
Alfalfa sprouts	35		
Artichoke	150	175	
Asparagus	135	180	
Avocado	145		
Bamboo shoots		150	150
Beans (green, yellow, snap, string)	110	125	135
Bean sprouts	105	125	
Beets	135	170	170
Beet juice (100% juice)	245		
Bitter melon (balsam pear)		125	
Broccoflower	110	125	
Brussels sprouts	90	155	
Cabbage	90	150	
Cactus (Nopales)	150	150	
Capers			135
Cauliflower	110	125	125
Celery	120	150	
Celery juice (100% juice)	245		
Chayote (Christophine)	130	160	
Chives	50		
Cucumber	120	180	
Eggplant	80	95	
Fennel bulb	85	85	
Garlic	135	135	
Ginger root	95		
Kohlrabi	135	165	
Leeks	90	170	
Lettuce, iceberg or not specified	110	110	
Mixed vegetable juice (other than tomato) (100% juice)	245		
Mushrooms	70	155	155
Mushrooms, Asian, from dried		145	
Okra	115	160	170
Olives	135		
Onions	160	210	
Onions, pearl		185	210
Onions, spring/green	100	220	
Palm hearts	145	145	

Table 8. (continued)

	Raw/Not Specified	Cooked from:	
		Fresh/Not Specified	Frozen/Canned
Peppers, not red or orange	120	135	
Pokeberry shoots		165	
Radicchio	80		
Radish	125		
Rutabaga	140	170	
Sauerkraut	140		140
Seaweed	80	80	
Seaweed, dried	10		
Snow peas	100	160	
Spaghetti squash		155	
Squash blossom		105	
Squash blossom, boiled		135	
Summer squash	115	180	180
Tomatoes, green	170		
Turnips	130	155	
Winter melon		175	
Beans, Peas, and Lentils as Vegetables			
	Raw/Not Specified	Cooked from:	
		Dried/Not Specified	Canned
Beans, not specified		175	
Black beans	60	175	175
Blackeyed peas, from dried		175	
Chickpeas (Garbanzo beans)	60	175	175
Edamame		175	175
Fava beans		175	
Kidney beans		175	175
Lentils	60	175	175
Lima beans, from dried		175	
Mung beans		175	
Mung bean noodles	60		
Papad	60		
Peruvian (yellow) beans		175	
Pink beans		175	
Pinto beans		175	175
Refried beans		175	175
Soybeans, mature		175	
Split peas		175	
White beans		175	175

* Weights averaged for various cuts - sliced, diced, chopped

GRAINS

Components

15. **Total Grains**
16. Whole Grains
17. Refined Grains

Whole grains contain entire grain kernel (bran, germ, and endosperm).

Refined grains do not contain entire grain kernel.

Definition Examples – One Ounce Equivalent

- 1 standard slice of bread
- 1 cup of ready-to-eat cereal, ½ cup of cooked cereal
- ½ cup of cooked rice or other cooked grain

Determination of Ounce Equivalent Weights

- Estimation based on amount of flour or uncooked grain present for a systematic approach (**Table 9**).
- Food groupings by examples of one ounce of grain equivalents in **Table 10**.

Table 9. Grains – Calculation Assumptions

Foods Made with Flour	
Each 16 g of flour assumed in food defined as one ounce equivalent	Based on 16 g of flour in one standard slice of bread
Foods Made with Intact Grain	
Each 28.35 g of uncooked grain assumed in food defined as one ounce equivalent	Based on 28.35 g of uncooked grain in ½ cup of cooked grain/cereal or 1 cup of ready-to-eat cereal
Cooked pasta	70.88 g one ounce equivalent (28.35 g * 2.5) due to water expansion
Cooked rice	82.22 g one ounce equivalent (28.35 g * 2.9) due to water expansion

Table 10. Foods - Examples of One Ounce Equivalent Weight of Grain

Assumed with Flour				
Bagels	Chips/Pretzels	Doughnuts	Pie crust	16 g Flour
Biscuits	Cookies	Gravies/sauces	Tortillas	
Breads and rolls	Crackers	Muffins/quick breads		
Cakes	Danishes	Pancakes/waffles		
Assumed with Intact Grain				
Barley	Couscous	Pasta	Ready-to-eat cereals	28.35 g Intact Grain
Buckwheat	Hot cereals	Popcorn	Rice	
Bulgur	Millet	Quinoa		

Determination of Whole Grains and/or Refined Grains

- **Table 11** shows types of grains considered as whole grains and refined grains.
- Multi-part ingredients and FNDDS items **may contain both** whole and refined grains.
- **Ready-to-eat cereals** – 5 percentage levels (0%, 25%, 50%, 75%, or 100%) of whole grain reflect generic representation of cereals necessary because cereal recipes used a refined flour ingredient plus a total dietary fiber ingredient code.
- **Multi-part ingredients** – 7 percentage levels (0%, 25%, 40%, 50%, 60%, 75%, or 100%) of whole grain reflect generic representation of foods ([Appendix 3, Table 19](#)).

