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TOXICOLOGY REGULATORY SERVICES
A SafeBridge Consultants Company

May 14, 2019

via UPS

#874

Paulette M. Gaynor, Ph.D.
Senior Regulatory Health Project Manager
Division of Biotechnology and GRAS Notice Review
Office of Food Additive Safety (HFS-200)
Center for Food Safety and Applied Nutrition
Food and Drug Administration
5001 Campus Drive
College Park, MD 20740

Re: GRAS Notification for Corn Protein

Dear Dr. Gaynor,

In accordance with 21 CFR §170, Subpart E - Generally Recognized as Safe (GRAS) Notice, I am submitting, as the agent of the Notifier, Cargill, Incorporated, 15407 McGinty Road West/MS-163, Wayzata, MN 55391, a Notification regarding the conclusion of GRAS status for the use of corn protein as a source of protein in a variety of food categories, and for such functional effects as thickening, water absorption, fat/oil absorption, gelation, and solid fat emulsification.

Enclosed is one printed copy of the Notification as well as an electronic copy of the Notification on CD.

Please contact me with any questions.

Best regards,

Andrey I. Nikiforov, Ph.D.
Principal and Scientific Director

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Enclosures

Safety Evaluation Dossier Supporting a Generally Recognized As Safe (GRAS) Conclusion for Corn Protein

SUBMITTED BY:

Cargill, Incorporated
15407 McGinty Road West/MS-163
Wayzata, MN 55391

SUBMITTED TO:

U.S. Food and Drug Administration
Center for Food Safety and Applied Nutrition
Office of Food Additive Safety (HFS-200)
5001 Campus Drive
College Park, MD 20740

CONTACT FOR TECHNICAL OR OTHER INFORMATION:

Andrey I. Nikiforov, Ph.D.
Toxicology Regulatory Services (TRS)
154 Hansen Road, Suite 201
Charlottesville, VA 22911

May 14, 2019

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§ 170.225 Part 1, GRAS Notice: Signed Statements and Certification

GRAS Notice Submission

The current GRAS Notice is hereby submitted in accordance with Title 21 of the U.S. Code of Federal Regulations (CFR), Chapter I, Subchapter B, Part 170, Subpart E to inform the Agency that the proposed uses of corn protein described herein have been determined to be generally recognized as safe (GRAS) through scientific procedures, and are therefore exempt from the pre-market approval requirements of the Federal Food, Drug, and Cosmetic Act.

14 May 2019
Date

Andrey I. Nikiforov, Ph.D.
Principal and Scientific Director
Toxicology Regulatory Services, Inc.
Agent for Cargill

Name and Address of Notifier

Cargill, Incorporated
15407 McGinty Road
Wayzata, MN 55391

Name of Notified Substance

The name of the substance that is the subject of this GRAS conclusion is corn protein.

Intended Use in Food

Corn protein is intended for use as a source of protein in a variety of food categories. It is also intended for such functional effects as thickening, water absorption, fat/oil absorption, gelation, and solid fat emulsification.

Basis for GRAS Conclusion

The basis for the GRAS conclusion for corn protein is through scientific procedures in accordance with 21 CFR §170.30(a) and (b). These criteria are applied herein in an analysis of whether the use of corn protein is GRAS for the intended conditions of use, i.e. as a source of protein, and for functional uses such as thickening, water absorption, fat/oil absorption, and gelation in a variety of food categories, and solid fat emulsification.

The members of an Expert Panel (the Panel) were convened to evaluate corn protein and its general recognition of safety. The Panel's Opinion is provided as Exhibit I of this Notice. The Panel critically evaluated the information summarized herein and other information they deemed appropriate and relevant. The Panel unanimously concluded that the totality of the evidence satisfies the safety standard of reasonable certainty of no harm for the intended conditions of uses of corn protein. In addition, because the information supporting safety is widely known and accepted by qualified experts, the Panel concluded that corn protein is not only safe, but generally recognized as safe (GRAS) for the intended condition of use described herein.

Based upon our findings and knowledge of the information compiled in this Notice, supported by the Expert Panel, we conclude that corn protein is GRAS for the intended conditions of use described herein.

To the best of our knowledge, the current GRAS Notice is a complete, representative, and balanced submission that includes unfavorable information, as well as favorable information, known to us and pertinent to the evaluation of the safety and GRAS status of the use of corn protein.

Availability of Information

The data and information that serve as the basis for this GRAS conclusion, as well any information that has become available since the GRAS conclusion, will be sent to the FDA on request, or are available for the FDA's review and copying during customary business hours from Toxicology Regulatory Services Inc., 154 Hansen Road, Suite 201, Charlottesville, VA 22911 [contact: Andrey Nikiforov (Agent for Cargill), telephone (434) 977-5957; email: anikiforov@toxregserv.com].

None of the data and information in Parts 2 through 7 of the current GRAS Notice are considered to be exempt from disclosure under the Freedom of Information Act (FOIA), 5 U.S.C. 552.

§ 170.230 Part 2, Identity, Method of Manufacture, Specifications, and Physical or Technical Effect

Characterization

The subject of this GRAS Notification is corn protein that is composed of at least 65% protein; the remainder being carbohydrates, fat/oil, ash, organic acid, and water. It typically appears as a pale yellow to light tan powder.

Corn Protein Method of Manufacture

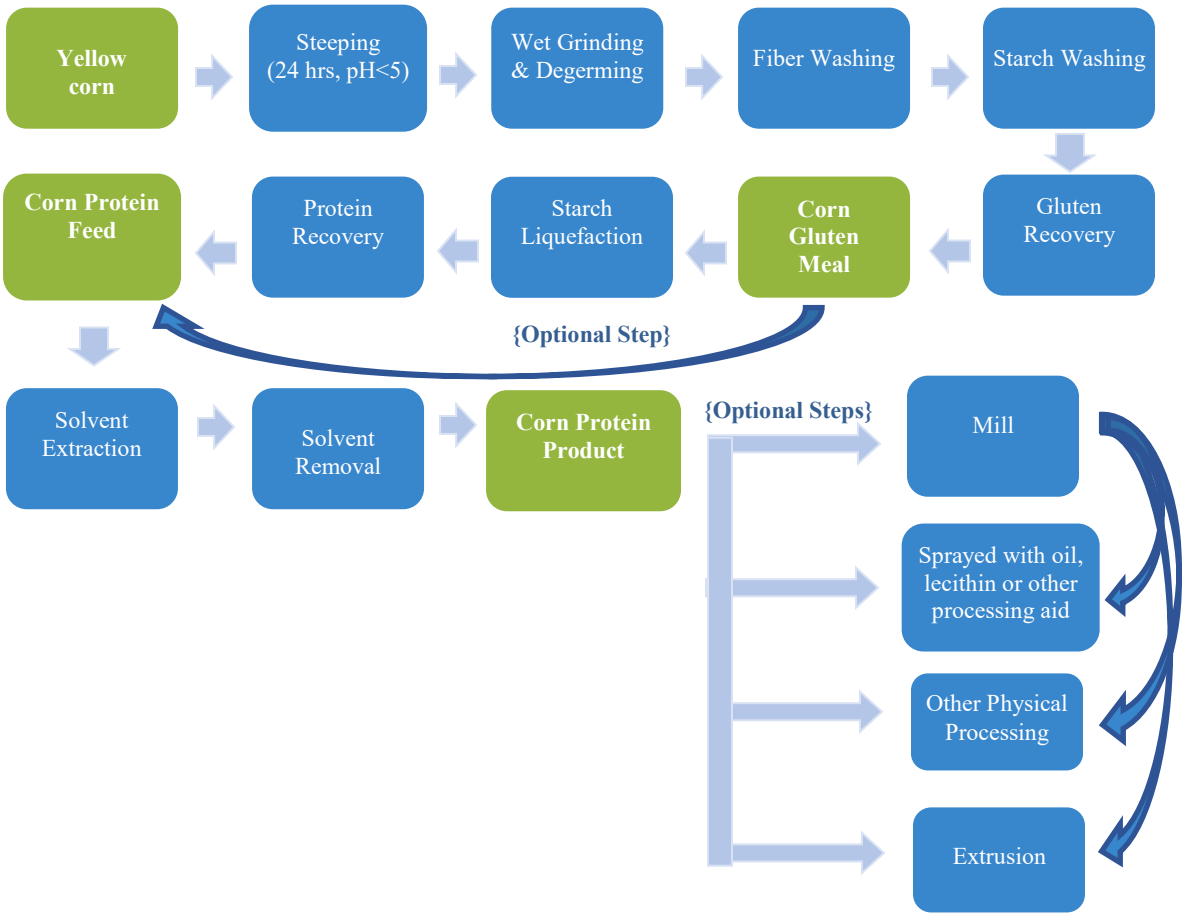
Cargill's corn protein is manufactured from corn gluten meal in accordance with current good manufacturing practices (cGMP) for food (21 CFR Part 110). All raw materials and processing aids used in the manufacture of corn protein are considered safe and appropriate for use in foods. Figure 1 provides a flow diagram of the manufacturing process.

Corn gluten meal, which is obtained through wet-milling of maize, is pH adjusted using food grade buffers, processed by jet cooking the slurry, injection of heat-resistant food grade enzyme, such as alpha-amylase[1], followed by incubation at approximately 75-85°C until the solubilized starch can be removed from the insoluble protein. During the wet-milling of maize, antimicrobial preservation is completed by liberated sulfur dioxide (SO2), derived from sodium bisulfite (food grade), ammonium bisulfite (food grade) or a sulfur burner. The insoluble protein may be pH adjusted using food grade buffers and processing aid, and then recovered on a filter with a rinse of fresh water and up to 2% oxidizing agent to yield the wet destarched corn protein. Alternatively, corn gluten slurry is collected directly on a filter without destarching in a similar process.

[1] The alpha-amylase used as a processing aid in corn protein production is sourced from a nonpathogenic and nontoxigenic strain of *Bacillus licheniformis*, and meets FCC (2016) and JECFA (FAO, 2016) specifications for food enzymes.

Destarched corn protein or corn gluten, as a wet cake containing about 40-55% solids, is then fed into a dryer to raise the dry solids content as needed and subsequently deposited in an immersion extractor. Solids are washed in a counter-current fashion with food grade ethyl alcohol or specially denatured ethyl alcohol (SDA 35A) through multiple immersions. Residual solvent levels (including the ethyl acetate denaturant present in SDA 35A) are limited according to the Specifications listed in Table 1. An oxidizing agent determined to be safe and suitable for use in food ingredient production is added at no more than 2% to diminish the levels of sulfur dioxide to below 100 ppm. After a final drainage, the solids are dropped into a desolventizer which removes the solvent to levels in Table 1. The resulting powder, which consists of at least 88% solids, may be milled, physically processed or sprayed with food grade oil, lecithin or other safe and suitable processing aid prior to bulk packaging.

Figure 1. Corn Protein Process Flow Diagram



Solvent Removal

Specifications for Food Grade Corn Protein

The food grade specifications for corn protein are summarized in Table 1. Conformance to specifications and consistency in the manufacturing process of corn protein is demonstrated by the analyses of multiple non-consecutive batches of commercially representative corn protein (Table 2).

In addition, appropriate food safety and quality controls are in place to ensure that potential contaminants (*e.g.*, mycotoxins and pesticides) are absent from the product or below levels of safety concern (Table 3) (see additional discussion of potential contaminants and impurities in § 170.250 Part 6, GRAS Narrative).

Table 1. Food Grade Specifications for Corn Protein

Item	Corn Protein Specifications (acceptable range)	Method
Loss on drying (%)	≤ 12	Mettler Toledo Moisture analyzer
Protein (% dry basis)	minimum 65	Leco, combustion
Ethyl alcohol (g/kg)	< 60	Waters HPLC using size exclusion Aminex HPX-87H column, along with an RI detector
Ethyl acetate (mg/kg)	< 1,000	Static headspace GC analysis with FID detection
SO_2 (mg/kg)	< 100	Monier-Williams distillation method using an auto pH titrator
Aerobic Plate Count (cfu/g)	< 10,000	AOAC 990.12
Enterobacteriaceae (cfu/g)	< 10	AOAC 2003.01
Salmonella (cfu/25g)	Negative	AOAC 2004.03 (negative per 25 g)
Yeast & Mold (cfu/g)	< 5,000	FDA-BAM 7th Ed.
Heavy Metals		
Heavy Metals as Lead (ppm)*	< 20	USP/NF 231
Lead (ppm)	< 1	J. AOAC vol 90 (2007) 844-856
Mercury (ppm)	< 1	J. AOAC vol 90 (2007) 844-856

*Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.
AOAC = Association of Official Analytical Chemists

Table 2. Analytical Results for Multiple Non-Consecutive Batches of Corn Protein

Parameter	**Specifications**						
Loss on drying (%)	≤ 12	1.7	6.0	1.0	1.6	0.9	1.7
Protein (% dry basis)	≥ 65	87.9	87.9	87.9	88.1	87.9	87.9
Ethyl alcohol (g/kg)	< 60	11.7	52.8	7.6	12.6	6.0	12.8
Ethyl acetate (mg/kg)*	< 1,000	67.37	103.3	49.3	66.4	60.3	95.3
Sulfur dioxide (mg/kg)	< 100	42	40	41	42	45	32
Aerobic plate count (cfu/g)	< 10,000	< 10	190	7300	< 10	20	< 10
Enterobacteriaceae (cfu/g)	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Salmonella (cfu/25g)	negative	Negative	negative	negative	negative	negative	negative
Yeast (cfu/g)	< 5000	< 10	< 10	< 10	< 10	< 10	< 10
Mold (cfu/g)	< 5000	< 10	< 10	10	< 10	< 10	< 10
Heavy Metals							
Heavy metals as Pb (ppm)	< 20	< 10	< 10	< 10	< 10	< 10	< 10
Lead (ppm)	< 1	0.030	0.019	0.024	0.022	0.017	0.017
Mercury (ppm)	< 1	< 0.010	<0.010	<0.010	< 0.010	<0.010	<0.010

*Specification for ethyl acetate applicable only to corn protein produced with SDA 35A

Table 3. Mycotoxins Analysis and Pesticide Screening Results for Corn Protein

Parameter	Regulatory Limit Values	Corn Protein Acceptance Criteria*	Method	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mycotoxins									
Aflatoxins (B1, B2, G1, G2) (ppb)	FDA Action Level: 20 ppb [a] EU MCLs: 5-10 ppb [b]	≤ 5 ppb (LOD 1 ppb)	AOAC 994.08 with modifications	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Fumonisins (B1, B2, B3) (ppm)	FDA Guidance Levels: 2-4 ppm [c] CODEX MLs: 2-4 ppm [d] EU MCLs: 0.2-1.0 ppm [e]	≤ 1.5 ppm (LOD 0.1 ppm)	AOAC 2001.04 with modifications	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Zearalenone (ppb)	FDA Guidance Level: none available EU MCLs: 20-200 ppb [f]	≤ 200 ppb (LOD 50 ppb)	JAOAC 88(6) 2005 with modifications	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pesticides**	Varied**	n.d. (LOQ ≤ 0.05 ppm)**	AOAC 2007.01	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

* Acceptance Criteria for mycotoxins in corn protein product are based on available US FDA and/or EU Maximum Contaminant Levels (MCLs), Maximum Levels (MLs), Guidance Levels, or Action Levels for mycotoxins in foods and ingredients as well as consumer exposure thresholds determined for safety assessment. See additional discussion below in § 170.250 Part 6 (GRAS Narrative).

** See Appendix 2 for listing of analytes (n=488) included in the screening analysis. Limit of quantification varies depending on the pesticide.

n.d. = Non Detected; LOD = Limit of Detection; LOQ = Limit of Quantification

[a] Action Level for foods adulterated with aflatoxin (FDA, 2005).

[b] MCLs for maize to be subjected to sorting or other physical treatment before human consumption or use as an ingredient in foodstuffs [5 ppb for Aflatoxin B1; 10 ppb for Total Aflatoxins B1, B2, G1, G2] (EC, 2006).

[c] Guidance Levels for whole, degermed, or partially degermed dry milled corn products for human consumption (FDA, 2001).

[d] MLs for raw maize grain (4 ppm); maize flour and maize meal (2 ppm) (CAC, 2016).

[e] MCLs for maize flour, maize meal, maize grits, maize germ and refined maize oil (1.0 ppm); maize based foods for direct human consumption (0.4 ppm); processed maize-based foods and baby foods for infants and young children (0.2 ppm) (EC, 2006).

[f] MCLs for maize intended for direct human consumption, maize flour, maize meal, maize grits, maize germ and refined maize oil (200 ppb); maize snacks and maize based breakfast cereals (50 ppb); processed maize-based foods for infants and young children (20 ppb) (EC, 2006).

Composition of Food Grade Corn Protein

The typical composition and detailed nutritional analysis data for corn protein are presented below in Tables 4 and 5. The nutritional profile of raw corn is also included in Table 5 for reference. The amino acid profile for corn protein raw material is presented in Figure 2. The amino acid profile is not expected to be significantly different in the finished corn protein given that preservation of protein content is a primary objective of the manufacturing process. Corn protein contains a high level of leucine, which is a critical amino acid for muscle protein synthesis (Pasiakos *et al*., 2011; Casperson *et al*., 2012; Dillon, 2013), and glutamine, which is essential under conditions of stress (Roth, 2008; Stehle and Kuhn, 2015). As shown in Figure 3, the amino acid profile of corn protein is qualitatively similar to other commonly consumed plant-derived proteins, with lower amounts of lysine noted but much higher levels of leucine.

Table 4. **Compositional Data for Three Non-Consecutive Lots of Corn Protein**

Material ID	[redacted]	[redacted]	[redacted]
Loss on drying % (as is)	**3.6**	**3.5**	**3.5**
Protein			
% (dry basis)	88.0	87.9	88.2
% (as is)	**84.8**	**84.8**	**85.1**
Fat/Oil			
% (dry basis)	0.99	1.01	1.00
% (as is)	**0.96**	**0.98**	**0.97**
Total Soluble Carbohydrates			
% (dry basis)	*2.47*	*2.56*	*1.91*
% (as is)	***2.38***	***2.47***	***1.85***
Total Organic Acids			
% (dry basis)	*0.34*	*0.30*	*0.22*
% (as is)	***0.33***	***0.29***	***0.22***
Total Measured % (as is) §	92.1	92.0	91.6

As is – Wet Basis (i.e. not adjusted for moisture content); Dry Basis – adjusted for moisture content

Bolded values are included in Total Measured % (as is).

§ Remaining content consists primarily of insoluble carbohydrates (i.e. long-chain dextrins) in addition to fiber, ash, and inositol (as phytate).

Table 5. Nutritional Profiles of Corn Protein and Raw Corn

Analyte	Method	Corn Protein Data							Raw Corn Data	
		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Yellow Corn (USDA, 2016a)	White Corn (USDA, 2016b)
Calories (kcal/100 g)	Atwater	377	381	374	378	386	388	357	86	86
Calories from total fat (kcal/100 g)	CFR 21-calc	4	4	3	6	8	12	3	NR	NR
Total fat as triglycerides (g/100 g)	AOAC 996.06 (modified)	0.4	0.4	0.4	0.6	0.8	1.3	0.36	1.4	1.2
Saturated fat (g/100 g)	AOAC 996.06 (modified)	0.2	0.2	0.1	0.2	0.2	0.3	0.06	0.3	0.2
Trans fatty acids (g/100 g)	AOAC 996.06 (modified)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.00	0.00
Cholesterol (mg/100 g)	AOAC 994.01	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<1.0	0	0
Sodium (mg/100 g)	AOAC 965.17/985.01 (modified)	26	28	23	157	161	156	263	15	15
Carbohydrates (%)	CFR 21-calc	28.0	27.7	23.4	8.0	9.0	8.9	4.1[b]	19	19
Dietary fiber (g/100 g)	AOAC 991.43	3.6	1.9	3.9	6.5	2.8	3.5	6.7	2.0	2.7
Total sugars (g/100 g)	AOAC 982.14	<0.35	<0.35	<0.35	<0.35	0.37	<0.35	0.44	6.26	3.22
Protein (%)	AOAC 990.03, AOAC 992.15	65.3	66.5	69.4	85.1	85.5	85.0	84.4	3.27	3.22

AOAC = Association of Official Analytical Chemists; NR = Not reported.

[a] Recent batch analysis conducted for comparison to previous datasets; methods may vary from those identified in Table (see Appendix I-B).

[b] Calculated value.

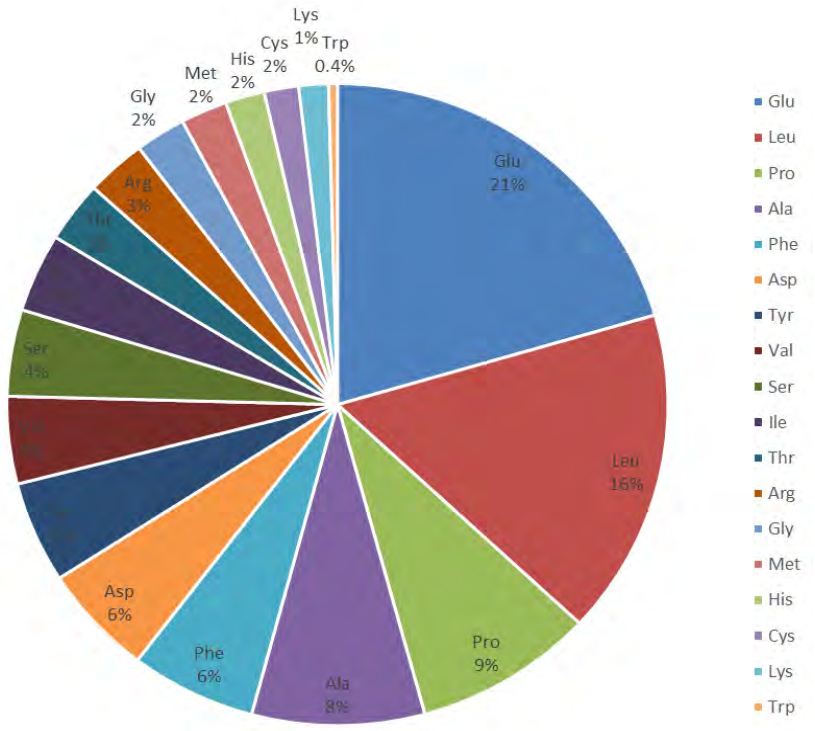
Table 5. Nutritional Profiles of Corn Protein and Raw Corn (*continued*)

Analyte	Method	Corn Protein Data							Raw Corn Data	
		[redacted]							Yellow Corn (USDA, 2016a)	White Corn (USDA, 2016b)
Vitamin D (µg/100 g)	Huang *et al.*, 2014	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	0	0
Calcium (mg/100 g)	AOAC 965.17/985.01 (modified)	7.7	6.3	4.5	7.1	6.8	4.6	1090	2	2
Iron (mg/100 g)	AOAC 965.17/985.01 (modified)	8.6	8.6	6.0	24.2	20.9	13.8	18.9	0.52	0.52
Potassium (mg/100 g)	AOAC 965.17/985.01 (modified)	126	127	100	120	125	111	153	270	270
Moisture (%)	AOAC 925.09	4.8	3.9	5.4	5.1	3.2	3.5	6.4	76	76
Ash (%)	AOAC 942.05	1.5	1.5	1.5	1.2	1.4	1.2	4.7	NR	NR

AOAC = Association of Official Analytical Chemists; NR = Not reported.

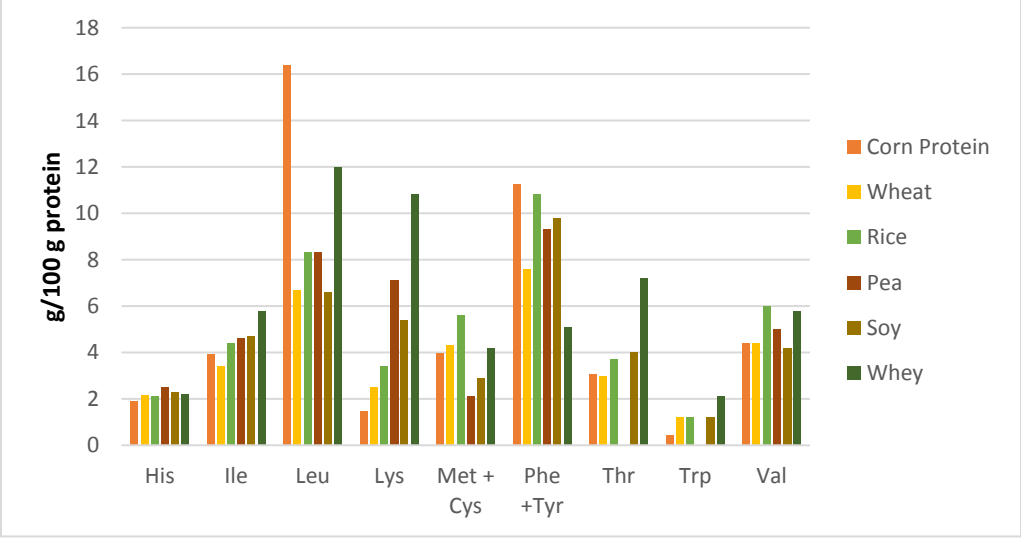
[a] Recent batch analysis conducted for comparison to previous datasets; methods may vary from those identified in Table (see Appendix I-B).

Figure 2. Amino Acid Profile for Corn Protein Raw Material



Glutamic Acid (Glu); Leucine (Leu); Proline (Pro); Alanine (Ala); Phenylalanine (Phe); Aspartic Acid (Asp); Tyrosine (Tyr); Valine (Val); Serine (Ser); Isoleucine (Ile); Threonine (Thr); Arginine (Arg); Glycine (Gly); Methionine (Met); Histidine (His); Cysteine (Cys); Lysine (Lys); Tryptophan (Trp)

Figure 3. Comparison of Amino Acid Profile for Corn Protein Raw Material to Common Food Proteins*



* Source for data other than corn protein: GRN 575 (Oat Protein), p. 000019.

Physical or Technical Effect

Corn protein is proposed for use as a source of protein and for functional uses such as thickening, water absorption, fat/oil absorption, gelation and solid fat emulsification in a variety of food categories. These proposed uses are consistent with those previously recognized in GRNs for other plant-based protein sources such as soy (GRN No. 134, p.000010), canola (GRN No. 386, p. 000008; GRN No. 693, p. 7), pea (GRN No. 581, p.16; GRN No. 608, p. 000013; GRN No. 788, Agency Response Letter [FDA, 2018]), wheat (GRN No. 26; p. 000018), rice (GRN No. 609, pp. 000080-000081), oat (GRN No. 575, p. 000014), potato (GRN No. 447, p. 5), mung bean (GRN No. 684, p.5). Corn protein is proposed for use in bakery products, cooked pasta (from fresh or dry), ready-to-eat (RTE) cereals, meat analogs & vegetarian products, processed meats, snack foods, nutrition bars, mixed dishes with sauce, nut butters (excluding full-fat peanut butter), dairy analog products, cream-based sauces, protein and nutritional powders, ready-to-drink (RTD) protein beverages, non-dairy beverages, and batter/breading/coating for frying at levels ranging from 0.08% to 40% in the finished products.

Stability

Cargill's corn protein product is considered to be stable for 24 months when stored under recommended storage conditions, *i.e.*, in a cool (20-30°C), dry location and in the original sealed package away from odorous material. Similar shelf-lives have been determined for other plant-based proteins previously concluded to be GRAS, e.g. pea protein was stable for 24 months at 25°C (GRN Nos. 608, p. 000013), oat protein was stable for 18 months at room temperature (GRN No. 575, p. 000024), potato protein was stable for 36 months at 40°C (GRN No. 447, pp. 13-15), mung bean protein was stable at room temperature for 6 months (interim results from 24-month stability study) (GRN No. 684, pp. 21-22), and canola protein isolate was stable for 16 weeks at 40°C (data supporting shelf-life declaration of 15 months at 25°C) (GRN No. 683, p. 18). Corn protein also has low water activity and low fat/oil content which limits the possibility of microbial growth and contamination of the product. There are no known degradation products of safety concern associated with corn protein.

§ 170.235 Part 3, Dietary Exposure

Proposed Maximum Use Levels of Corn Protein

Corn protein is proposed for use as a source of protein and for functional uses such as thickening, water absorption, fat/oil absorption, solid fat emulsification, and gelation of bakery products, cooked pasta (from fresh or dry), ready-to-eat (RTE) cereals, meat analogs & vegetarian products, snack foods, nutrition bars, mixed dishes with sauce, nut butters (excluding full-fat peanut butter), dairy analog products, cream-based sauces, protein and nutritional powders, ready-to-drink (RTD) protein beverages, non-dairy beverages, and batter/breading/coating for frying at the levels presented in Table 6. These food categories and use levels are consistent with those uses previously recognized as GRAS for other plant-derived proteins (e.g., p. 000010 of GRN No. 134 for soy, p. 000035 of GRN No. 386 for canola, p. 000026 of GRN 575 for oat protein, p. 19 of GRN No. 581 for pea protein, pp. 000014-15 of GRN 608 for pea protein concentrate, pp. 000019-20 of GRN No. 26 for wheat protein, pp. 000081-82 GRN No. 609 for rice protein, p. 4 of GRN No. 447 for potato protein, pp. 5-6 of GRN 684 for mung bean protein, pp. 7-8 of GRN 683 for canola protein isolate, and the Agency Response Letter to GRN 788 for pea protein concentrate [FDA, 2018]).

Table 6. Proposed Food Uses and Levels of Corn Protein

Food Category	Examples	Use Level (%) Corn Protein, As Consumed
Bakery products	Bakery products including flatbread and pizza crust (all types including gluten-free), gluten-free biscuits, bread, English muffins, and muffins	5
Batter/breading/coating for frying	Batter/breading/coating for frying	2
Cereal, Ready-to-Eat (RTE)	RTE cereal, all types	15
Dairy analog products	All types of dairy analog products including imitation cheese and sour cream, cream substitute, non-dairy topping, margarine and margarine-like spreads, tofu frozen dessert, rice dessert bar, ices and sorbet	2
Meat analogs & vegetarian food products	Meat analogs & vegetarian food products including vegetable protein, vegetarian meat loaf, vegetarian stew, meatless bacon, chicken analogs, breakfast link, fish stick, vegetarian frankfurter, luncheon meat, meatball, vegetarian burger or patty, vegetarian dishes (i.e., pot pie, chili, stew, stroganoff)	40
Mixed dishes with sauce	Prepackaged products with sauce including frozen meals; canned products such as Chef Boyardee products and creamed vegetables; box mixes such as Hamburger Helper, Rice-A-Roni, Easy Mac, and scalloped and mashed potato; pot pie	0.08
Non-dairy beverages	Milk substitutes including soy milk, almond milk, rice milk, coconut milk, and other imitation milks	12
Nut butters (except full-fat peanut butter	Nut butters including almond, cashew, and peanut (excluding full-fat peanut butter)	10
Nutritional bars	Nutrition and meal replacement bars including Zone Perfect, CLIF bar, South Beach Living bars, Kashi bars, PowerBar, SlimFast bar, Snickers Marathon energy, protein bars	25
Pasta, cooked	Cooked pastas including macaroni, spaghetti noodles, lasagna noodles, ravioli, other pasta noodles	5

Food Category	Examples	Use Level (%) Corn Protein, As Consumed
Processed meats	Processed meats including sausage, luncheon meats, frankfurter, cured ham, pastrami, pate, pepperoni, salami, chicken nuggets, patties	10
Protein and nutritional powders	Non-reconstituted powder mix including Carnation Instant Breakfast, Muscle Milk, Slim Fast, protein powder/mix, milkshake mix	3
Protein beverages, Ready-to-Drink (RTD)	RTD nutritional drink or meal replacement beverage high in protein	3
Sauces, cream-based	Cream-based sauces including cheese sauce, cream sauce, milk sauce, lemon-butter sauce, hollandaise sauce, horseradish sauce	1.5
Snack foods	Snack foods including cereal and granola bars, crackers, extruded potato chips, pretzel/snack mix, tortilla chips, corn chips, other veggie/puff chips	15

RTE: Ready-to-eat
RTD: Ready-to-drink

Estimated Daily Intake of Corn Protein

Available Data and Methods

The estimated daily intake (EDI) of corn protein from the proposed uses was estimated based on the proposed use levels in Table 6, using Exponent Inc.'s Foods and Residue Evaluation Program (FARE™ version 13.03) software and data from the most recent National Health and Nutrition Examination Survey (NHANES 2013-2016). Individual food codes selected for inclusion in each proposed use category are provided in Appendix 2.

The NHANES 2013-2014 and 2015-2016 (NCHS, 2016, 2018) is a complex multistage probability sample designed to be representative of the civilian US population. The survey collects two days of food intake data, in addition to nutrition, demographic, and health information. Exponent Inc. used the statistically weighted values from the survey in the analyses. The statistical weights compensate for variable probabilities of selection, adjust for non-response, and provide intake estimates that are representative of the US population and the selected age subgroups.