Table 11. Examples of Grains by Component

Whole Grains		Refined Grains	
Brown rice (flour)	Oatmeal	Barley, pearled/flour	White rice (flour)
Buckwheat groats	Popcorn	Bran (of all grains)	Wheat flour, not 100%
Bulgar	Quinoa	Corn meal/flour	whole wheat
Corn meal, whole grain	100% whole wheat flour	Corn grits	Wheat germ
Millet	Wild rice	Couscous	
Oats		Cream of wheat/rice	

PROTEIN FOODS

Components

18. **Total Protein Foods**
19. Total Meat, Poultry, and Seafood
20. Meat *beef, veal, pork, lamb, goat, game*
21. Cured Meat* *frankfurters, sausages, corned beef, cured ham, luncheon meat made from beef, pork, poultry*
22. Organ Meat from *beef, veal, pork, lamb, game, poultry*
23. Poultry *chicken, turkey, other birds*
24. Seafood High in n-3 Fatty Acids *contains ≥ 500 mg EPA and DHA / 3 ounces cooked*
25. Seafood Low in n-3 Fatty Acids *contains < 500 mg EPA and DHA / 3 ounces cooked*
26. Eggs *chicken/other birds' eggs*
27. Soy Products *includes tofu, meat alternatives, soy in nutritional bars/powders; excludes soy milk and soy yogurt*
28. Nuts and Seeds *includes nut/seed butters*
29. **Beans, Peas, and Lentils (as protein food)**

*Cured meat categorized using U.S. Food and Drug Administration definitions for cured meat and poultry products (USHHS, FDA 2014).

Definition Examples - One Ounce Equivalent

- 1-ounce cooked lean meat, poultry, or seafood
- 1 egg
- $\frac{1}{4}$ cup cooked beans, peas, lentils, or tofu
- $\frac{1}{2}$ ounce nuts or seeds
- 1 tablespoon nut or seed butter

Additional Considerations

- **Canned tuna fish** – assigned as 30% high in *n*-3 fatty acids and 70% low in *n*-3 fatty acids as informed by market information
- **Soy in recipes** –some FNDDS recipes (e.g. ready-to-eat cereals, frozen meals) with soy flour or soy protein isolate solely to increase protein content to achieve a nutrient profile; in these cases, not considered for the Soy Products component
- Ounce Equivalents for Beans, Peas, and Lentils not included in Total Protein Foods component

Determination of Ounce Equivalent Weights

- Different types of servings for various protein foods (e.g., ounces of meat/seafood; number of eggs; tablespoons of nuts)
- Calculation of lean ounce equivalents of meat, poultry, and seafood affected by allowable fat amount (as detailed in the OILS AND SOLID FATS section)
- Adjustments for raw meat/poultry and seafood to equate food to a cooked, lean portion
- Definition examples of an ounce equivalent of protein foods in **Table 12** and examples of types of foods included in each protein foods component in **Table 13**

Table 12. Protein Foods – Examples of One Ounce Equivalent Weights

Protein Food	One Ounce Equivalent
Lean meat/poultry	28.35 g of cooked, lean portion containing ≤ 2.63 g of naturally present solid fats per ounce equivalent - For raw, lean portions, adjustments to equate food to cooked, lean portion
Lean seafood	28.35 g of cooked, lean portion containing ≤ 2.63 g of naturally present oils per ounce equivalent - For raw, lean portions, adjustments to equate food to cooked, lean portion
Eggs, raw or cooked	50 g
Soy tofu	$\frac{1}{4}$ cup or 250/4 g
Soy nuts, natto, cooked noodles	28.35 g
Soy flour, isolate, dry noodles	$\frac{1}{2}$ ounce or 28.35/2 g
Nuts/seeds, intact	$\frac{1}{2}$ ounce or 28.35/2 g
Nut/seed butters	1 tablespoon or 16 g
Beans, peas, lentils	$\frac{1}{4}$ cup or 44 g cooked; 15 g raw (If counted as Vegetables, 1 cup equivalent = 175 g cooked; 60 g raw)

Table 13. Examples of Protein Foods by Component

Meat			
Armadillo	Caribou	Moose	Squirrel
Bear	Goat	Opossum	Veal
Beaver	Ground hog	Pork	Venison
Beef	Ham (not cured)	Rabbit	Wild pig
Bison	Lamb	Raccoon	
Cured Meat			
Bacon (any meat/ poultry)	Frankfurters	Liverwurst/ Braunschweiger	Pork feet, pickled
Beef sausage	Ham (all cured)	Luncheon meat/ cold cuts (any meat/poultry)	Pork sausage
Blood sausage	Head cheese		Salami
Bologna	Hot dogs/frankfurters		Scrapple
Bratwurst	Italian sausage		Thuringer
Canned/potted meat	Jerky (any meat/poultry)	Luncheon meat, loaf	Turkey/chicken sausage
Chipped beef	Kielbasa	Mortadella	Turkey, smoked
Chorizo	Knockwurst	Pastrami	Venison sausage
Corned beef		Pepperoni	Vienna sausage
		Polish sausage	
Organ Meat			
Brain	Gizzard	Liver	Tongue
Chitterlings	Heart	Kidney	Tripe
Giblets	Hog maws/stomach	Sweetbreads/thymus	
Poultry			
Chicken	Duck	Ostrich	Quail
Cornish game hen	Goose	Pheasant	Turkey
Dove			
Seafood High in <i>n</i>-3 Fatty Acids			
Anchovy	Mackerel	Sardine	Swordfish
Caviar (Roe)	Pompano	Sea bass	Trout
Fish, pickled	Ray	Shark	Tuna, canned (30%)
Herring	Salmon		
Seafood Low in <i>n</i>-3 Fatty Acids			
Abalone	Fish, smoked	Mussels	Snail/escargot
Carp	Fish, white	Ocean perch	Snapper
Catfish	Flounder	Octopus	Sole
Clams	Frog legs	Oyster	Squid/calamari
Cod	Haddock	Perch	Tilapia
Crab	Halibut	Pike	Tuna, canned (70%)
Crayfish/crawfish	Imitation crab meat	Pollock	Tuna, yellowfin
Croaker	Lobster	Scallop	Turtle
Eel	Mullet	Shrimp	Whiting
Fish stick			