Exponent Inc. estimated the daily intake on a "*per capita*" and "per user" basis. *Per capita* estimates refer to the consumption based on the entire population of interest whereas per user estimates refer to those who reported consuming any of the foods within a given food product category on either of the survey days. In this analysis, a "user" is anyone who reported consuming at least one category of food in which it is proposed to use corn protein (corn protein food category) on either of the survey days, *i.e.*, United States Department of Agriculture's (USDA's) "user" definition. Each individual who reported consuming a proposed food on either of the survey days was identified, and that individual's responses for both survey days was used. Because corn protein is likely to be consumed over a lifetime, it is appropriate to average exposures over a longer period than one day. Therefore, Exponent Inc. used each respondent's food consumption averaged over the two days of the NHANES 2013-2014 and 2015-2016 surveys. A 2-day average typically overestimates lifetime average daily intake especially for foods consumed infrequently; however, only two nonconsecutive days' worth of food consumption data are available in the most recent NHANES 2013-2014 and 2015-2016 surveys database. It is well known that food consumption data collected over longer periods of time, *e.g.*, 14 days as in Market Research Corporation of America (MRCA) consumer surveys, yield estimates of daily intake that may be significantly lower than 2-day averages (Lambe *et al.*, 2000). Therefore, actual consumer exposures to corn protein are anticipated to be lower than the estimates reported herein.

Estimated Daily Intake

The EDI of corn protein was calculated by multiplying each NHANES respondents' 2-day average food intake by the use levels described in Table 6, above. Each individual's intake of corn protein was divided by his/her body weight to provide the *per capita* and per user intakes on a body weight basis. Mean and 90th percentile daily intakes on a *per capita* and per user basis, as g corn protein/day and mg corn protein/kg bw/day, were estimated for the proposed uses of corn protein for the US population (Table 7).

Table 7. Two-day Average Estimated Daily Intake of Corn Protein from Proposed Uses at Maximum Use Levels (Total US Population)

Food Category	N[1]	% Users	*Per Capita* Intake of Corn Protein (g/day)		Per User Intake of Corn Protein (g/day)		*Per Capita* Intake of Corn Protein (g/kg bw/day)		Per User Intake of Corn Protein (g/kg bw/day)	
			Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile
Bakery products	4,985	36	1.1	3.9	3.2	6.4	0.02	0.06	0.05	0.11
Batter/breading/coating for frying	3,325	22	0.1	0.3	0.4	0.7	<0.005	<0.005	0.01	0.01
Cereal, RTE	5,180	35	1.8	6.3	5.3	10.0	0.03	0.11	0.10	0.20
Dairy analog products	7,050	52	0.1	0.4	0.3	0.7	<0.005	0.01	<0.005	0.01
Meat analogs & vegetarian food products	246	2	0.4	0	17.0	38.4	0.01	0	0.25	0.76
Mixed dishes with sauce	2,323	17	<0.05	0.1	0.1	0.2	<0.005	<0.005	<0.005	<0.005
Non-dairy beverages	711	6	1.1	0	20.1	41.1	0.02	0	0.39	0.72
Nut butters (except full-fat peanut butter)*	162	2	<0.05	0	1.8	3.2	<0.005	0	0.03	0.07
Nutritional bars	291	3	0.3	0	8.9	16.2	<0.005	0	0.13	0.24
Pasta, cooked	4,618	32	1.3	4.5	4.0	7.8	0.02	0.08	0.07	0.16
Processed meats	9,885	69	3.4	8.8	4.8	10.4	0.06	0.15	0.08	0.19
Protein and nutritional powders	297	3	<0.05	0	1.1	1.9	<0.005	0	0.02	0.03
Protein beverages, RTD*	166	2	0.2	0	9.9	19.1	<0.005	0	0.14	0.29

Food Category	N[1]	% Users	*Per Capita* Intake of Corn Protein (g/day)		Per User Intake of Corn Protein (g/day)		*Per Capita* Intake of Corn Protein (g/kg bw/day)		Per User Intake of Corn Protein (g/kg bw/day)	
			Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile
Sauces, cream-based	1,105	8	<0.05	0	0.5	1.0	<0.005	0	0.01	0.02
Snack foods	7,413	55	2.2	6.3	4.0	8.4	0.04	0.11	0.08	0.17
Total (all proposed foods)	13,842	97	12.2	24.1	12.5	24.3	0.22	0.48	0.22	0.49

[1] Unweighted number of users; %user, per user estimates for NHANES derived using the statistical weights provided by the NCHS.

* Sample size inadequate to provide reliable estimates at the per user 90th percentile of intake.

Approximately 97% of the total US population surveyed was identified as potential consumers of corn protein from its proposed food uses (13,842 users identified). On a *per capita* basis, mean and 90th percentile intakes of corn protein from all proposed food uses by the total US population were estimated at 0.22 and 0.48 g/kg bw/day (equivalent to 12.2 and 24.1 g/day), respectively. On a per user basis, the total EDI for corn protein from all proposed uses assuming the maximum proposed use level for each food category is 0.22 g/kg bw/day at the mean and 0.49 g/kg bw/day at the 90th percentile (equivalent to 12.5 g/day and 24.3 g/day, respectively). A further breakout of estimated corn protein intakes by age subgroups is shown below in Table 8.

Table 8. Two-day Average Estimated Daily Intake of Corn Protein from All Proposed Uses (Maximum Use Levels) by Population Subgroup (Infants, Children, Teenagers, and Adults)

Population	Users[1]	% Users	*Per Capita* Intake of Corn Protein (g/day)		Per User Intake of Corn Protein (g/day)		*Per Capita* Intake of Corn Protein (g/kg bw/day)		Per User Intake of Corn Protein (g/kg bw/day)	
			Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile
Infants 0-11 months	194[2]	29	0.8	2.8	2.9	7.4	0.10	0.29	0.33	0.75
Children 1-6 years	1,725	99	11.1	19.8	11.2	19.9	0.68	1.17	0.68	1.18
Children 7-12 years	1,691	99	13.1	23.9	13.2	23.9	0.38	0.68	0.38	0.68
Adolescents (13-19 years)	1,802	99	13.7	25.9	13.8	25.9	0.21	0.41	0.21	0.41
Adults ≥ 20 years	8,430	98	12.2	24.4	12.5	24.6	0.16	0.31	0.16	0.31
Total US Population	**13,842**	**97**	**12.2**	**24.1**	**12.5**	**24.3**	**0.22**	**0.48**	**0.22**	**0.49**

[1] Unweighted number of users; % user, per user estimates for NHANES derived using the statistical weights provided by the NCHS.

[2] Note: Sample size is just slightly above the threshold (i.e. 193) for flagging of statistically unreliable 90th percentile consumption values. See additional details in Appendix 3 (Exponent, 2019).

On a body weight basis, the highest per user mean and 90th percentile intake estimates for corn protein are among children 1-6 years at 0.68 g/kg bw/day and 1.18 g/kg bw/day, respectively. The next highest per user intake levels on a body weight basis are among infants 0-11 months with mean and 90th percentile estimates of 0.33 g/kg bw/day and 0.75 g/kg bw/day, respectively, and children 7-12 years with mean and 90th percentile estimates of 0.38 g/kg bw/day and 0.68 g/kg bw/day, respectively. However, it should be noted that the sample size of 194 for infants is just slightly above the threshold (i.e. 193) for flagging of statistically unreliable 90th percentile consumption values (see additional details in Appendix 3 [Exponent, 2019]). The range of intake estimates among the remaining population subgroups (adolescents and adults) are similar to or lower than the total population EDI, e.g., 0.16 to 0.21 g/kg bw/day (mean) and 0.31 to 0.41 g/kg bw/day (90th percentile), respectively.

Discussion

As noted in the EDI report (Exponent, 2019; Appendix 3), the above estimates based on 2-day average intakes do not necessarily represent long-term intakes, because (1) they may not capture infrequent consumers of foods proposed to contain corn protein, (2) they assume that subjects who consumed corn protein-containing products on both survey days actually consume these corn protein products every day of the year, and (3) they do not adjust for potential day-to-day variation in corn protein intake. A 2-day average typically overestimates long-term (chronic) daily intake and does not necessarily represent long-term intakes.

As discussed further below (§ 170.250 Part 6, GRAS Narrative), there are no safety concerns associated with these worst-case, conservative intake estimates for corn protein from proposed food categories and use levels.

Corn protein is intended to be an alternative source of protein for current uses in food and is not expected to result in an increase in the overall consumption of protein. The minimum daily protein intake values recommended by the FDA (Daily Reference Values, DRV) and Institute of Medicine (IOM) (Recommended Dietary Allowances, RDA) are

50 g/day or 56/46 g/day (males/females) for adults, respectively (FDA, 2016; IOM, 2002/2005), while USDA reports that the 90th percentile intake of protein from food and beverages ranges from 68.3-139.1 g/day (USDA, 2015a). Therefore, even at the most conservative, upper range of estimated intake for the total US population (*i.e.*, 24.3 g/day at the 90th percentile per user intake estimate) based on NHANES dietary survey data, the proposed uses of corn protein would contribute only a small portion of the background protein consumption in the US, or the dietary protein recommendations of the FDA and IOM.

Therefore, as an alternative/replacement source of protein for current uses in food, the proposed uses of the corn protein will not result in an increase in the overall consumption of protein, but simply will provide an alternative source of well-characterized protein from corn for use in food. Therefore, cumulative intake analysis is not considered necessary.

§ 170.240 Part 4, Self-limiting Levels of Use

The use of corn protein as a food ingredient is limited by the level that can technically be added to a given food without compromising its quality and consumer acceptability.

§ 170.245 Part 5, Experience Based on Common Use in Food

General recognition of safety for the notified substance, corn protein, is established through scientific procedures; therefore, information regarding experience based on common use of the notified substance in food prior 1958 is not applicable. The historical consumption of corn and protein is discussed below in § 170.250 Part 6 (GRAS Narrative) as supporting information.

§ 170.250 Part 6, GRAS Narrative

Introduction

This section of the GRAS Notice fulfills the requirements of 21 CFR §170.250 by providing a narrative in regard to the generally available and accepted scientific data, information, methods, or principles that are relied on to establish safety.

Historical Consumption of Corn

Corn [also referred to as "maize" (*Zea mays*) and belonging to the grass family (*Gramineae*)], is one of the most important cereal grains in the world, providing nutrients for humans and animals and serving as a basic raw material for the production of starch, oil and protein, alcoholic beverages, and food sweeteners (FAO, 1992). As such, corn and its proteins have been part of the normal human diet for centuries, with the earliest recorded presence of the crop in Mexico reported as early as 8700 BP[2] (Piperno, 2011).

Modern food uses of corn (maize) include use of the whole grain, or processing of the maize by wet or dry milling techniques to obtain a variety of intermediary products (*e.g.*, maize grits/meal/flour *via* dry milling, maize starch and maize gluten *via* wet milling) (FAO, 1992). As described above, the corn protein that is the subject of this GRAS conclusion is obtained *via* wet milling of maize to yield corn gluten meal, from which protein is recovered. Protein content in the various parts of the corn (maize) kernel range from 3.7% in the pericarp to approximately 8% in the endosperm, and 18.4% in the germ (FAO, 1992).

[2] BP = "Before Present" (i.e. before 1950 as the commencement of radiocarbon dating)

Nutritional and Safety Considerations for Protein Intake

The IOM (2002/2005) minimum RDA for protein is 0.8 g/kg bw/day for adults, which corresponds to RDAs of 56 g/day and 46 g/day for adult men and women (>19 years of age), respectively. IOM (2002/2005) also recommends that adults should get 10 to 35 percent of their calories from protein. The FDA has established a protein daily reference value (DRV) of 50 g/day for adults and children four years of age or older (FDA, 2016). However, neither the RDA nor DRV represent an upper limit of consumption. The World Health Organization (WHO) recommends body weight-based protein consumption rates for both genders, noting that individuals involved in bodybuilding ingest much higher levels of protein (WHO, 2007). For example, the safe protein consumption level for a 40-kg adult is 33 g/day, and that for an 80-kg adult is 66 g/day (equivalent to 0.83 g/kg per day for proteins with a protein digestibility-corrected amino acid score value of 1.0) (WHO, 2007).

Safe protein consumption levels for children ages 1-6 range from 11.6-17.1 g/day for boys (10.2-19.7 kg body weight) and 10.8-16.2 g/day for girls (9.5-18.6 kg body weight) based on maintenance and growth requirements for each age group (WHO, 2007). For children ages 7-12, safe protein consumption levels range from 25.9-40.5 g/day for boys (28.1-45.0 kg body weight) and 26.2-41.0 g/day for girls (28.5-46.1 kg body weight) (WHO, 2007). Estimated consumer intake levels for corn protein (§ 170.235 Part 3, Dietary Exposure) in these subpopulations (i.e. conservative 90th percentile estimates of 19.9 g/day for children 1-6 years and 23.9 g/day for children 7-12 years) and are similar to or slightly above the range of safe protein consumption levels identified by WHO. However, while WHO stated that no safe upper limit had been identified, they also indicated that it is unlikely that intakes of twice the safe level are associated with any risk. Caution was advised to those contemplating the very high intakes of 3 to 4 times the safe level, since such intakes approach the tolerable upper limit and cannot be assumed to be risk-free (WHO, 2007). Based on NHANES 2007-2010 survey data, the USDA reports that the 90th percentile intake of protein from food and beverages ranges from 68.3-139.1 g/day for males and females ≥ 1 year (USDA, 2015a). Although the average intakes of protein foods subgroups vary in comparison to the range of intake

recommendations, particularly among adult males, overall average intakes of protein foods are close to amounts recommended for all age-gender groups (USDA, 2015b).

Regulatory Status of Similar Materials

Zein (CAS Reg. No. 9010–66–6) is a corn gluten extract with GRAS affirmed status as a direct food additive used as a "surface-finishing agent" at levels not to exceed current good manufacturing practice or cGMP (21CFR184.1984). Corn gluten (CAS Reg. No. 66071-96-3), also known as corn gluten meal, is the principal protein component of corn endosperm, consisting mainly of zein and glutelin, and was also affirmed as GRAS for use as a nutrient supplement and a texturizer in food at levels not to exceed current good manufacturing practice (21CFR§184.1321).

To date, FDA has reviewed extensive information and data as part of GRAS notifications for other plant protein isolates and concentrates and subsequently issued "no questions letters" (e.g., GRN No. 26 (isolated wheat protein); GRN No. 134 (soy protein); GRN No. 609 (rice protein); GRN 386 (canola protein isolate and hydrolyzed canola protein isolate); GRN No. 447 (potato protein isolates); GRN No. 575 (oat protein), GRN No. 581 (pea protein), GRN Nos. 608 and 788 (pea protein concentrate), GRN No. 683 (canola protein isolate), and GRN 684 (mung bean protein isolate). Cargill considers the data and information contained within these GRAS Notifications (including that which is published and that which is unpublished but corroborative) to be supportive of the current GRAS conclusion for corn protein. Specifically, these Notifications present data and information confirming that there is a history of safe consumption of the source plants and their proteins, there are no toxicologically or clinically relevant effects observed in studies where these plant proteins were fed to animals or humans, and estimated consumer intake levels for these plant proteins are consistent with established RDAs (IOM 2002/2005) or safe consumption values (WHO, 2007) for protein [pp. 000008-000009 of GRN No. 26 (isolated wheat protein); pp. 000015-000019 of GRN No. 134 (soy protein); pp. 000083-000092 of GRN No. 609 (rice protein); pp. 000028-000036 of GRN 386 (canola protein isolate and hydrolyzed canola protein isolate); pp. 17-20, 23-34 of GRN No. 447 (potato protein isolates); pp. 000029-000042 of GRN No. 575 (oat

protein), pp. 23-31 of GRN No. 581 (pea protein), pp. 000017-18, 000021-24, 000025 of GRN No. 608 (pea protein concentrate), pp. 39-59 of GRN No. 683 (canola protein isolate), pp. 27-38 of GRN 684 (mung bean protein isolate), and the Agency Response Letter to GRN 788 for pea protein concentrate (FDA, 2018)].

Overview of Safety Database Supporting Safety Evaluation of Corn Protein

With the long history of safe human consumption of corn and its proteins, traditional toxicology and clinical safety studies on corn protein are not available in the published literature, but there are no known reports of adverse health effects related to corn or its proteins. A comprehensive literature search was conducted using National Library of Medicine (NLM) TOXNET sources as well as subscription-based literature database access (*i.e.*, ToxPlanet, Timberlake Ventures, Inc.) to confirm that no relevant safety studies are available for corn protein. The initial search was performed in October 2015 and an updated search was performed on 2 April 2019 for all relevant publications to date. A major corn protein, zein hydrolysate (ZeinH), has been studied for its potential to stimulate glucagon-like peptide-1 (GLP-1) secretion in experimental animals *via* ileal administration and oral administration, as a possible method for attenuating postprandial hyperglycemia in humans. Although safety endpoints were not monitored in these studies, no adverse effects were reported (Hira *et al*., 2009; Higuchi *et al*., 2013).

The human metabolic pathway for protein and amino acids is well understood and would be similar for corn protein supporting its safety. Briefly, dietary proteins undergo acid-catalyzed or enzymatic hydrolysis to yield individual amino acids which are further broken down by deamination, yielding amino acid carbon skeletons (α-keto acids) that can be converted to common metabolic intermediates (Voet and Voet, 1995). Amino groups resulting from deamination are converted either to ammonia or to the amino group of aspartate which may be excreted in the urine unchanged or as urea (Voet and Voet, 1995).

Food allergy to maize, although relatively rare, has been reported in the literature (Scibilia *et al.*, 2008; Pastorello *et al.*, 2009; Goodman *et al.*, 2013; Krishnan and Chen, 2013). The primary maize allergen responsible for food-induced allergic reactions is a nonspecific lipid transfer protein (LTP), which is considered a pathogenesis-related protein that may be induced by stress (Goodman *et al.*, 2013; Pastorello *et al.*, 2000; Pastorello *et al.*, 2009). Corn (maize) is not listed as one of eight major allergen groups by the FDA under the Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II); however, formulated finished food product ingredient lists would state the presence of a corn protein ingredient and individuals who wish to avoid corn protein consumption for any reason would be able to identify the presence of a corn-derived ingredient.

Safety Evaluation of Potential Corn Protein Impurities and Contaminants

Current food-grade specifications and quality controls for corn protein (see Part 1) ensure that potential impurities and contaminants of safety concern (*e.g.*, sulfur dioxide, residual solvent ethyl alcohol, residual ethyl acetate, mycotoxins, heavy metals, and pesticides) are absent from the processed material or present at levels below applicable US and/or EU Maximum Contaminant Levels or Action Levels for foods, or at levels that do not present a safety concern based on relevant Acceptable Daily Intakes (ADIs), Tolerable Daily Intakes (TDIs), or Provisional Maximum Tolerable Daily Intakes (PMTDIs). The safety assessment for each of these impurities and contaminants at maximum potential exposure levels is discussed below.

Zearalenone

A maximum concentration limit for zearalenone in corn protein is set at ≤200 ppb; therefore, even the worst-case potential dietary intake of zearalenone through consumption of formulated food products containing corn protein (*e.g.*, conservative 90th percentile estimate for the Total US Population of 490 mg/kg bw/day corn protein ingested x 200 ppb zearalenone = 0.1 µg/kg bw/day) would be sufficiently below the TDI of 0.25 µg/kg bw/day for zearalenone established by the European Food Safety Authority (EFSA) (EFSA, 2011). Adequate margins of safety compared to this TDI also exist for

worst-case estimates of corn protein intake among population subgroups (*e.g.*, conservative 90th percentile estimate of 1180 mg/kg bw/day corn protein ingested for children ages 1-6 years x 200 ppb zearalenone = 0.24 µg/kg bw/day). The EFSA TDI is considered an appropriate and conservative benchmark value for safety assessment in the absence of an FDA-derived ADI or TDI for zearalenone.

As indicated in Table 3, zearalenone was not detected (LOD: 50 ppb) in representative batches of corn protein.

Fumonisins

A maximum concentration limit for fumonisins in corn protein is set at ≤1.5 ppm; therefore, even the worst-case potential dietary intake of fumonisins through consumption of formulated food products containing corn protein (*e.g.*, conservative 90th percentile estimate for the Total US Population of 490 mg/kg bw/day corn protein ingested x 1.5 ppm fumonisins = 0.74µg/kg bw/day) would be sufficiently below the Provisional Maximum Tolerable Daily Intake (PMTDI) of 2 µg/kg bw/day for fumonisins established by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) in 2001 and maintained at the JECFA re-evaluations completed in 2011 and 2016 re-evaluations (JECFA, 2001, 2011, 2016). Adequate margins of safety compared to this PMTDI also exist for worst-case estimates of corn protein intake among population subgroups (*e.g.*, conservative 90th percentile estimate of 1180 mg/kg bw/day corn protein ingested for children ages 1-6 years x 1.5 ppm fumonisins = 1.77 µg/kg bw/day). A variety of research areas were identified at the fifty-sixth meeting (JECFA, 2011) in order to investigate the biochemical and physiological mechanism(s) underlying fumonisin-induced renal and hepatic toxicity or carcinogenicity. At the seventy-fourth meeting (JECFA, 2011), the Committee used a short-term dose–response study of liver toxicity in male transgenic mice fed diets containing purified fumonisin B1 (FB_1) to derive a group PMTDI for FB_1, FB_2 and fumonisin B3 (FB_3), alone or in combination, of 2 µg/kg bw on the basis of a lower 95% confidence limit on the benchmark dose for a 10% response ($BMDL_{10}$) of 0.165 mg/kg bw per day and an uncertainty factor of 100. At the eighty-third meeting (JECFA, 2016), the Committee concluded that they would not

change the overall toxicological assessment performed previously; thus, the previously established group PMTDI of 2 μg/kg bw for FB_1, FB_2 and FB_3, alone or in combination, was retained by the current Committee. The JECFA PMTDI is considered an appropriate benchmark value for safety assessment in the absence of an FDA-derived ADI or TDI for fumonisins.

As indicated in Table 3, fumonisin was not detected (LOD: 0.1 ppm) in representative batches of corn protein.

Aflatoxins

A maximum concentration limit for aflatoxins in corn protein is set at ≤5 ppb; therefore, the worst-case potential dietary intake of aflatoxins through consumption of formulated food products containing corn protein (*e.g.*, conservative 90th percentile estimate for the Total US Population of 490 mg/kg bw/day corn protein ingested x 5 ppb aflatoxins) is 2.5 ng/kg bw/day. This intake level is within the range of international estimates of background dietary exposure to aflatoxins (*i.e.*, 0.4-3.7 ng/kg bw/day) as reported by JECFA (2007). Aflatoxins are considered to be genotoxic carcinogens that induce tumors in the liver of animals and humans; therefore, a tolerable intake level for aflatoxins has not been established. The JECFA committee has stated that the reduction of aflatoxins dietary exposure is an important public health goal; particularly in populations who consume high levels of any food that may potentially be contaminated with aflatoxins (JECFA, 2007). The FDA Action Level for aflatoxins in human food is 20 ppb (*i.e.*, 4-fold higher than the acceptable limit for aflatoxins in corn protein) (FDA, 2005). As indicated in Table 3, aflatoxins were not detected (LOD: 1 ppb) in representative batches of corn protein.

Most recently, JECFA evaluated co-exposure to fumonisins and aflatoxins considering that both mycotoxins are frequent contaminants in cereal (including maize), and co-exposure to both mycotoxins is likely in areas where these foods are consumed as part of the routine diet (JECFA, 2016). Although evidence in laboratory animals has suggested an additive or synergistic effect of fumonisin and aflatoxin co-exposure in the

development of preneoplastic lesions or hepatocellular carcinoma, currently no data are available on such effects in humans (JECFA, 2016). The Committee concluded that there are few data available to support co-exposure as a contributing factor in human disease; however, the interaction between aflatoxin B1, a compound with known genotoxic properties, and fumonisins, which have the potential to induce regenerative cell proliferation (particularly at exposures above the PMTDI), remains a concern (JECFA, 2016). Based on current specifications for corn protein, potential exposure to fumonisins and aflatoxins is low even based on conservative estimates of consumer intake for corn protein under intended conditions of use, and do not present a safety concern.

Ethyl alcohol

Regarding the potential intake of ethyl alcohol (EtOH, residual solvent) by corn protein consumers, the maximum level of EtOH in corn protein is of 60 g/kg, or 6% which would yield a calculated/theoretical maximum daily exposure level of 29.4 mg EtOH/kg bw/day (90^{th} percentile estimate for the Total US Population of 490 mg/kg bw/day corn protein ingested x 6% EtOH) or 1.76 g EtOH/day for a 60 kg adult, assuming a worst-case upper estimate of intake for all proposed food categories at the maximum use level of corn protein. The worst-case calculated/theoretical maximum daily exposure level of EtOH among population subgroups is 70.8 mg EtOH/kg bw/day (90^{th} percentile estimate of 1180 mg/kg bw/day corn protein ingested for children ages 1-6 years x 6% EtOH) or 01.1 g EtOH/day for a 15 kg child, assuming a worst-case upper estimate of intake for all proposed food categories at the maximum use level of corn protein. Spread throughout the course of a day, the amount of EtOH potentially present in corn protein containing foods would be substantially less than the average level of EtOH in a non-alcoholic beverage (defined as having an alcoholic content of less than 0.5% alcohol[3]), *i.e.*, 1.4 g EtOH, assuming 355 mL at 0.5%, specific gravity of 0.794 g/mL. Additionally, residual EtOH levels in corn protein products for consumption are expected to be minimal due to evaporation as most/all of the proposed products will be heated during processing and/or cooking prior to ingestion. The USDA Table of Nutrient Retention Factors (Release 6)

[3] "Electronic Code of Federal Regulations". United States Government. Retrieved 29 April 2015. See 27 §7.71, paragraphs (e) and (f).

demonstrates a steady decrease in EtOH content with heating (baking or simmering) of alcoholic beverages over time (*e.g.*, retention factor reduced from 40% after 15 minutes to 5% after 2.5 hours) (USDA, 2007).

Ethyl acetate

Regarding the potential intake of ethyl acetate (SDA 35A solvent denaturant) by corn protein consumers, the maximum level of ethyl acetate in corn protein is 1000 mg/kg, or 0.1% which would yield a calculated/theoretical maximum daily exposure level of 0.49 mg ethyl acetate/kg bw/day (90^{th} percentile estimate for the Total US Population of 490 mg/kg bw/day corn protein ingested x 0.1% ethyl acetate), assuming a worst-case upper estimate of intake for all proposed food categories at the maximum use level of corn protein. This conservative intake estimate for ethyl acetate is 51-fold less than the JECFA ADI of 25 mg/kg bw/day (JECFA, 1996). Adequate margins of safety compared to this ADI also exists for worst-case estimates of corn protein intake among population subgroups (*e.g.*, conservative 90^{th} percentile estimate of 1180 mg/kg bw/day corn protein ingested for children ages 1-6 years x 0.1% ethyl acetate = 1.18 mg/kg bw/day). The JECFA ADI is considered an appropriate and conservative benchmark value for safety assessment in the absence of an FDA-derived ADI or TDI for ethyl acetate.

Sulfur dioxide

With respect to potential sulfur dioxide (SO_2) intake by corn protein consumers, the maximum level of SO_2 in corn protein is 100 mg/kg, or 0.01% which could result in a maximum daily exposure level of 0.05 mg SO_2/kg bw/day (90^{th} percentile estimate for the Total US Population of 490 mg/kg bw/day corn protein ingested x 0.01% SO_2), assuming a conservative upper estimate of corn protein intake. JECFA (2000) established an ADI of 0.7 mg/kg bw for sulfites (used as antioxidants/preservatives) based on long-term studies in rats, including a 3-generation study of reproductive toxicity with a No-Observed-Effect-Level (NOEL) of 2.5 g/kg (0.25%) sodium metabisulfite in the diet, equivalent to 70 mg/kg bw/day of sulfur dioxide equivalents. Therefore, the conservatively estimated potential daily intake of SO_2 from proposed food uses of corn protein would be 14 times lower than the ADI for sulfites established by JECFA. An

adequate margin of safety compared to this ADI also exists for worst-case estimates of corn protein intake among population subgroups (*e.g.*, conservative 90th percentile estimate of 1180 mg/kg bw/day corn protein ingested for children ages 1-6 years x 0.01% SO_2 = 0.12 mg/kg bw/day). Additionally, the residual levels of SO_2 in finished food products containing corn protein as an ingredient are not expected to trigger labeling requirements (21 CFR§130.9) for sulfiting agents under the proposed conditions of use in foods.

Discussion of Potential Safety Concerns Regarding High Protein Intake

Although the proposed food uses of corn protein are expected to result in consumption amounts well below the safe protein ingestion levels recommended by the WHO (2007) (*i.e.*, 33-66 g/day for adults depending on body weight, 10.8-17.1 g/day for children ages 1-6, and 25.9-41.0 g/day for children ages 7-12), potential adverse effects associated with consumption of extremely high levels of protein have been reported in the literature and are discussed herein for completeness.

Preterm infants who were fed high-protein formula (reported daily protein intakes of 6 to 7.2 g/kg bw) exhibited poor feeding, fever, lethargy, and low IQ scores and strabismus at 3- and 6-year evaluations (Goldman *et al*., 1971; 1974). In individuals consuming diets consisting of 45% of their dietary energy as protein (from rabbit meat), diarrhea and nausea occurred after 3 days, and death within a few weeks (Speth and Spielmann, 1983). As this study included a very unusual dietary situation, the results are not considered relevant to the safety assessment of corn protein. Cargill's corn protein product is not intended for use in infant formula.

Excess protein intake has been found to advance chronic kidney disease due to increased glomerular pressure and hyperfiltration (Martin *et al*., 2005; WHO, 2007). However, following a comprehensive review of the literature, Martin *et al*. (2005) concluded that the existing evidence does not indicate an adverse effect of high protein consumption on renal function in healthy individuals. Further, several studies indicate that hyperfiltration, the reported mechanism for kidney effects, is a normal adaptive response to increased

demands for renal clearance due to higher nitrogen load. The authors defined a "high protein diet" as a daily intake of ≥1.5 g/kg-day, which is nearly double the current recommended intake level set by the IOM. Increased dietary consumption of animal protein has been found to accelerate this renal clearance disorder in patients with preexisting kidney disease, but the association did not occur in persons with healthy kidney function (Martin *et al*., 2005). The proposed uses of Cargill's corn protein product are not expected to result in high protein intake levels such as those associated with renal function decrements.

While excess protein intake may adversely impact the body's calcium balance and calcium concentration in bone, the existing evidence indicates that dietary protein, when consumed as part of a well-balanced diet, is likely beneficial for bone, potentially even at dietary levels exceeding the recommended consumption rates (WHO, 2007). A high-protein diet may also lead to increased incidence of kidney stone formation due to increased urinary calcium and oxalate levels; however, relevant clinical studies report a wide range of protein consumption rates (*e.g.*, 80-185 g/day) and were therefore considered inconclusive by WHO (2007). Additional research is also needed to determine potential differences between animal and plant protein intake relative to the incidence of kidney stone formation. To allow for the present uncertainty, WHO (2007) recommends that in order to minimize the risk of kidney stones in patients who are at risk, the diet should ideally provide at least the safe level of protein (0.83 g/kg per day), but not excessive amounts (*i.e.*, less than 1.4 g/kg per day), preferably from vegetable sources.

High protein consumption is considered a risk factor for development of gout (Choi *et al*., 2004). In a large prospective cohort study, Choi and colleagues (2004) tracked 47,150 American men (ages 40-75 years old in 1986) during a 12-year period and observed 730 new cases of gout. While the consumption of meat and seafood was associated with an increased risk of gout (relative risk of 1.41 and 1.51, respectively), total protein intake was not associated with gout incidence.

As stated above, the proposed uses and consumption of corn protein in the specified foods is not expected to raise concerns regarding the above safety-related outcomes.

Safety Evaluation Summary & Discussion

Corn and its proteins have a long history of safe human consumption and there are no known reports of adverse health effects associated with dietary intake of corn, or its protein at the levels proposed herein.

The focus of this GRAS determination is a comprehensive assessment of the safety of corn protein as a source of protein for enrichment of processed foods, similar to that of other plant-based protein sources such as soy, canola, oats, lentils, wheat, rice, potato, peas, and whey. The Institute of Medicine (IOM, 2002/2005) recommends that adults consume a minimum of 0.8 g protein/kg and has set a range for acceptable protein intake of 10 - 35% of daily calories. In the US, the recommended daily allowance (RDA) of protein is 56 grams/day and 46 grams/day for adult men and women (>19 years of age), respectively. The FDA (2015) has established a protein daily reference value (DRV) of 50 g/day for adults and children four years of age or older. However, as the RDA represents the amount of protein that is recommended to meet a person's basic nutritional requirements, it does not represent an upper limit of consumption.

Similar plant-derived protein products are currently available in the marketplace. To date, the FDA has reviewed data as part of GRAS notifications for a number of plant-based protein isolates and concentrates and subsequently issued "no questions letters" [*i.e.*, GRN No. 26 (isolated wheat protein); GRN No. 134 (soy protein); GRN 386 (canola protein isolate and hydrolyzed canola protein isolate); GRN No. 447 (potato protein isolates); GRN No. 575 (oat protein); GRN No. 581 (unhydrolyzed and hydrolyzed pea protein); GRN Nos. 608 and 788 (pea protein concentrate); GRN No. 609 (rice protein); GRN No. 683 (canola protein isolate); and GRN 684 (mung bean protein isolate)]. Cargill considers the data and information supporting the GRAS conclusions for these ingredients (including that which is published and that which is unpublished but corroborative) to corroborate the conclusion of GRAS for corn protein. Specifically,

these Notifications present data and information confirming that there is a history of safe consumption of the source plants and their proteins, there are no toxicologically or clinically relevant effects observed in studies where these plant proteins were fed to animals or humans, and estimated consumer intake levels for these plant proteins are consistent with established RDAs (IOM, 2002/2005) or safe consumption values (WHO, 2007) for protein [pp. 000008-000009 of GRN No. 26 (isolated wheat protein); pp. 000015-000019 of GRN No. 134 (soy protein); pp. 000083-000092 of GRN No. 609 (rice protein); pp. 000028-000036 of GRN 386 (canola protein isolate and hydrolyzed canola protein isolate); pp. 17-20, 23-34 of GRN No. 447 (potato protein isolates); pp. 000029-000042 of GRN No. 575 (oat protein), pp. 23-31 of GRN No. 581 (pea protein), pp. 000017-18, 000021-24, 000025 of GRN No. 608 (pea protein concentrate), pp. 39-59 of GRN No. 683 (canola protein isolate), pp. 27-38 of GRN 684 (mung bean protein isolate), and the Agency Response Letter to GRN 788 for pea protein concentrate (FDA, 2018)].