Table 13 (continued)

Eggs <i>(from all birds)</i>			
Egg, whole Egg white	Egg yolk	Egg, dried	Egg substitute
Soy Products			
Meat alternatives Natto Soy curd/tofu	Soy curd cheese Soy flour Soy noodles	Soy nuts Soy nut butter Soy protein isolate	Textured vegetable protein
Nuts and Seeds			
Almonds Almond butter Almond paste Brazil nuts Cashew Cashew butter	Chestnuts Chia seeds Flax seeds Hazelnuts Macadamia nuts Peanuts	Peanut butter Pecans Pine nuts Pistachios Pumpkin seeds	Sesame seeds Sunflower seeds Tahini (sesame butter) Walnuts
Beans, Peas, and Lentils as Protein Foods			
Black beans Blackeyed peas, from dried Chickpeas (Garbanzo beans) Edamame	Fava beans Kidney beans Lentils Lima beans, from dried Mung beans	Mung bean noodles Papad Peruvian (yellow) beans Pink beans	Pinto beans Refried beans Soybeans, mature Split peas White beans

DAIRY

Components

30. **Total Dairy**
31. Milk *includes soy milk*
32. Yogurt *includes soy yogurt*
33. Cheese

Definition Examples – One Cup Equivalent

- 1 cup of milk (includes soy milk)
- 1 cup of plain yogurt (includes soy yogurt)
- Amount of cheese containing ~ 300 mg calcium (*similar to 1 cup of milk*)

Additional Considerations

The following foods are **not** included in the Dairy Group

- **Whey** – not a separate FPED component
 - high variability in amounts of whey in different nutritional bars and powders and therefore difficult to estimate for generic FNDDS foods/beverages
- **Butter, creams, and cream cheese** (except fat-free cream cheese) – assigned to Solid Fats
- **Non-dairy milk alternatives other than soy milk** – component amounts determined based on ingredients

Determination of Cup Equivalent Weights

- **Milk or Yogurt** – cup equivalent of **fluid milk** (including unsweetened soy milk) and **plain yogurt** (including unsweetened soy yogurt) standardized to 245 g; adjustments for dry and evaporated milk
 - estimation based on amount of milk or yogurt in FNDDS recipe present for a systematic approach
- **Cheese** – cup equivalent amounts based on amount of cheese containing ~ 300 mg calcium (amount in 1 cup of fluid milk)
 - standardized cup weights for cheeses and cottage cheeses with similar calcium amounts
- Comprehensive list of equivalent weights for dairy in **Table 14**

Table 14. Dairy – Examples of One Cup Equivalent Weights (g or ounces)

Milk	
Buttermilk	245 g
Goat milk, fluid	
Milk, fluid	
Soy milk, unsweetened	25 g
Milk, dry	
Milk, evaporated	
Yogurt	
Yogurt, plain	245 g
Soy yogurt, unsweetened	

Table 14 (continued)

Cheese	
American American and Swiss blends Cheddar, nonfat Cheese with wine Gruyere Mexican blend, reduced fat Mozzarella, nonfat Parmesan Processed cheese food Swiss (all types)	1 ounce (28.35 g)
American, nonfat American, reduced sodium Anejo Brick Cheddar Cheddar, reduced fat Cheddar, reduced sodium Colby Colby Jack Cotija Gouda or Edam Mexican blend Monterey Monterey, reduced fat Mozzarella, NFS Mozzarella, part skim Mozzarella, reduced sodium Muenster Parmesan, fat free Parmesan, reduced fat Port du Salut Provolone Provolone, reduced fat	1.5 ounces
American, reduced fat American, restaurant Blue or Roquefort Cheese spread, American/cheddar cheese base Cheese spread, American/cheddar cheese base, reduced fat Cheese spread, pressurized can Cheese spread, Swiss cheese base Fontina Limburger	2 ounces

Table 14 (continued)

Muenster, reduced fat	
Oaxaca	
Paneer	2 ounces
Puerto Rican white cheese	
Queso fresco	
Camembert	
Cream cheese, fat free	3 ounces
Feta	
Goat cheese	3.5 ounces
Ricotta	4.5 ounces
Brie	6 ounces
Cottage cheese, low fat	10.5 ounces
Cottage cheese	12 ounces