Cargill's corn protein is proposed for use as a source of protein and for functional uses such as thickening, water absorption, fat/oil absorption, solid fat emulsification, and gelation in a variety of foods. The per user mean and 90th percentile intake estimates for corn protein are 12.5 and 24.3 g/day (0.22 and 0.49 g/kg bw/day), respectively, for the total US population, assuming a worst-case estimate of intake for all proposed food categories at the maximum proposed use level. Therefore, the proposed uses of the corn protein will not result in an increase in the overall consumption of protein, but simply will provide an alternative source of well-characterized protein from corn for use in food. Further, the proposed uses of corn protein would contribute only a small portion of the background protein consumption in the US, or the dietary protein recommendations of the FDA and IOM.

Although potential adverse effects associated with consumption of extremely high levels of protein have been reported in the literature, the proposed food uses of corn protein are expected to result in consumption amounts well below the safe or acceptable protein

ingestion levels recommended by FDA (2016), IOM (2002/2005) and WHO (2007) (details discussed above).

Discussion of Information Inconsistent with GRAS Conclusion

Cargill is not aware of information that would be inconsistent with a finding that the proposed use of corn protein as a plant-derived source of protein is GRAS. The regulatory framework for determining whether a substance is GRAS is in 21 CFR §170.30, which states that GRAS status through scientific procedures shall ordinarily be based upon published studies, which may be corroborated by unpublished studies and other data and information. These criteria have been applied to the existing data for corn protein.

GRAS Conclusion

Consideration of the totality-of-the-evidence related to the safety evaluation of corn protein (including the historical consumption of corn and its proteins), provides a basis upon which to conclude that the uses of corn protein described in this dossier satisfy the safety standard of Reasonable Certainty of No Harm. Additionally, these data and information are known and accepted by a consensus of qualified experts in the general scientific community [Exhibit I. *Expert Panel Report*], fulfilling the requirement for common knowledge that corn protein is generally recognized as safe (GRAS) under its intended conditions of use, when produced in accordance with current GMPs and meeting the food-grade/quality specifications described above.

§ 170.250 Part 7, Supporting Data and Information

The following references are all generally available, unless otherwise noted. Appendix 1 (analytical COAs for corn protein), Appendix 2 (Consumer Intake Assessment Report for corn protein), and Exhibit I (signed Expert Panel report) are not generally available but are attached for reference.

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GRN (GRAS Notification) No. 386: canola protein isolate and hydrolyzed canola protein isolate. Filed on June 22, 2011 by BioExx Specialty Proteins, Ltd. Agency Response Letter dated December 28, 2011.

GRN (GRAS Notification) No. 447: potato protein isolates. Filed on November 5, 2012 by Solanic B.V., an AVEBE Group Company. Agency Response Letter dated July 3, 2013.

GRN (GRAS Notification) No. 575: oat protein. Filed on April 15, 2015 by Tate and Lyle. Agency Response Letter dated September 18, 2015.

GRN (GRAS Notification) No. 581: pea protein. Filed on June 18, 2015 by World Food Processing, LLC. Agency Response Letter dated March 20, 2016.

GRN (GRAS Notification) No. 608: pea protein concentrate. Filed on December 7, 2015 by Axiom Foods, Inc. and SPRIM Strategy and Intelligent Innovation. Agency Response Letter dated May 27, 2016.

GRN (GRAS Notification) No. 609: rice protein. Filed on November 16, 2015 (amended February 19, 2016) by Soni & Associates, Inc. Agency Response Letter dated June 6, 2016.

GRN (GRAS Notification) No. 683: canola protein isolate. Filed on January 10, 2017 for DSM Innovation Company. Agency Response Letter dated May 10, 2017.

GRN (GRAS Notification) No. 684: mung bean protein isolate. Filed on January 13, 2017 (amended March 7, 9, and 24, 2017) for Hampton Creek, Inc. Agency Response Letter dated August 4, 2017.

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Appendix 1. Certificates of Analysis for Corn Protein

Certificate of Analysis

Material: Corn Protein

Batch:

Production Date: 19 Dec 2018

Parameter	Result	Specification	Method / Reference
Loss on drying (%)	6.0	Maximum 8%	Mettler Toledo Moisture analyzer
Protein (% dry basis)	87.9	Minimum 65%	Leco, combustion
Ethanol (g/kg)	52.8	< 60 g/kg	Waters HPLC using size exclusion aminex hpx-87h column, along with an RI detector
Sulfur dioxide (mg/kg)	40	< 100 mg/kg	Monier-Williams distillation method using an auto pH titrator
Aerobic plate count (cfu/g)	190	< 10,000 cfu/g	AOAC 990.12
Enterobacteriaceae (cfu/g)	<10	< 10 cfu/g	AOAC 2003.01
Salmonella (cfu/25g)	Negative	Negative	AOAC 2004.03 (negative per 25 g)
Yeast (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Mold (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Heavy Metals as Pb (ppm) *	<10	<20 ppm	USP/NF 231
Lead (ppm)	0.02	<1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)
Mercury (ppm)	<0.010	< 1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)

* Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.

n.d. = None Detected

Cargill Research and Development, Sample for Research Purposes, Not for Sale. Produced in a facility that has used soy, dairy (milk), wheat, and egg.

Certificate of Analysis

Material: Corn Protein

Batch:

Production Date: 18 Dec 2018

Parameter	Result	Specification	Method / Reference
Loss on drying (%)	1.7	Maximum 8%	Mettler Toledo Moisture analyzer
Protein (% dry basis)	87.9	Minimum 65%	Leco, combustion
Ethanol (g/kg)	11.7	< 60 g/kg	Waters HPLC using size exclusion aminex hpx-87h column, along with an RI detector
Sulfur dioxide (mg/kg)	42	< 100 mg/kg	Monier-Williams distillation method using an auto pH titrator
Aerobic plate count (cfu/g)	<10	< 10,000 cfu/g	AOAC 990.12
Enterobacteriaceae (cfu/g)	<10	< 10 cfu/g	AOAC 2003.01
Salmonella (cfu/25g)	Negative	Negative	AOAC 2004.03 (negative per 25 g)
Yeast (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Mold (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Heavy Metals as Pb (ppm) *	<10	<20 ppm	USP/NF 231
Lead (ppm)	0.03	<1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)
Mercury (ppm)	<0.010	< 1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)

* Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.

n.d. = None Detected

Cargill Research and Development, Sample for Research Purposes, Not for Sale. Produced in a facility that has used soy, dairy (milk), wheat, and egg.

Cargill

Certificate of Analysis

Material: Corn Protein

Batch:

Production Date: 08 Jan 2019

Parameter	Result	Specification	Method / Reference
Loss on drying (%)	1.7	Maximum 8%	Mettler Toledo Moisture analyzer
Protein (% dry basis)	87.9	Minimum 65%	Leco, combustion
Ethanol (g/kg)	12.8	< 60 g/kg	Waters HPLC using size exclusion aminex hpx-87h column, along with an RI detector
Sulfur dioxide (mg/kg)	32	< 100 mg/kg	Monier-Williams distillation method using an auto pH titrator
Aerobic plate count (cfu/g)	<10	< 10,000 cfu/g	AOAC 990.12
Enterobacteriaceae (cfu/g)	<10	< 10 cfu/g	AOAC 2003.01
Salmonella (cfu/25g)	Negative	Negative	AOAC 2004.03 (negative per 25 g)
Yeast (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Mold (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Heavy Metals as Pb (ppm) *	<10	<20 ppm	USP/NF 231
Lead (ppm)	0.02	<1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)
Mercury (ppm)	<0.010	< 1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)

* Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.

n.d. = None Detected

Cargill Research and Development, Sample for Research Purposes, Not for Sale. Produced in a facility that has used soy, dairy (milk), wheat, and egg.

Certificate of Analysis

Material: Corn Protein

Batch:

Production Date: 07 Jan 2019

Parameter	Result	Specification	Method / Reference
Loss on drying (%)	0.9	Maximum 8%	Mettler Toledo Moisture analyzer
Protein (% dry basis)	87.9	Minimum 65%	Leco, combustion
Ethanol (g/kg)	6.0	< 60 g/kg	Waters HPLC using size exclusion aminex hpx-87h column, along with an RI detector
Sulfur dioxide (mg/kg)	45	< 100 mg/kg	Monier-Williams distillation method using an auto pH titrator
Aerobic plate count (cfu/g)	20	< 10,000 cfu/g	AOAC 990.12
Enterobacteriaceae (cfu/g)	<10	< 10 cfu/g	AOAC 2003.01
Salmonella (cfu/25g)	Negative	Negative	AOAC 2004.03 (negative per 25 g)
Yeast (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Mold (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Heavy Metals as Pb (ppm) *	<10	<20 ppm	USP/NF 231
Lead (ppm)	0.02	<1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)
Mercury (ppm)	<0.010	< 1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)

* Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.

n.d. = None Detected

Cargill Research and Development, Sample for Research Purposes, Not for Sale. Produced in a facility that has used soy, dairy (milk), wheat, and egg.

Certificate of Analysis

Material: Corn Protein

Batch:

Production Date: 04 Jan 2019

Parameter	Result	Specification	Method / Reference
Loss on drying (%)	1.6	Maximum 8%	Mettler Toledo Moisture analyzer
Protein (% dry basis)	88.1	Minimum 65%	Leco, combustion
Ethanol (g/kg)	12.6	< 60 g/kg	Waters HPLC using size exclusion aminex hpx-87h column, along with an RI detector
Sulfur dioxide (mg/kg)	42	< 100 mg/kg	Monier-Williams distillation method using an auto pH titrator
Aerobic plate count (cfu/g)	<10	< 10,000 cfu/g	AOAC 990.12
Enterobacteriaceae (cfu/g)	<10	< 10 cfu/g	AOAC 2003.01
Salmonella (cfu/25g)	Negative	Negative	AOAC 2004.03 (negative per 25 g)
Yeast (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Mold (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Heavy Metals as Pb (ppm) *	<10	<20 ppm	USP/NF 231
Lead (ppm)	0.02	<1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)
Mercury (ppm)	<0.010	< 1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)

* Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.

n.d. = None Detected

Cargill Research and Development, Sample for Research Purposes, Not for Sale. Produced in a facility that has used soy, dairy (milk), wheat, and egg.

Certificate of Analysis

Material: Corn Protein

Batch:

Production Date: 03 Jan 2019

Parameter	Result	Specification	Method / Reference
Loss on drying (%)	1.0	Maximum 8%	Mettler Toledo Moisture analyzer
Protein (% dry basis)	87.9	Minimum 65%	Leco, combustion
Ethanol (g/kg)	7.6	< 60 g/kg	Waters HPLC using size exclusion aminex hpx-87h column, along with an RI detector
Sulfur dioxide (mg/kg)	41	< 100 mg/kg	Monier-Williams distillation method using an auto pH titrator
Aerobic plate count (cfu/g)	7300	< 10,000 cfu/g	AOAC 990.12
Enterobacteriaceae (cfu/g)	<10	< 10 cfu/g	AOAC 2003.01
Salmonella (cfu/25g)	Negative	Negative	AOAC 2004.03 (negative per 25 g)
Yeast (cfu/g)	<10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Mold (cfu/g)	10	< 5,000 cfu/g	FDA-BAM 7th Ed.
Heavy Metals as Pb (ppm) *	<10	<20 ppm	USP/NF 231
Lead (ppm)	0.02	<1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)
Mercury (ppm)	<0.010	< 1 ppm	J. AOAC vol. 90 (2007) 844-856 (mod)

* Heavy metals screen according to USP Method 231; includes qualitative test for lead, mercury, arsenic, cadmium, bismuth, antimony, tin, silver, copper, and molybdenum.

n.d. = None Detected

Cargill Research and Development, Sample for Research Purposes, Not for Sale. Produced in a facility that has used soy, dairy (milk), wheat, and egg.

Appendix 2. Pesticide Screening Methodology and Analytes

Tests and packages

PQA0E-1 Pesticides- Quechers for Fruits and Vegetables

Applied on Most fruits and vegetables

Time 8 days

Quantity of sample Optimal 1000 g Minimal 200 g

Content - Pesticides Quechers GC-MSMS [QA01P-1*] AOAC 2007.01

Acephate(LOQ 0.01mg/kg); Acetochlor(LOQ 0.01mg/kg); Aclonifen(LOQ 0.01mg/kg); Acrinathrin(LOQ 0.01mg/kg); Aldrin(LOQ 0.01mg/kg); Allethrin(LOQ 0.05mg/kg); Ametryn(LOQ 0.01mg/kg); Atrazine(LOQ 0.01mg/kg); Azaconazole(LOQ 0.01mg/kg); Captan(LOQ 0.02mg/kg); Azinphos-ethyl (Ethyl Guthion)(LOQ 0.01mg/kg); Azinphos-methyl(LOQ 0.01mg/kg); Benalaxyl(LOQ 0.01mg/kg); Benfluralin(LOQ 0.01mg/kg); Bifenox(LOQ 0.01mg/kg); Bifenthrin(LOQ 0.01mg/kg); Bromacil(LOQ 0.01mg/kg); Bromocyclen(LOQ 0.01mg/kg); Bromophos(LOQ 0.01mg/kg); Bromophos-ethyl(LOQ 0.01mg/kg); Bromopropylate(LOQ 0.01mg/kg); Butachlor(LOQ 0.01mg/kg); Butafenacil(LOQ 0.01mg/kg); Butylate(LOQ 0.01mg/kg); Cadusaphos(LOQ 0.01mg/kg); Captafol(LOQ 0.02mg/kg); Carbetamide(LOQ 0.01mg/kg); Carbophenothion(LOQ 0.01mg/kg); Carbophenothion-methyl(LOQ 0.01mg/kg); Chlordane, cis-(LOQ 0.01mg/kg); Chlordane, oxy-(LOQ 0.01mg/kg); Chlordane, trans-(LOQ 0.01mg/kg); Chlordene, beta(LOQ 0.01mg/kg); Chlordene, gamma-(LOQ 0.01mg/kg); Chlordimeform(LOQ 0.01mg/kg); Chlorethoxyfos(LOQ 0.01mg/kg); Chlorfenapyr(LOQ 0.01mg/kg); Chlorfenson(LOQ 0.01mg/kg); Chlorobenzilate(LOQ 0.01mg/kg); Chloroneb(LOQ 0.01mg/kg); Chloropropylate(LOQ 0.01mg/kg); Chlorothalonil(LOQ 0.01mg/kg); Chlorpropham (CIPC)(LOQ 0.01mg/kg); Chlorpyrifos(LOQ 0.01mg/kg); Chlorpyrifos-methyl(LOQ 0.01mg/kg); Chlorthal-dimethyl(LOQ 0.01mg/kg); Chlorthiofos(LOQ 0.01mg/kg); Chlorthion(LOQ 0.01mg/kg); Chlozolinate(LOQ 0.01mg/kg); Coumaphos(LOQ 0.01mg/kg); Cloquintocet-mexyl(LOQ 0.01mg/kg); Crimidine(LOQ 0.01mg/kg); Crotoxyphos(LOQ 0.01mg/kg); Cyanazine(LOQ 0.05mg/kg); Cyanofenphos(LOQ 0.01mg/kg); Cyanophos(LOQ 0.05mg/kg); Cyfluthrin(LOQ 0.01mg/kg); Cyhalofop-butyl(LOQ 0.01mg/kg); Endrin(LOQ 0.01mg/kg); Cyhalothrin lambda-(LOQ 0.01mg/kg); Cypermethrin(LOQ 0.01mg/kg); Dacthal (DCPA)(LOQ 0.01mg/kg); DDD, o,p'-(LOQ 0.01mg/kg); DDD, p,p'-(LOQ 0.01mg/kg); DDE, o,p'-(LOQ 0.01mg/kg); DDE, p,p'-(LOQ 0.01mg/kg); DDT, o,p'-(LOQ 0.01mg/kg); EPN(LOQ 0.01mg/kg); DDT, p,p'-(LOQ 0.01mg/kg); DEF (Butifos)(LOQ 0.01mg/kg); Deltamethrin(LOQ 0.01mg/kg); Demeton-O(LOQ 0.01mg/kg); Demeton-S(LOQ 0.01mg/kg); Demeton-S-methyl(LOQ 0.01mg/kg); Dialifos(LOQ 0.01mg/kg); Diallate(LOQ 0.01mg/kg); Dichlobenil(LOQ 0.01mg/kg); Diazinon (O Analog)(LOQ 0.01mg/kg); Dichlofenthion(LOQ 0.01mg/kg); Dichlofluanid(LOQ 0.01mg/kg); Dichlone(LOQ 0.05mg/kg); Dichlorvos(LOQ 0.01mg/kg); Diclobutrazol(LOQ 0.01mg/kg); Dicloran(LOQ 0.01mg/kg); Dicofol, p,p-(LOQ 0.01mg/kg); Dicrotophos(LOQ 0.01mg/kg); Dieldrin(LOQ 0.01mg/kg); Diflufenican(LOQ 0.01mg/kg); Dimethachlor(LOQ 0.01mg/kg); Dimethenamid(LOQ 0.01mg/kg); Dimoxystrobin(LOQ 0.01mg/kg); Dioxathion(LOQ 0.01mg/kg); Diphenamid(LOQ 0.01mg/kg); Diphenyl(LOQ 0.01mg/kg); Diphenylamine(LOQ 0.01mg/kg); Dipropetryn(LOQ 0.01mg/kg); Disulfoton(LOQ 0.01mg/kg); Disulfoton-PS-sulfone(LOQ 0.01mg/kg); Endosulfan I (alpha-endosulfan)(LOQ 0.01mg/kg); Endosulfan II (beta-Endosulfan)(LOQ 0.01mg/kg); Endrin ketone(LOQ 0.01mg/kg); Endosulfan sulphate(LOQ 0.01mg/kg); Endrin-aldehyde(LOQ 0.01mg/kg); EPTC(LOQ 0.01mg/kg); Esfenvalerate(LOQ 0.01mg/kg); Ethalfluralin(LOQ 0.01mg/kg); Ethion(LOQ 0.01mg/kg); Ethoprophos(LOQ 0.01mg/kg); Ethoxyquin(LOQ 0.01mg/kg); Etoxazole(LOQ 0.01mg/kg); Etridiazole(LOQ 0.01mg/kg); Etrimfos(LOQ 0.01mg/kg); Famophos(LOQ 0.01mg/kg); Famoxadone(LOQ 0.01mg/kg); Fenamidone(LOQ 0.01mg/kg); Fenchlorphos(LOQ 0.01mg/kg); Fenfluthrin(LOQ 0.01mg/kg); Fenitrothion(LOQ 0.01mg/kg); Fenoxaprop-p-ethyl(LOQ 0.01mg/kg); Fenpropathrin(LOQ 0.01mg/kg); Fenson(LOQ 0.01mg/kg); Fensulfothion(LOQ 0.01mg/kg); Fenthion(LOQ 0.01mg/kg); Fenvalerate(LOQ 0.01mg/kg); Fluazifop-P-butyl(LOQ 0.01mg/kg); Fluchloralin(LOQ 0.01mg/kg); Flucythrinate(LOQ 0.01mg/kg); Folpet(LOQ 0.01mg/kg); Fluensulfone(LOQ 0.01mg/kg); Flumioxazin(LOQ 0.01mg/kg); Fluotrimazole(LOQ 0.01mg/kg); Fluquinconazole(LOQ 0.01mg/kg); Flutolanil(LOQ 0.01mg/kg); Flutriafol(LOQ 0.01mg/kg); Fluvalinate(LOQ 0.01mg/kg);