OILS AND SOLID FATS

Components

- 34. Oils
- 35. Solid Fats

Definition Examples of Oils Gram Equivalents

- Nonhydrogenated vegetable oils (except palm and coconut)
- Fats naturally present in nuts/seeds, seafood, soy foods, and vegetables, **above allowable amount** defined in **Table 15**

Definition Examples of Solid Fats Gram Equivalents

- Fully/partially hydrogenated fats, shortenings, palm and coconut oils
- Fats naturally present in coconut, dairy, eggs, meat, and poultry **above allowable amount** defined in **Table 15**

Table 15. Foods – Oils and Solid Fats Above Allowable Fat

Food/Beverage	Allowable Fat*	Excess Fat (above Allowable Fat)
Avocado, olives	1.5 g/100 g	Oils
Potato chips	0 g	
Seafood	2.63 g/ lean ounce equivalent	
Soy products (<i>Protein Foods</i>)	2.63 g/ounce equivalent	
Soy milk/yogurt	1.5 g/cup equivalent	
Coconut	0 g	Solid Fats
Dairy	1.5 g/cup equivalent	
Eggs	2.63 g/ounce equivalent	
Meat/Poultry	2.63 g/ lean ounce equivalent	
French fries	0 g	Oils (85%) and Solid Fats (15%) Oils (100%) for school lunch fries
Nuts and seeds	2.63 g/ounce equivalent	Oils
Nut/seed butters	2.63 g/ounce equivalent	Oils (+ 1.5 g Solid Fats)
Other vegetables cooked in fat	Naturally present fat in vegetable	Oils and/or Solid Fats (based on recipe fat type)

*Basis for avocado, olives, dairy/soy milk/soy yogurt, vegetables cooked in fat in FPED 2017-2018 (Bowman S.A., et. al. 2020) and for Protein Foods in MPED2.0 (Bowman S.A., et. al. 2008).

Additional Considerations

- Margarines** and margarine spreads – 50% Oils/50% Solid Fats
- Nut/seed butters** – additional 1.5 g solid fats/100 g (added in processing)

Table 16 lists specific types of oils and solid fats in FPED.

Determination of Oils and Solid Fats Gram Equivalents

- One gram of oils/solid fats = one gram equivalent

Calculated from either:

- Foods **without** naturally present fats – Total fat derived from foods/beverages and recipe ingredients *defined as containing oils or solid fats*
- Foods **with** naturally present fats – Total fat **excluding allowable amount** in **Table 15**
- Assumptions from multi-part ingredient process (**Appendix 3**)

Table 16. Examples of Types of Oils and Solid Fats

Oils			
Fats naturally present in:	Oils of:		
Avocado	Almond	Flaxseed	Sunflower
Nuts/seeds	Canola	Margarine/spreads (50%)	Vegetable
Olives	Cooking spray	Peanut	Walnut
Seafood	Corn	Safflower	Wheat germ
Soy foods	Cottonseed	Soybean	
	Other Foods/Beverages defined as containing oils*		
	Imitation cheese	Salad dressings	
Solid Fats			
Fats naturally present in:	Other solid fats:		
Coconut	Butter	Hydrogenated oil	Palm oil
Dairy	Coconut oil	Lard	Shortening
Eggs	Ghee	Margarine/spreads (50%)	Tallow
Meat	Other Foods/Beverages defined as containing solid fats*		
Poultry	Candies	Cream	Cream, sour
	Chocolate beverage	Cream cheese,	Frosting
	mix/syrup	Regular/low-fat	Pre-lightened coffee
	Cocoa powder	Cream substitute	Pudding mix

*Percentages of oils and solid fats for foods/beverages included in the multi-part ingredients process are described in *Appendix 3*.

Example of Calculations of Ounce Equivalents of Lean Meat/Poultry or Seafood and Grams of Discretionary Solid Fats (*Meat/Poultry*) or Oils (*Seafood*)

Pork sausage, cooked (Total fat = 27.25%)

Allowable fat in 100 g meat = $(100 \text{ g} / 28.35 \text{ g per oz eq}) * 2.63 \text{ g} = 9.28 \text{ g}$

Total fat of 27.25 g (per 100 g cooked sausage) is greater than the allowable limit of 9.28 g so solid fats must be calculated.

Calculation of Ounce Equivalents of Lean Meat/100 g

Non-fat meat portion in 100 g sausage = $100 - 27.25 = 72.75 \text{ g}$

Number of ounce equivalents of lean meat = $72.75 / (28.35 - 2.63) = 2.83 \text{ lean oz eq}^*$

Calculation of Discretionary Solid Fats/100 g

Allowable fat in *calculated* oz eq of lean meat = $2.63 \times 2.83 = 7.44 \text{ g}$

Solid fat present above allowable limit = $27.25 - 7.44 = 19.81 \text{ g solid fat}^*$

*Final FPID/FPED amounts rounded to 1 decimal place for public release.

ADDED SUGARS

Component

36. Added Sugars

Definition

- Sugars added to foods as ingredient during preparation, processing, or at table
- Includes syrups, honey, and concentrated fruit/vegetable juices (in excess of expected amount from 100% fruit/vegetable juice or which contributes to fruit component) (USDA, FDA 2019)
- Does NOT include naturally present sugars in whole foods (e.g., fruit, milk)

Table 18 lists ingredients and types of foods/beverages assumed to contain added sugars.

Determination of Teaspoon Equivalents

Step 1: Calculate **grams** of added sugars.

- Foods **without** naturally present sugars – Total sugars derived from foods/beverages and recipe ingredients *defined as containing added sugars*
- Foods **with** naturally present sugars – Total sugars **excluding naturally present** sugars in **Table 17**
- Assumptions from multi-part ingredient process ([Appendix 3](#))

Table 17. Sugars - Calculation Assumptions for Naturally Present Sugars

Food	Naturally Present Sugar
Canned (w/syrup) fruit	Total sugars (g) in raw fruit
Fruit nectar (40% juice)	Total sugars (g) in raw fruit x 0.4
Fruit juice drinks (15% juice)	Total sugars of 2 g in juice
Nut butters	Total sugars (g) in raw/roasted nuts
Flavored milk	Total sugars of 5 g in plain milk
Soy milk	Total sugars of 0 g in unsweetened soy milk

Step 2: Calculate **teaspoon equivalents** using amount in 1 teaspoon granulated sugar (4.2 g).
 $\text{Added sugars (g)} / 4.2 = \text{teaspoon equivalents of added sugars}$

Additional Considerations for Products in Marketplace with Zero Added Sugars

- Some FNDDS foods/beverages with a positive value for total sugars for such products (includes **reduced sugar/no sugar added** nutritional beverages, hot chocolate, slush frozen drink, cookies, frozen fruit juice bar, whipped topping, diet sweet rolls)
- For FPED, zero added sugars for these products

Table 18. Examples of Types of Added Sugars

Ingredients	Foods/Beverages <i>Defined as Containing Added Sugars</i>
Brown sugar Confectioners' sugar Corn syrups and solids Dextrose Fructose Fruit juice concentrates (undiluted)* Granulated sugar Honey Molasses Powdered sugar Raw sugar Syrups (cane, fruit, maple, pancake, sorghum) White sugar (cane and beet)	Foods Breads, tortillas, muffins Candy, gum Canned fruits Coffee creamers Crackers, snacks Desserts (cakes, pies, cookies, ice cream, frozen yogurt, gelatin, pudding) Doughnuts Jams Nutritional/cereal bars Nut butters Pancakes, waffles, French toast Ready-to-eat cereals, flavored oatmeal Salad dressings, condiments Select mixed dishes Sweet sauces/toppings Beverages Beverage powders Energy drinks Flavored milks Flavored waters Fluid replacement drinks Fruit juice/flavored drinks Non-dairy milks Nutritional beverages Pre-sweetened coffee and tea Select alcoholic and non-alcoholic beverages Soft drinks

* Amount in excess of 100% fruit/vegetable juice

ALCOHOLIC DRINKS

Component

37. Alcoholic Drinks

Definition Examples – Number of Drinks

- 12 fluid ounces of beer
- 5 fluid ounces of wine
- 1.5 fluid ounces of 80-proof distilled spirit (straight or in a cocktail)

Determination of Number of Drinks

- One drink = alcoholic beverage containing 0.6 fluid ounce or 14 g of ethanol
- Number of alcoholic drinks = Alcohol (g) / 14

Literature Cited

- Bowman, S.A., Clemens, J.C., Friday, J.E., Lynch, K.L., & Moshfegh, A.J. (2017). Food Patterns Equivalents Database 2013-14: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Clemens, J.C., Friday, J.E., & Moshfegh, A.J. (2020). Food Patterns Equivalents Database 2017-2018: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Clemens, J.C., Friday, J.E., Thoeig, R.C., & Moshfegh, A.J. (2014a). Food Patterns Equivalents Database 2005-06: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Clemens, J.C., Friday, J.E., Thoeig, R.C., & Moshfegh, A.J. (2014b). Food Patterns Equivalents Database 2011-2012: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Clemens, J.C., Friday, J.E., Thoeig, R.C., Shimizu, M., Barrows, B.R., & Moshfegh, A.J. (2013a). Food Patterns Equivalents Database 2007-08: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Clemens, J.C., Shimizu, M., Friday, J.E., & Moshfegh, A.J. (2018). Food Patterns Equivalents Database 2015-2016: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Clemens, J.C., Thoeig, R.C., Friday, J.E., Shimizu, M., & Moshfegh, A.J. (2013b). Food Patterns Equivalents Database 2009-10: Methodology and User Guide. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.
- Bowman, S.A., Friday, J.E., & Moshfegh, A.J. (2008). MyPyramid Equivalents Database, 2.0 for USDA Survey Foods, 2003-2004. Food Surveys Research Group, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.

Bowman S.A., Martin C.L., Carlson J.L., Clemens J.C., Lin B.-H., and Moshfegh A.J. (2013c). Food Intakes Converted to Retail Commodities Databases: 2003-08: Methodology and User Guide. U.S. Department of Agriculture, Agricultural Research Service, Beltsville, MD, and U.S. Department of Agriculture, Economic Research Service, Washington, D.C. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.