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Fonofos(LOQ 0.01mg/kg); Halfenprox(LOQ 0.01mg/kg); Gamma-cyhalothrin(LOQ 0.01mg/kg); gamma-HCH (Lindane)(LOQ 0.01mg/kg); HCH, alpha-(LOQ 0.01mg/kg); HCH, beta-(LOQ 0.01mg/kg); HCH, delta-(LOQ 0.01mg/kg); Heptachlor(LOQ 0.01mg/kg); Heptachlor Epoxide (cis, trans)(LOQ 0.01mg/kg); Isodrin(LOQ 0.01mg/kg); Hexachlorobenzene (HCB)(LOQ 0.01mg/kg); Hexazinone(LOQ 0.01mg/kg); Iprobenfos(LOQ 0.01mg/kg); Iprodione(LOQ 0.01mg/kg); Isazophos(LOQ 0.01mg/kg); Isocarbamid(LOQ 0.01mg/kg); Isocarbofos(LOQ 0.01mg/kg); Isofenphos-methyl(LOQ 0.01mg/kg); Isopropalin(LOQ 0.01mg/kg); Isoprothiolane(LOQ 0.01mg/kg); Isoxadifen-ethyl(LOQ 0.01mg/kg); Lenacil(LOQ 0.01mg/kg); Leptophos(LOQ 0.01mg/kg); Malathion(LOQ 0.01mg/kg); Mefenpyr-diethyl(LOQ 0.01mg/kg); Mepronil(LOQ 0.01mg/kg); Mevinphos(LOQ 0.01mg/kg); Metazachlor(LOQ 0.01mg/kg); Methacriphos(LOQ 0.01mg/kg); Methamidophos(LOQ 0.01mg/kg); Methoprothryn(LOQ 0.01mg/kg); Methoxychlor, o,o'(LOQ 0.01mg/kg); Methoxychlor, p,p'(LOQ 0.01mg/kg); Mexacarbate(LOQ 0.01mg/kg); MGK-264(LOQ 0.01mg/kg); Mirex(LOQ 0.01mg/kg); Monocrotophos(LOQ 0.01mg/kg); Naproanilide(LOQ 0.01mg/kg); Napropamide(LOQ 0.01mg/kg); Nitralin(LOQ 0.01mg/kg); Nitrapyrin(LOQ 0.01mg/kg); Nitrofen(LOQ 0.01mg/kg); Nitrothal-isopropyl(LOQ 0.01mg/kg); Norea(LOQ 0.01mg/kg); Nonachlor, cis-(LOQ 0.01mg/kg); Nonachlor, trans-(LOQ 0.01mg/kg); Norflurazon(LOQ 0.01mg/kg); Ofurace(LOQ 0.01mg/kg); Omethoate(LOQ 0.01mg/kg); o-Phenylphenol(LOQ 0.01mg/kg); Oxyfluorfen(LOQ 0.01mg/kg); Paclobutrazol(LOQ 0.01mg/kg); Parathion(LOQ 0.01mg/kg); Parathion oxygen analog(LOQ 0.01mg/kg); Parathion-methyl(LOQ 0.01mg/kg); Parathion-methyl oxygen analog(LOQ 0.01mg/kg); PCB 101(LOQ 0.01mg/kg); PCB 138(LOQ 0.01mg/kg); PCB 153(LOQ 0.01mg/kg); PCB 180(LOQ 0.01mg/kg); PCB 28(LOQ 0.01mg/kg); PCB 52(LOQ 0.01mg/kg); Pebulate(LOQ 0.01mg/kg); Pentachloranisole(LOQ 0.01mg/kg); Pentachloroaniline(LOQ 0.01mg/kg); Pentachlorobenzene(LOQ 0.01mg/kg); Pentachlorobenzonitrile(LOQ 0.01mg/kg); Penthiopyrad(LOQ 0.01mg/kg); Pentachlorothioanisole(LOQ 0.01mg/kg); Permethrin(LOQ 0.01mg/kg); Perthane(LOQ 0.01mg/kg); Phenothrin(LOQ 0.01mg/kg); Phenthoate(LOQ 0.01mg/kg); Phorate(LOQ 0.01mg/kg); Phorate-O-analogue(LOQ 0.01mg/kg); Phorate-sulfone(LOQ 0.01mg/kg); Phosmet(LOQ 0.01mg/kg); Phosphamidon(LOQ 0.01mg/kg); Picolinafen(LOQ 0.01mg/kg); Picoxystrobin(LOQ 0.01mg/kg); Procymidone(LOQ 0.01mg/kg); Profenofos(LOQ 0.01mg/kg); Profluralin(LOQ 0.01mg/kg); Prometryn(LOQ 0.01mg/kg); Propachlor(LOQ 0.01mg/kg)

; Propamocarb(LOQ 0.01mg/kg); Propazine(LOQ 0.01mg/kg); Propetamphos(LOQ 0.01mg/kg); Propyzamide(LOQ 0.01mg/kg); Prothiofos(LOQ 0.01mg/kg); Pyrazophos(LOQ 0.01mg/kg); Pyridalyl(LOQ 0.01mg/kg); Pyrifenox(LOQ 0.01mg/kg); Quinalphos(LOQ 0.01mg/kg); Quinomethionate (Morestan)(LOQ 0.01mg/kg); Quintozene(LOQ 0.01mg/kg); Quizalofop-P-ethyl(LOQ 0.01mg/kg); S 421 (Octachlordipropylether)(LOQ 0.01mg/kg); Secbumeton(LOQ 0.01mg/kg); Silaneophan(LOQ 0.01mg/kg); Silthiofam(LOQ 0.01mg/kg); Simazine(LOQ 0.01mg/kg); Tebupirimfos(LOQ 0.01mg/kg); Tecnazene(LOQ 0.01mg/kg); Tefluthrin(LOQ 0.01mg/kg); Terbacil(LOQ 0.01mg/kg); Terbuthylazine(LOQ 0.01mg/kg); Tetradifon(LOQ 0.01mg/kg); Tetrahydrophthalimide (THPI)(LOQ 0.01mg/kg); Tetramethrin(LOQ 0.01mg/kg); Tetrasul(LOQ 0.01mg/kg); Thiometon(LOQ 0.01mg/kg); Thionazin(LOQ 0.01mg/kg); Tolclofos-methyl(LOQ 0.01mg/kg); Tolylfluanid(LOQ 0.01mg/kg); Tralomethrin(LOQ 0.01mg/kg); Transfluthrin(LOQ 0.01mg/kg); Screened pesticides; Triazophos(LOQ 0.01mg/kg); Trichlorfon(LOQ 0.01mg/kg); Trichloronat(LOQ 0.01mg/kg); Trifluralin(LOQ 0.01mg/kg); Triticonazole(LOQ 0.01mg/kg); Vinclozolin(LOQ 0.01mg/kg); Tetrachloroaniline, 2,3,4,6-(LOQ 0.01mg/kg); Other screened pesticides

- Pesticides Quechers-LC-MS/MS [QA01R-1*] AOAC 2007.01

1-Naphthol(LOQ 0.01mg/kg); 2,4-D(LOQ 0.01mg/kg); 3-Hydroxycarbofuran(LOQ 0.01mg/kg); 3-ketocarbofuran(LOQ 0.01mg/kg); Abamectin(LOQ 0.01mg/kg); Acetamiprid(LOQ 0.01mg/kg); Acibenzolar-s-methyl(LOQ 0.01mg/kg); Alachlor(LOQ 0.01mg/kg); Screened pesticides; Aldicarb(LOQ 0.01mg/kg); Aldicarb-sulfone(LOQ 0.01mg/kg); Aldicarb-sulfoxide(LOQ 0.01mg/kg); Aminocarb(LOQ 0.01mg/kg); Amitraz(LOQ 0.01mg/kg); Azadirachtin(LOQ 0.01mg/kg); Azinphos-methyl oxon(LOQ 0.01mg/kg); Azoxystrobin(LOQ 0.01mg/kg); Bendiocarb(LOQ 0.01mg/kg); Benfuracarb(LOQ 0.01mg/kg); Bensulide(LOQ 0.01mg/kg); Bifenazate(LOQ 0.01mg/kg); Bitertanol(LOQ 0.01mg/kg); Boscalid(LOQ 0.01mg/kg); Bromuconazole(LOQ 0.01mg/kg); Bupirimate(LOQ 0.01mg/kg); Buprofezin(LOQ 0.01mg/kg); Butocarboxim-sulfoxide(LOQ 0.05mg/kg); Carbaryl(LOQ 0.01mg/kg); Carbendazim(LOQ 0.01mg/kg); Carbofuran(LOQ 0.01mg/kg); Carbofuran (Phenol)(LOQ 0.01mg/kg); Carbosulfan(LOQ 0.01mg/kg); Carboxin(LOQ 0.01mg/kg); Carfentrazone-ethyl(LOQ 0.01mg/kg); Chlorantraniliprole(LOQ 0.01mg/kg); Chlorfenvinphos(LOQ 0.01mg/kg); Chloridazone(LOQ 0.01mg/kg); Chloroxuron(LOQ 0.01mg/kg); Clethodim(LOQ 0.01mg/kg); Climbazole(LOQ 0.01mg/kg); Clodinafop-propargyl(LOQ 0.01mg/kg); Clofentezine(LOQ 0.01mg/kg); Clomazone(LOQ 0.01mg/kg); Clothianidin(LOQ 0.01mg/kg); Cyantraniliprole(LOQ 0.01mg/kg); Cyazofamid(LOQ 0.01mg/kg); Cycloate(LOQ 0.01mg/kg); Cycloxydim(LOQ 0.01mg/kg); Cymoxanil(LOQ 0.01mg/kg); Cyproconazole(LOQ 0.01mg/kg); Cyprodinil(LOQ 0.01mg/kg);