Friday, J.E., & Bowman, S.A. (2006). MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002 Version 1.0. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.

USDA, Agricultural Research Service. (1975). Agriculture Handbook No. 102. Food Yields Summarized by Different Stages of Preparation. Retrieved from <https://www.ars.usda.gov/ARSTUserFiles/80400530/pdf/ah102.pdf>. Accessed March 17, 2026.

USDA, Agricultural Research Service. Food Surveys Research Group. (2021). AMPM - USDA Automated Multiple Pass Method. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.

USDA, Agricultural Research Service. Food Surveys Research Group. (2023). Food Patterns Equivalents Database 2017- 2018: Methodology and User Guide Amended for Use with WWEIA, NHANES 2017- March 2020 Prepandemic. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.

USDA, Agricultural Research Service. Food Surveys Research Group. (2024). USDA Food and Nutrient Database for Dietary Studies 2021-2023. Retrieved from www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 17, 2026.

USHHS Centers for Disease Control and Prevention, National Center for Health Statistics. (2024). National Health and Nutrition Examination Survey. Retrieved from <https://wwwn.cdc.gov/nchs/nhanes>. Accessed March 17, 2026.

USHHS Food and Drug Administration. (2026). Code of Federal Regulations. Part 145 Canned Fruits. Retrieved from <https://www.ecfr.gov/current/title-21/chapter-I/subchapter-B/part-145>. Accessed March 2, 2026.

USHHS Food and Drug Administration. (2019). Nutrition and Supplement Facts Labels: Questions and Answers Related to the Compliance Date, Added Sugars, and Declaration of Quantitative Amounts of Vitamins and Minerals: Guidance for Industry. Retrieved from <https://www.fda.gov/media/117402/download?attachment>. Accessed March 17, 2026.

USHHS Food and Drug Administration. (2014) FDA Food Code 2009: Annex 6- Food Processing Criteria. Smoking and Curing: (B) Definitions. Retrieved from <https://wayback.archive-it.org/7993/20170406184713/https://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm188201.htm#parta6-3> . Accessed March 17, 2026.

Appendix 1. FPED and MPED Versions, Corresponding WWEIA, NHANES Datasets, and Major Updates Between Versions

FPED/MPED ¹ Version	Major Updates Between Versions ²
Corresponding Datasets	
MPED 1.0	
CSFII 1994-1996, 1998, NHANES 1999-2000, WWEIA, NHANES 2001-2002	- Not applicable
MPED 2.0	
WWEIA, NHANES 2003-2004	- Solid fats, added sugars, and alcohol separated into main components (Formerly components grouped as Extras main component)
FPED 2005-2006	Renamed
WWEIA, NHANES 2005-2006	- Fish and Shellfish renamed to Seafood - Frankfurters, Sausage, Luncheon meats renamed to Cured Meat - Meat and Beans renamed to Protein Foods
	Reassigned
	- Fruit juices separated from intact or whole fruits and assigned to new Fruit Juice component (Formerly assigned to Fruits group)
	- Calcium fortified soy milk assigned to Dairy (Formerly assigned to Soybean Products)
	- Fats in stick, tub, and spread margarines divided into equal amounts of Oils and Solid Fats (Formerly stick margarines were assigned to Solid Fats; Tub and spread types containing <80% fat was assigned to Oils)
	- Red and Orange Vegetables component includes tomatoes and other red- and orange-colored vegetables (Formerly tomatoes excluded from Orange Vegetables component)
	Assignment Methodology Updates
	- Number of alcoholic drinks computed from ethanol content (1 drink = amount of alcoholic beverage containing 0.6 fl oz (14 g) ethanol)
	- Consolidation of weights for similar fruits and for similar vegetables to same cup weights
	- For grain products made of flour, 16 g flour = 1 oz equivalent of grains
	- Cooked grains (i.e., cooked rice, pasta, and hot breakfast cereals) converted to uncooked form, and 1 oz equivalent of grains = 28.35 g
	- Added sugar equivalents calculated using the total sugar content of foods and ingredients defined as added sugar (Formerly computed from gram weights of sugar ingredients)
	- Allowable fat in the Dairy component increased from 0.2 g fat/1 cup equivalent of dairy to 1.5 g fat/1 cup equivalent of dairy
FPED 2007-2008	
WWEIA, NHANES 2007-2008	- No major update
FPED 2009-2010	
WWEIA, NHANES 2009-2010	- No major update
FPED 2011-2012	
WWEIA, NHANES 2011-2012	- Undiluted fruit juice concentrates added as ingredients assigned to Added Sugars (Formerly assigned to Fruit Juice)
FPED 2013-2014	
WWEIA, NHANES 2013-2014	- No major update
FPED 2015-2016	
WWEIA, NHANES 2015-2016	- No major update

FPED/MPED¹ Version	
<i>Corresponding Datasets</i>	Major Updates Between Versions²
FPED 2017-2018 <i>WWEIA, NHANES 2017-2018</i>	- No major update
FPED for Use with WWEIA, NHANES 2017-March 2020 Prepandemic <i>WWEIA, NHANES 2017-March 2020 Prepandemic</i>	- All component data based on FPED 2017-2018
FPED 2021-2023 <i>WWEIA, NHANES August 2021-August 2023</i>	- Incorporates updates from FNDDS 2019-2020 and FNDDS 2021-2023 - Whey assumption (not published) removed from Total Dairy calculation - Majority of FPED component calculations based on applying FPID amounts proportionally using recipe of ingredients; minor adjustments as needed - Standardized generic characterization of 568 multi-part ingredients - All FPID and FPED amounts rounded to one decimal place rather than two decimal places

¹ MyPyramids Equivalents Database (MPED) is the prior food components equivalents database.