Cyromazine(LOQ 0.05mg/kg); Demeton-S-methyl-sulfone(LOQ 0.01mg/kg); Demeton-S-sulfone(LOQ 0.01mg/kg); Desmedipham(LOQ 0.01mg/kg); Desmetryn(LOQ 0.01mg/kg); Diafenthiuron(LOQ 0.01mg/kg); Diazinon(LOQ 0.01mg/kg); Diethofencarb(LOQ 0.01mg/kg); Difenoconazole(LOQ 0.01mg/kg); Diflubenzuron(LOQ 0.01mg/kg); Dimethametryn(LOQ 0.01mg/kg); Dimethoate(LOQ 0.01mg/kg); Dimethomorph(LOQ 0.01mg/kg); Dimethylvinphos(LOQ 0.01mg/kg); Diniconazole(LOQ 0.01mg/kg); Dioxacarb(LOQ 0.01mg/kg); Diuron(LOQ 0.01mg/kg); Dodine(LOQ 0.01mg/kg); Edifenphos(LOQ 0.01mg/kg); Epoxiconazole(LOQ 0.01mg/kg); Etaconazole(LOQ 0.01mg/kg); Ethiofencarb(LOQ 0.01mg/kg); Ethiofencarb-sulfone(LOQ 0.01mg/kg); Ethiofencarb-sulfoxide(LOQ 0.01mg/kg); Ethofumesate(LOQ 0.01mg/kg); Etobenzanid(LOQ 0.01mg/kg); Etofenprox(LOQ 0.01mg/kg); Fenamiphos(LOQ 0.01mg/kg); Fenarimol(LOQ 0.02mg/kg); Fenazaquin(LOQ 0.01mg/kg); Fenbuconazole(LOQ 0.01mg/kg); Fenhexamid(LOQ 0.01mg/kg); Fenobucarb(LOQ 0.01mg/kg); Fenoxycarb(LOQ 0.01mg/kg); Fenpropimorph(LOQ 0.01mg/kg); Fenpyroximate(LOQ 0.01mg/kg); Fipronil(LOQ 0.005mg/kg); Flonicamid(LOQ 0.01mg/kg); Fludioxonil(LOQ 0.01mg/kg); Flufenacet(LOQ 0.01mg/kg); Flufenoxuron(LOQ 0.01mg/kg); Fluopicolide(LOQ 0.01mg/kg); Fluopyram(LOQ 0.01mg/kg); Flupyradifurone(LOQ 0.01mg/kg); Flusilazole(LOQ 0.01mg/kg); Fluthiacet-methyl(LOQ 0.01mg/kg); Fluxapyroxad(LOQ 0.01mg/kg); Forchlorfenuron(LOQ 0.01mg/kg); Fosthiazate(LOQ 0.01mg/kg); Furalaxyl(LOQ 0.01mg/kg); Furathiocarb(LOQ 0.01mg/kg); Heptenophos(LOQ 0.01mg/kg); Hexaconazole(LOQ 0.01mg/kg); Hexaflumuron(LOQ 0.01mg/kg); Hexythiazox(LOQ 0.01mg/kg); Imazalil(LOQ 0.01mg/kg); Imidacloprid(LOQ 0.01mg/kg); Indoxacarb(LOQ 0.01mg/kg); Iprovalicarb(LOQ 0.01mg/kg); Isofenphos(LOQ 0.01mg/kg); Isoprocarb(LOQ 0.01mg/kg); Isoproturon(LOQ 0.01mg/kg); Isoxaben(LOQ 0.01mg/kg); Isoxaflutole(LOQ 0.01mg/kg); Kresoxim-methyl(LOQ 0.01mg/kg); Linuron(LOQ 0.01mg/kg); Lufenuron(LOQ 0.01mg/kg); Malaoxon(LOQ 0.01mg/kg); Mecarbam(LOQ 0.01mg/kg); Mepanipyrim(LOQ 0.01mg/kg); Metalaxyl and Metalaxyl-M (sum)(LOQ 0.01mg/kg); Metamitron(LOQ 0.05mg/kg); Methabenztiazuron(LOQ 0.01mg/kg); Methidathion(LOQ 0.01mg/kg); Methiocarb(LOQ 0.01mg/kg); Methiocarb-sulfone(LOQ 0.01mg/kg); Methiocarb sulfoxide(LOQ 0.01mg/kg); Methomyl(LOQ 0.01mg/kg); Methoxyfenozide(LOQ 0.01mg/kg); Metolachlor(LOQ 0.01mg/kg); Metolcarb(LOQ 0.01mg/kg); Metoxuron(LOQ 0.01mg/kg); Metribuzin(LOQ 0.01mg/kg); Molinate(LOQ 0.01mg/kg); Naled(LOQ 0.01mg/kg); Monolinuron(LOQ 0.01mg/kg); Myclobutanil(LOQ 0.01mg/kg); Naphthalene Acetamide(LOQ 0.01mg/kg); Neburon(LOQ 0.01mg/kg); Nitenpyram(LOQ 0.05mg/kg); Novaluron(LOQ 0.01mg/kg); Nuarimol(LOQ 0.01mg/kg); Oxadiazon(LOQ 0.01mg/kg); Oxadixyl(LOQ 0.01mg/kg); Oxamyl(LOQ 0.01mg/kg); Oxydemeton-methyl(LOQ 0.01mg/kg); Penconazole(LOQ 0.01mg/kg); Pencycuron(LOQ 0.01mg/kg); Pendimethalin(LOQ 0.01mg/kg); Phenkapton(LOQ 0.01mg/kg); Phenmedipham(LOQ 0.01mg/kg); Phorate-sulfoxide(LOQ 0.01mg/kg); Phosalone(LOQ 0.01mg/kg); Piperonyl butoxide (PBO)(LOQ 0.01mg/kg); Pirimicarb(LOQ 0.01mg/kg); Pirimicarb, desmethyl-(LOQ 0.01mg/kg); Pirimicarb, desmethyl-formamido-(LOQ 0.01mg/kg); Pirimiphos-ethyl(LOQ 0.01mg/kg); Pirimiphos-methyl(LOQ 0.01mg/kg); Prochloraz(LOQ 0.01mg/kg); Profoxydim(LOQ 0.01mg/kg); Promecarb(LOQ 0.01mg/kg); Prometon(LOQ 0.01mg/kg); Propanil(LOQ 0.01mg/kg); Propaquizafop(LOQ 0.01mg/kg); Propargite(LOQ 0.02mg/kg); Propham(LOQ 0.05mg/kg); Propiconazole(LOQ 0.01mg/kg); Propoxur(LOQ 0.01mg/kg); Proquinazid(LOQ 0.01mg/kg); Prosulfocarb(LOQ 0.01mg/kg); Pymetrozine(LOQ 0.02mg/kg); Pyraclostrobin(LOQ 0.01mg/kg); Pyridaben(LOQ 0.01mg/kg); Pyridaphenthion(LOQ 0.01mg/kg); Pyridate(LOQ 0.01mg/kg); Pyrimethanil(LOQ 0.01mg/kg); Pyriproxyfen(LOQ 0.01mg/kg); Quinoxyfen(LOQ 0.01mg/kg); Rimsulfuron(LOQ 0.01mg/kg); Rotenone(LOQ 0.01mg/kg); Sethoxydim(LOQ 0.01mg/kg); Simetryn(LOQ 0.01mg/kg); Spinetoram(LOQ 0.01mg/kg); Spinosad(LOQ 0.01mg/kg); Spirodiclofen(LOQ 0.01mg/kg); Spiromesifen(LOQ 0.01mg/kg); Spirotetramat(LOQ 0.01mg/kg); Spiroxamine(LOQ 0.01mg/kg); Sulfotep(LOQ 0.01mg/kg); Sulprofos(LOQ 0.01mg/kg); Tebuconazole(LOQ 0.01mg/kg); Tebufenozide(LOQ 0.01mg/kg); Tebufenpyrad(LOQ 0.01mg/kg); Tebuthiuron(LOQ 0.01mg/kg); Teflubenzuron(LOQ 0.01mg/kg); Tepraloxydim(LOQ 0.01mg/kg); Terbufos(LOQ 0.01mg/kg); Terbumeton(LOQ 0.01mg/kg); Terbutryn(LOQ 0.01mg/kg); Tetrachlorvinphos(LOQ 0.01mg/kg); Tetraconazole(LOQ 0.01mg/kg); Thiabendazole(LOQ 0.01mg/kg); Thiacloprid(LOQ 0.01mg/kg); Thiamethoxam(LOQ 0.01mg/kg); Thiobencarb(LOQ 0.01mg/kg); Thiodicarb(LOQ 0.01mg/kg); Thiofanox-sulfoxide(LOQ 0.01mg/kg); Thiophanate-methyl(LOQ 0.01mg/kg); Tolfenpyrad(LOQ 0.01mg/kg); Tralkoxydim(LOQ 0.01mg/kg); Triadimefon(LOQ 0.01mg/kg); Triadimenol(LOQ 0.01mg/kg); Triallate(LOQ 0.01mg/kg); Triazamate(LOQ 0.01mg/kg); Tricyclazole(LOQ 0.01mg/kg); Tridemorph(LOQ 0.01mg/kg); Trifloxystrobin(LOQ 0.01mg/kg); Triflumizole(LOQ 0.01mg/kg); Triforine(LOQ 0.01mg/kg)

; Triflumuron(LOQ 0.01mg/kg); Trimethacarb 2.3.5-(LOQ 0.01mg/kg); Trimethycarb, 3,4,5-(LOQ 0.01mg/kg); Uniconazole-P(LOQ 0.01mg/kg); Other screened pesticides

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LOQ: Limit of Quantification *LOD: Limit of detection*

(The * sign indicates the test is accredited) (¤:The accreditation status of the test depends on the type of sample.)(∞:The accreditation status of the test depends on the regulation area.) (The § sign indicates the test is not accredited for all parameters)

Eurofins Scientific Inc.
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Package Test Code	Package Name	Test Code	Pesticide Parameter	LOQ	Numerator	Denominator	Method Reference
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cadusaphos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Acrinathrin	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tralomethrin	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chloropropylate	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	S 421 (Octachlordipropylether)	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Endrin-aldehyde	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Endrin ketone	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Nonachlor, trans-	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Acetochlor	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dimethenamid	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Carbetamide	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Secbumeton	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pentachlorothioanisole	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorethoxyfos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cyhalofop-butyl	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Naproanilide	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phorate-O-analogue	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Nonachlor, cis-	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	PCB 28	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	PCB 52	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	PCB 153	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlordane, oxy-	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenfluthrin	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Flucythrinate	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Carbophenothion-methyl	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Famophos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Iprobenfos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Prometryn	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Propachlor	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Propazine	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Propetamphos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Prothiofos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pyrazophos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Quinalphos	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Quintozene	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fluvalinate	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tecnazene	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Terbuthylazine	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tetradifon	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tetramethrin	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tetrasul	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Thiometon	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tolclofos-methyl	0.01	kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tolylfluanid	0.01	kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Triazophos		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Trichlorfon		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Trichloronat		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Trifluralin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Vinclozolin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Allethrin		0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Carbophenothion		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorobenzilate		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorthiofos		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dialifos		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dimethachlor		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dioxathion		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Endosulfan sulphate		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DDD, o,p'-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DDE, o,p'-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DDT, o,p'-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DDD, p,p'-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DDE, p,p'-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DDT, p,p'-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Perthane		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Clethodim		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Profoxydim		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Desmedipham		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Propaquizafop		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methoxyfenozide		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tepraloxydim		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiofanox-sulfoxide		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Spinetoram		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Flonicamid		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Naphthalene Acetamide		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Etobenzanid		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Azinphos-methyl oxon		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carbofuran (Phenol)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	1-Naphthol		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Nitenpyram		0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cyazofamid		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fluopyram		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fluxapyroxad		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cyantraniliprole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Flupyradifurone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Screened pesticides	-1	No unit	No unit	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pirimicarb, desmethyl-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Etofenprox		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Dodine		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Rotenone		0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenpyroximate		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Bromuconazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Clodinafop-propargyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pyriproxyfen		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Quinoxyfen		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Terbumeton		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Indoxacarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Hexaflumuron		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Flufenoxuron		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Lufenuron		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiobencarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Other screened pesticides	-1	No unit	No unit	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Spirotetramat		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Chlorantraniliprole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Azoxystrobin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Buprofezin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carbosulfan		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Chloridazone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Climbazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Clomazone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cycloate		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Diazinon		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Diethofencarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Etaconazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenazaquin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Furathiocarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Iprovalicarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Isoprocarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Metribuzin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Myclobutanil		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pirimiphos-methyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Prochloraz		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Prosulfocarb		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pyridaben		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pyrimethanil		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tebufenpyrad		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiabendazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triflumizole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenhexamid		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Azaconazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isoprothiolane		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Butachlor		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isocarbofos		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Picolinafen		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Halfenprox		0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Transfluthrin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Butafenacil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dimoxystrobin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Flumioxazin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isoxadifen-ethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pyridalyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Silaneophan	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Silthiofam	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Mepronil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Penthiopyrad	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Hexachlorobenzene (HCB)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	gamma-HCH (Lindane)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dieldrin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Mirex	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Parathion-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Parathion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorpyrifos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Acephate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	HCH, alpha-	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Azinphos-ethyl (Ethyl Guthion)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Benfluralin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	HCH, beta-	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bromocyclen	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bromophos-ethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bromophos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bromopropylate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Captafol	0.02 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Captan	0.02 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlordimeform	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorfenson	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chloroneb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Quizalofop-P-ethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorothalonil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Acetamiprid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Spinosad	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiamethoxam	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Rimsulfuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Prometon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Diflubenzuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Dimethomorph	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Benfuracarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tridemorph	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	3-Hydroxycarbofuran	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Aldicarb-sulfone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Aldicarb-sulfoxide	0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methiocarb-sulfone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methiocarb sulfoxide	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Oxamyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiodicarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Isoxaben	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Imidacloprid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Demeton-S-sulfone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tebuthiuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Uniconazole-P	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Nuarimol	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cyprodinil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Diniconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Epoxiconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fludioxonil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Hexythiazox	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tetraconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Azadirachtin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Dimethylvinphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fluopicolide	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pirimicarb, desmethyl-formamido-	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fluthiacet-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Forchlorfenuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Metolcarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Proquinazid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Spirodiclofen	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tralkoxydim	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Ethiofencarb-sulfone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Ethiofencarb-sulfoxide	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tolfenpyrad	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Teflubenzuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triflumuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cyromazine	0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Chloroxuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Metamitron	0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pyridaphenthion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Oxydemeton-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Ethofumesate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Oxadixyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Penconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pendimethalin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Phosalone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Piperonyl butoxide (PBO)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pirimicarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pirimiphos-ethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Promecarb	0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Propham	0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Propiconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Propoxur	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Sulfotep	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Sulprofos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tebuconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tebufenozide	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Terbutryn	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triadimefon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triadimenol	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triallate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triforine	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cycloxydim	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Furalaxyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenamiphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Desmetryn	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Clofentezine	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenpropimorph	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Dimethametryn	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Isoproturon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Kresoxim-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Malaoxon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Metoxuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Naled	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Neburon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Phenkapton	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pyridate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Terbufos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenbuconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenoxycarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Propargite	0.02 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tetrachlorvinphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Alachlor	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Bitertanol	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carboxin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Edifenphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Demeton-S-methyl-sulfone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Simetryn	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Molinate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Phenmedipham	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	3-ketocarbofuran	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenobucarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Triazamate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Boscalid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Spiromesifen	0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Tricyclazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Imazalil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Novaluron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Clothianidin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fipronil	0.005 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Acibenzolar-s-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pyraclostrobin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carbendazim	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Diafenthiuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Bifenazate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Sethoxydim	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	2,4-D	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Abamectin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Aldicarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Aminocarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Amitraz	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Bendiocarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Bupirimate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carbaryl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carbofuran	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Chlorfenvinphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cymoxanil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Cyproconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Difenoconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Dimethoate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Dioxacarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Diuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Ethiofencarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fenarimol	0.02 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Flusilazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Heptenophos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Hexaconazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Isofenphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Linuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Mecarbam	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methabenztiazuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Metalaxyl and Metalaxyl-M (sum)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methidathion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methiocarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Methomyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Metolachlor	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Monolinuron	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Oxadiazon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Permethrin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Procymidone	0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pyrifenox		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Terbacil		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Crimidine		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenamidone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tetrachloroaniline, 2,3,4,6-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Methoxychlor, o,o'		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Methoxychlor, p,p'		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Mexacarbate		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Gamma-cyhalothrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Norea		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pentachlorobenzonitrile		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlordene, beta		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlordene, gamma-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dacthal (DCPA)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	DEF (Butifos)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diazinon (O Analog)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Quinomethionate (Morestan)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Heptachlor Epoxide (cis, trans)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	MGK-264		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tebupirimfos		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phenothrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isofenphos-methyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Screened pesticides	-1	No unit	No unit	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fluensulfone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pencycuron		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiophanate-methyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Flufenacet		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Isoxaflutole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Propanil		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Pymetrozine		0.02 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Trifloxystrobin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Bensulide		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Spiroxamine		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Phorate-sulfoxide		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Trimethacarb 2.3.5-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Trimethycarb, 3,4,5-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Butocarboxim-sulfoxide		0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Fosthiazate		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Thiacloprid		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Mepanipyrim		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01R-1	Carfentrazone-ethyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Disulfoton-PS-sulfone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phorate-sulfone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlordane, cis-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlordane, trans-		0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diphenyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dichlone		0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorfenapyr		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diflufenican		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cyhalothrin lambda-		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Famoxadone		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Heptachlor		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Flutolanil		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Other screened pesticides	-1	No unit	No unit	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	PCB 101		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	PCB 138		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	PCB 180		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Ofurace		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Aclonifen		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Aldrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Ametryn		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Atrazine		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Azinphos-methyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Benalaxyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bifenox		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bifenthrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Bromacil		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cyfluthrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cypermethrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tetrahydrophthalimide (THPI)		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diphenylamine		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dipropetryn		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Endrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	EPN		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Ethion		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Etoxazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenpropathrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fluazifop-P-butyl		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fluotrimazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fluquinconazole		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Folpet		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isazophos		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Malathion		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Metazachlor		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Methoprothryn		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Nitrapyrin		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	o-Phenylphenol		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Oxyfluorfen		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Paclobutrazol		0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dicrotophos		0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diphenamid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	EPTC	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Ethalfluralin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Etridiazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Hexazinone	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Demeton-O	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Monocrotophos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Nitralin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Norflurazon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isocarbamid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Napropamide	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pebulate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phenthoate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phosphamidon	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isopropalin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Propamocarb	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Esfenvalerate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Tefluthrin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Flutriafol	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Propyzamide	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Thionazin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorthal-dimethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Endosulfan I (alpha-endosulfan)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Endosulfan II (beta-Endosulfan)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Butylate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Crotoxyphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Demeton-S-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Demeton-S	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diallate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorpropham (CIPC)	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorpyrifos-methyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlorthion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Chlozolinate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Coumaphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cyanazine	0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cyanofenphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cyanophos	0.05 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	HCH, delta-	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Deltamethrin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dichlobenil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dichlofenthion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dichlofluanid	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dicloran	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dichlorvos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Diclobutrazol	0.01 kg	mg	AOAC 2007.01

PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Dicofol, p,p-	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Disulfoton	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Ethoprophos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Ethoxyquin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Etrimfos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenchlorphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenitrothion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenson	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fensulfothion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenthion	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenvalerate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fluchloralin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fonofos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Iprodione	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Isodrin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Lenacil	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Leptophos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Methamidophos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Methacriphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Mevinphos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Nitrofen	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Omethoate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Parathion oxygen analog	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Parathion-methyl oxygen analog	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pentachloranisole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pentachlorobenzene	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Pentachloroaniline	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phorate	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Phosmet	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Profenofos	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Profluralin	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Mefenpyr-diethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Simazine	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Nitrothal-isopropyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Triticonazole	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Cloquintocet-mexyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Fenoxaprop-p-ethyl	0.01 kg	mg	AOAC 2007.01
PQA0E-1	Pesticides- Quechers for Fruits and Vegetables	QA01P-1	Picoxystrobin	0.01 kg	mg	AOAC 2007.01

Appendix 3. Estimated Daily Intake of Corn Protein Proposed for Use in Select Foods among the U.S. Population (Exponent, 2019)

Exponent®

Center for Chemical Regulation and Food Safety

Estimated Daily Intake of Corn Protein Proposed for Use in Select Foods Among the U.S. Population

Estimated Daily Intake of Corn Protein Proposed for Use in Select Foods Among the U.S. Population

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March 15, 2019

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List of Acronyms

bw	Bodyweight
DHHS	U.S. Department of Health and Human Services
EDI	Estimated Daily Intake
FARE®	Foods Analysis and Residues Evaluation Program
FDA	U.S. Food and Drug Administration
FNDDS	Food and Nutrient Database for Dietary Studies
FPED	Food Pattern Equivalents Database
FPID	Food Patterns Equivalents Ingredients Database
g	Gram
kg	Kilogram
mo	Month
NCHS	National Center for Health Statistics
NHANES	National Health and Nutrition Examination Survey
RTD	Ready-to-drink
RTE	Ready-to-eat
SR	Standard Reference
U.S.	United States
USDA	U.S. Department of Agriculture
VIF	Variance Inflation Factor
WWEIA	What We Eat in America
y	Years

Introduction

At the request of Cargill, Inc. (Cargill), Exponent, Inc. (Exponent) conducted an intake assessment to estimate the total daily intake of corn protein proposed for use in 15 food categories. The estimated daily intake (EDI) of corn protein was based on foods reported consumed in the *What We Eat in America* (WWEIA) dietary component of the National Health and Nutrition Examination Survey (NHANES) 2013-2016. Corn protein estimates were provided for the total U.S. population and subpopulations of infants, children, adolescents, and adults. The data and methods used to conduct the intake assessment and results are summarized in this report.