² Bowman S.A., et. al. 2008; Bowman S.A., et al., 2013a; Bowman S.A., et al., 2013b; Bowman S.A., et. al., 2014a; Bowman S.A., et. al. 2014b; Bowman S.A., et. al. 2017; Bowman S.A., et. al. 2018; Bowman S.A., et. al. 2020; Friday J.E., et. al. 2006; USDA, ARS, FSRG 2023.

Appendix 2. Connecting MPED 2.0 and FPED Variables

MPED ¹ 2.0 Variables	FPED Variables	Foods in FPED Variables (units)
F_TOTAL	F_TOTAL	Total intact fruits and fruit juices (cup eq.)
F_CITMLB ²	F_CITMLB	Intact fruits of citrus, melons, and berries (cup eq.)
F_OTHER ²	F_OTHER	Intact fruits excluding citrus, melons, and berries (cup eq.)
--	F_JUICE ²	Fruit juices, citrus and non-citrus (cup eq.)
V_TOTAL	V_TOTAL	Total dark green, red and orange, starchy, and other vegetables; excluding beans, peas, and lentils (cup eq.)
V_DRKGR	V_DRKGR	Dark green vegetables (cup eq.)
--	V_REDOR_TOTAL ³	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
V_TOMATO	V_REDOR_TOMATO	Tomatoes and tomato products (cup eq.)
V_ORANGE	V_REDOR_OTHER	Other red and orange vegetables; excluding tomatoes and tomato products (cup eq.)
--	V_STARCHY_TOTAL ³	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
V_POTATO	V_STARCHY_POTATO	White potatoes (cup eq.)
V_STARCHY	V_STARCHY_OTHER	Other starchy vegetables; excluding white potatoes (cup eq.)
V_OTHER	V_OTHER	Other vegetables not in specific vegetable components (cup eq.)
LEGUMES	V_LEGUMES	Beans, peas, and lentils as vegetables (cup eq.)
G_TOTAL	G_TOTAL	Total whole and refined grains (oz. eq.)
G_WHL	G_WHOLE	Whole grains (oz. eq.)
G_NWHL	G_REFINED	Refined grains (oz. eq.)
--	PF_TOTAL ³	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy products, and nuts and seeds; excluding beans, peas, and lentils (oz. eq.)
M_MPF	PF_MPS_TOTAL	Total meat, poultry, organ meat, cured meat, and seafood (oz. eq.)
M_MEAT ⁴	PF_MEAT	Beef, veal, pork, lamb, goat, game meat (oz. eq.)
M_FRANK ⁴	PF_CUREDMEAT	Frankfurters, sausages, corned beef, cured ham, luncheon meat made from beef, pork, poultry (oz. eq.)
M_ORGAN	PF_ORGAN	Organ meat from beef, veal, pork, lamb, game, poultry (oz. eq.)
M_POULT	PF_POULT	Chicken, turkey, other birds (oz. eq.)
M_FISH_HI	PF_SEAFD_HI	Seafood high in n-3 fatty acids, contains ≥ 500 mg EPA and DHA / 3 ounces cooked (oz. eq.)
M_FISH_LO	PF_SEAFD_LOW	Seafood low in n-3 fatty acids, contains < 500 mg EPA and DHA / 3 ounces cooked (oz. eq.)
M_EGG	PF_EGGS	Eggs (chicken, other birds) and egg substitutes (oz. eq.)

MPED¹ 2.0 Variables	FPED Variables	Foods in FPED Variables (units)
M_SOY ⁵	PF_SOY	Soy products including tofu, meat alternatives, soy in bars/powders; excluding soy milk and soy yogurt (oz. eq.)
M_NUTSD	PF_NUTSDS	Peanuts, tree nuts, and seeds, including nut/seed butters; excluding coconut (oz. eq.)
--	PF_LEGUMES ³	Beans, peas, and lentils as protein foods (oz. eq.)
D_TOTAL	D_TOTAL	Total milk, yogurt, and cheese (cup eq.)
D_MILK ⁵	D_MILK	Fluid milk, buttermilk, evaporated milk, dry milk, including soy milk (cup eq.)
D_YOGURT	D_YOGURT	Yogurt, including soy yogurt (cup eq.)
D_CHEESE	D_CHEESE	Cheese (cup eq.)
DISCFAT_OIL	OILS	Fats naturally present in seafood, nuts, seeds, soy, avocado, and olives above allowable amounts. Nonhydrogenated vegetable oils (except palm and coconut) and 50% of fat in margarines/margarine spreads (grams)
DISCFAT_SOL	SOLID_FATS	Fats naturally present in meat, poultry, eggs, dairy, and coconut above allowable amounts. Fully/partially hydrogenated fats and shortenings, palm and coconut oils and 50% of fat in margarines/margarine spreads (grams)
ADD_SUG	ADD_SUGARS	Foods defined as added sugars (tsp. eq.)
A_BEV	A_DRINKS	Alcoholic beverages (no. of drinks)

¹MyPyramids Equivalents Database (MPED) is the prior food components equivalents database.

²Fruit juices were included in the individual fruit subgroups in MPED 2.0. In FPED, they are in the Fruit Juice group (F_JUICE).

³FPED contains new variables which were not in MPED 2.0.

⁴Cured/smoked meat were included in the M_MEAT subgroup in MPED 2.0. In FPED, it is a separate group (PF_CUREDMEAT).

⁵Calcium fortified soy milk was included in the M_SOY subgroup in MPED 2.0 and is placed in the Dairy group in FPED.

Appendix 3. Methods to Determine FPID Amounts for Multi-part Ingredients in FPID 2021-2023

Overall Approach

1. Reviewed FPID 2017-18 profiles for 568 SR codes representing **multi-part ingredients** comprised of more than one basic food ingredient and containing multiple components (using subject matter experts).
2. Adjusted amounts of select components including standardizing amounts across similar ingredients as informed by a variety of sources: similar FNDDS foods/beverages, food label data and product information, cookbooks and recipe websites.

Identification of Multi-part Ingredients

- Last variable in FPID 2021-2023 per 100 g files of “Multi_part_ingredient”; foods identified with a value of “yes”

Methods for Specific Components Across Food Groups

Whole Grain Component in Ready-to-Eat (RTE) Grain-based Products

- Seven percentage levels (0%, 25%, 40%, 50%, 60%, 75%, or 100%) of whole grain in **Table 19** reflecting generic representation of groups of foods informed by label and product information
- Whole wheat ingredients generally 100% whole grain
- Wheat or multigrain ingredients generally 25% whole grain

Table 19. Examples of Multi-part Ingredients – Whole Grains as Percentage of Total Grains

Whole Grain %	Types of Foods
100	Whole wheat breads, rolls, tortillas, and crackers; oats; granola and high fiber bars; popcorn; other whole grain snacks
75	Multigrain oatmeal; multigrain baby cereal
60	Nutritional bars
50	School lunch breaded chicken and pizzas; whole wheat waffles/pancakes; baby snacks; cereal bars; graham crackers; Indian breads
40	Gluten-free breads
25	Wheat/multigrain breads, bagels, and crackers; oatmeal cookies
0	White/other breads, bagels, rolls, tortillas, and crackers; waffles/pancakes; snacks; cakes; cookies; pastries; doughnuts; pizzas; miscellaneous foods

Added Sugars

- Wide variation in added sugars for foods/beverages represented generically
- FPID 2017-2018 amounts for added sugars rounded to nearest 0.5 teaspoon equivalent for FPID 2021-2023

Oils / Solid Fats

- Wide variation in total fat and percentage of oils/solid fats for foods/beverages represented generically
- FPID 2017-2018 amounts for oils and solid fats summed and rounded to the nearest gram and generic percentages of oils/solid fats (0%, 25%, 50%, 75%, or 100%) applied to food groups for FPID 2021-2023 as shown in **Table 20**

Table 20. Examples of Multi-part Ingredients – Percentages of Oils and Solid Fats

Food Group	% Oils	% Solid Fats
Salad dressing	100	0
Condiments/Sauces	100 (oil-based)	0 (dairy-based)
Candy, chocolate	0	100
Candy, chocolate with nuts	25	75
Ice cream	0	100
Ice cream with nuts	25	75
Cookies	50	50
Cookies with nuts	75	25
Sweet baked foods	50	50
Cereal and granola bars	50	50
Cereal and granola bars (with nuts)	75	25
Jam and dessert toppings	100 (nut/fruit-based)	100 (dairy-based)
Breads	100	0
Tortillas, flour	50	50
Croissants	0	100
Crackers	75	25
Other snacks (chips, pretzels)	100	0
Pizza	50	50
Breaded/Fried chicken	100 (breast) 50 (parts)	0 (breast) 50 (parts)
Nutritional beverages and bars	50	50
Beverages	100 (plant-based)	100 (dairy-based)
Fast foods (meat based)	25	75
Fast foods (fish or vegetable-based)	75	25
Mexican foods (mixed dish)	0	100
Mexican foods (rice, bean dip)	100	0
Mexican foods (refried beans)	50	50
Asian foods (vegetable-based)	100	0
Asian foods (meat-based)	75	25
Pasta and rice	0	100
Plant-based alternatives	100	0
Condensed soup and gravy	0	100
Unique ingredients	*	*

*Ingredients that did not fall into other groups. Decisions for percentage of oil/solid fat in other groups informed unique ingredient assignments (e.g., meat-based ingredient assigned 100% solid fat).