Data and Methods

Proposed Use and Levels

Corn protein is proposed for use in 15 food categories including bakery products, cooked pasta (from fresh or dry), ready-to-eat (RTE) cereals, processed meats, meat analogs & vegetarian products, snack foods, nutrition bars, mixed dishes with sauce, nut butters (excluding full-fat peanut butter), dairy analog products, cream-based sauces, protein and nutritional powders, ready-to-drink (RTD) protein beverages, non-dairy beverages, and batter/breading/coating for frying. The proposed use levels of corn protein range from 0.08% to 40% in the finished product (i.e., the food as consumed). Table 1 lists the proposed use foods as well as the corresponding use level of corn protein for each food type.

Table 1. Proposed Food Uses and Levels

Food Category	Proposed Food Uses	Use Level (%) As Consumed
Bakery products	Bakery products including flatbread and pizza crust (all types including gluten-free), gluten-free biscuits, bread, English muffins, and muffins	5
Batter/breading/coating for frying	Batter/breading/coating for frying	2
Cereal, RTE	RTE cereal, all types	15
Dairy analog products	All types of dairy analog products including imitation cheese and sour cream, cream substitute, non-dairy topping, margarine and margarine-like spreads, tofu frozen dessert, rice dessert bar, ices and sorbet	2
Meat analogs & vegetarian food products	Meat analogs & vegetarian food products including vegetable protein, vegetarian meat loaf, vegetarian stew, meatless bacon, chicken analogs, breakfast link, fish stick, vegetarian frankfurter, luncheon meat, meatball, vegetarian burger or patty, vegetarian dishes (i.e., pot pie, chili, stew, stroganoff)	40
Mixed dishes with sauce	Prepackaged products with sauce including frozen meals; canned products such as Chef Boyardee products and creamed vegetables; box mixes such as Hamburger Helper, Rice-A-Roni, Easy Mac, and scalloped and mashed potato; pot pie	0.08
Non-dairy beverages	Milk substitutes including soy milk, almond milk, rice milk, coconut milk, and other imitation milks	12
Nut butters (except full-fat peanut butter)	Nut butters including almond, cashew, and peanut (excluding full-fat peanut butter)	10
Nutritional bars	Nutrition and meal replacement bars including Zone Perfect, Clif bar, South Beach Living bars, Kashi bars, PowerBar, SlimFast bar, Snickers Marathon energy, protein bars	25
Pasta, cooked	Cooked pastas including macaroni, spaghetti noodles, lasagna noodles, ravioli, other pasta noodles	5
Processed meats	Processed meats including sausage, luncheon meats, frankfurter, cured ham, pastrami, pate, pepperoni, salami, chicken nuggets, patties	10
Protein and nutritional powders	Non-reconstituted powder mix including Carnation Instant Breakfast, Muscle Milk, Slim Fast, protein powder/mix, milkshake mix	3
Protein beverages, RTD	RTD nutritional drink or meal replacement beverage high in protein	3
Sauces, cream-based	Cream-based sauces including cheese sauce, cream sauce, milk sauce, lemon-butter sauce, hollandaise sauce, horseradish sauce	1.5
Snack foods	Snack foods including cereal and granola bars, crackers, extruded potato chips, pretzel/snack mix, tortilla chips, corn chips, other veggie/puff chips	15

Consumption Data

Corn protein intakes from proposed foods was based on food consumption records collected in the WWEIA component of NHANES conducted in 2013-2014 and 2015-2016 cycles (NHANES 2013-2016). This continuous survey is a complex, multistage, probability sample designed to be representative of the civilian US population (National Center of Health Statistics 2016, 2018). The NHANES datasets provide nationally representative nutrition and health data and prevalence estimates for nutrition and health status measures in the United States. Statistical weights are provided by the National Center for Health Statistics (NCHS) to adjust for the differential probabilities of selection. As part of the examination, trained dietary interviewers collected detailed information on all foods and beverages consumed by respondents in the previous 24 hour time period (midnight to midnight). A second dietary recall was administered by telephone three to ten days after the first dietary interview, but not on the same day of the week as the first interview. The dietary component of the survey is conducted as a partnership between the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (DHHS). DHHS is responsible for the sample design and data collection, and USDA is responsible for the survey's dietary data collection methodology, maintenance of the databases used to code and process the data, and data review and processing. A total of 14,601 individuals in the 2013-2016 survey period provided two complete days of dietary recalls.

Food and Nutrient Database for Dietary Studies (FNDDS)

For each food reported in NHANES, the USDA Food and Nutrient Database for Dietary Studies (FNDDS) databases translates foods as reported consumed into one or more ingredients (and gram amounts) or recipes. The FNDDS also provides information on the amount of energy and approximately 60 nutrients or food constituents per 100 g of each food based on the National Nutrient Database for Standard Reference (SR). Exponent applied FNDDS version 2015-2016 food recipes (USDA 2018a) to process dietary recall data reported in NHANES 2013-2016 and FNDDS version 2013-2014 recipes (USDA 2016a) for foods that were only reported consumed in NHANES 2013-2014.

Food Patterns Equivalents Database (FPED)

The Food Pattern Equivalents Database (FPED) is developed by the USDA and translates each food reported consumed in the NHANES into 37 dietary components (e.g., fruits, vegetables, grains, protein foods, etc.) per 100 grams of each NHANES food. In addition, the FPED includes the Food Patterns Equivalents Ingredients Database (FPID) for ingredients of the foods in FNDDS. Exponent applied FPID 2015-2016 (USDA 2018b) to process dietary recall data reported in NHANES 2013-2016 and FPID 2013-2014 (USDA 2017) for foods that were only reported consumed in NHANES 2013-2014.

NHANES Food Selection

Consumption data in the NHANES survey are reported on an "as consumed basis". That is, if a survey participant consumed a roast beef sandwich, the consumption amount reported in the survey for that subject would be for the total amount of the whole sandwich consumed, and not for the ingredients (bread, meat, lettuce, tomato, and mayonnaise) used to make that sandwich. Exponent utilized the USDA's FNDDS recipes for many of the foods uses of corn protein; however, when the recipes did not have a complete breakdown of ingredients for a given food, an alternate approach was taken to identify food components with proposed uses of corn protein. The alternate approaches were applied to identify food uses of corn protein within food mixtures as described below:

- Bakery products – FNDDS recipes were applied to identify the biscuit, English muffin, flatbread, and pizza crust components in food mixtures such as sandwiches and pizzas. Pizza crust contribution of a pizza was assumed to be 50% based on the average pizza crust content for those with recipe breakdowns.
- Batter/breading/coating for frying – All coated, battered, and breaded foods were identified along with its corresponding dry or soft bread crumb component, if available, using the FNDDS recipe database. Due to inconsistent and incomplete recipes for many of these foods, the maximum bread crumb proportion of 24% among meats and 10% among mixed dishes with recipes was assumed for all identified foods belonging in these respective food categories.

- Pasta, cooked – All pasta ingredients with proposed uses of corn protein (including pasta-containing ingredients) were identified based on the FNDDS recipes which included both cooked and uncooked forms. Using both the FPID (USDA 2017, 2018b) and SR (USDA 2016c) databases, all pastas of interest were converted to the cooked form to identify cooked pastas reported consumed as is or as part of a mixed dish.
- Processed meats – All processed meat ingredients with proposed uses of corn protein (including processed meat-containing ingredients) were identified based on the FNDDS recipes in combination with the FPID.
- Sauces, cream-based – All cream-based sauce ingredients with proposed uses of corn protein were identified based on the FNDDS recipes. Foods with descriptions containing "cream" or "cheese" and "sauce" that were not identified as containing a cream-based sauce ingredient within the FNDDS recipes were given the average sauce component among similar foods with recipes within the same WWEIA category designation.

Identification of the weight of ingredients in foods allowed for the estimation of the select foods with corn protein proposed uses that can be consumed as is or as a component in a food (i.e., deli meat in sandwiches and corn chips in Mexican casseroles or taco salads). NHANES foods corresponding to all other food categories were identified based on the food description of the food reported as consumed or on the USDA recipe database. The list of all NHANES food codes (and their descriptions) included in the analysis can be found in Appendix I.

Analysis

Using the NHANES consumption data, Exponent estimated the 2-day average daily intake on a "per capita" and "per user" basis. Per capita estimates refer to the consumption based on the entire population of interest whereas per user estimates refer to those who reported consuming any of the foods within a given food product category on either of the survey days. We identifed each participant who reported consuming a proposed food on either of the survey days, and we use that individual's responses for both survey days. Zero consumption days are included in calculating that individual's average daily intake. For example, if someone reported consuming 30 grams (g) of crackers on day 1 and 50 g of crackers on day 2, his/her 2-day average cracker consumption would be 40 g ([30 + 50]/2). The analysis was limited to individuals who provided

two complete and reliable dietary recalls as determined by NCHS. The 2-day average intakes by each individual were estimated using Exponent's Foods Analysis and Residues Evaluation Program (FARE® version 13.03) software. Exponent used the statistically weighted values from the survey in its analyses. The statistical weights compensate for variable probabilities of participant selection, adjusted for non-response, and provide intake estimates that are representative of the U.S. population.

In the analysis, the 2-day average intake of corn protein was estimated by multiplying the reported intake of foods from the 24-hr recall with the proposed use level (see Table 1) and the cumulative sum over the two 24-hr recalls was divided by two.

Two-day average estimates were derived for each proposed food use category as well as from all food uses combined. Estimates were also derived on a body weight (bw) basis based on each participant's measured body weight and derived for the total U.S. population and the following age subpopulations:

- Infants, ages 0 to 11 mo;
- Children, ages 1 to 6 y;
- Children, ages 7 to 12 y;
- Adolescents, ages 13 to 19 y; and
- Adults, ages 20 y and older.

Flagging of Statistically Unreliable Estimates

Per user estimates of consumption that may be less statistically reliable due to inadequate sample sizes are flagged with an asterisk (*) next to the food category name in the summary tables provided in the *Results* section below. The flagging of statistically unreliable estimates is based on guidance from NCHS (NCHS 1996). Specifically, estimates of mean consumption are flagged when estimates are based on a sample size of less than 30 times the variance inflation factor (VIF) and estimates of 90th percentiles of consumption are flagged when based on a sample size of less than 8 times the VIF and divided by 0.10 (i.e., 8 x VIF/0.10). VIF estimates estimated by the USDA were 1.98 and 2.41 for the NHANES periods 2013-2014 and 2015-2016,

respectively (USDA 2016b, 2018c). Exponent is not aware of a published VIF estimate for the combined NHANES 2013-2016.

In this analysis, Exponent assumed a VIF of 2.41 from NHANES 2015-2016 (USDA 2018c). Using the VIF of 2.41, estimated mean consumption is flagged when based on a sample size of less than 72 (30 x 2.41). Similarly, using a VIF of 2.41, estimated 90th percentile consumption is flagged when based on a sample size of less than 193 (8 x 2.41/0.10).

Results

Two-day average corn protein intake estimates from the proposed use in 15 food categories were calculated based on food consumption data collected in NHANES 2013-2016. Both the *per capita* and *per user* mean and 90th percentile results for the U.S. population; infants age 0-11 mo; children 1-6 y, 7-12 y; adolescents 13-19 y; and adults 20+ y in g/day by food category and all proposed food uses are provided in Table 2. These estimates for the total U.S. population and subpopulations on a g/kg bw/day basis are also included in Table 2. Table 3 summarizes the estimated cumulative intake of corn protein from all proposed food uses by population group.

Table 2. Two-day average estimated daily intake (EDI) of corn protein by proposed food use categories among the total U.S. population and sub-populations; NHANES 2013-2016

			Per Capita		Per User		Per Capita		Per User	
Food Category	N[1]	% User	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile
			- - - - g/day - - - -				- - - - g/kg-bw/day - - - -			
Total U.S.										
Bakery products	4,985	36	1.1	3.9	3.2	6.4	0.02	0.06	0.05	0.11
Batter/breading/coating for frying	3,325	22	0.1	0.3	0.4	0.7	<0.005	<0.005	0.01	0.01
Cereal, RTE	5,180	35	1.8	6.3	5.3	10.0	0.03	0.11	0.10	0.20
Dairy analog products	7,050	52	0.1	0.4	0.3	0.7	<0.005	0.01	<0.005	0.01
Meat analogs & vegetarian food products	246	2	0.4	0	17.0	38.4	0.01	0	0.25	0.76
Mixed dishes with sauce, prepackaged	2,323	17	<0.05	0.1	0.1	0.2	<0.005	<0.005	<0.005	<0.005
Non-dairy beverages	711	6	1.1	0	20.1	41.1	0.02	0	0.39	0.72
Nut butters (excluding full-fat peanut butter)**	162	2	<0.05	0	1.8	3.2	<0.005	0	0.03	0.07
Nutrition bars	291	3	0.3	0	8.9	16.2	<0.005	0	0.13	0.24
Pasta (fresh and dry)	4,618	32	1.3	4.5	4.0	7.8	0.02	0.08	0.07	0.16
Processed meats	9,885	69	3.4	8.8	4.8	10.4	0.06	0.15	0.08	0.19
Protein and nutritional powders	297	3	<0.05	0	1.1	1.9	<0.005	0	0.02	0.03
Protein beverages, RTD**	166	2	0.2	0	9.9	19.1	<0.005	0	0.14	0.29
Sauces, cream-based	1,105	8	<0.05	0	0.5	1.0	<0.005	0	0.01	0.02
Snack foods	7,413	55	2.2	6.3	4.0	8.4	0.04	0.11	0.08	0.17
All proposed uses	13,842	97	12.2	24.1	12.5	24.3	0.22	0.48	0.22	0.49
Infants 0-11 mo										
Bakery products*	26	3	<0.05	0	0.7	1.7	<0.005	0	0.08	0.18

Food Category	N[1]	% User	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile
			- - - - g/day - - - -				- - - - g/kg-bw/day - - - -			
Batter/breading/coating for frying*	7	2	<0.05	0	0.1	NA	<0.005	0	0.01	NA
Cereal, RTE*	49	8	0.1	0	0.9	2.1	0.01	0	0.10	0.23
Dairy analog products**	82	11	<0.05	<0.05	<0.05	0.1	<0.005	<0.005	<0.005	0.01
Meat analogs & vegetarian food products*	0	0	NA	NA	NA	NA	NA	NA	NA	NA
Mixed dishes with sauce, prepackaged*	39	6	<0.05	0	0.1	0.2	<0.005	0	0.01	0.02
Non-dairy beverages*	5	1	0.2	0	15.4	NA	0.02	0	1.96	NA
Nut butters (excluding full-fat peanut butter)*	0	0	NA	NA	NA	NA	NA	NA	NA	NA
Nutrition bars*	1	0	0.1	0	14.1	NA	0.01	0	1.81	NA
Pasta (fresh and dry)*	53	8	0.1	0	1.3	3.1	0.01	0	0.14	0.29
Processed meats**	72	11	0.2	0.1	1.9	4.6	0.02	0.01	0.21	0.53
Protein and nutritional powders*	0	0	NA	NA	NA	NA	NA	NA	NA	NA
Protein beverages, RTD*	0	0	NA	NA	NA	NA	NA	NA	NA	NA
Sauces, cream-based*	9	2	<0.05	0	0.2	NA	<0.005	0	0.02	NA
Snack foods**	78	12	0.2	0.4	1.3	3.0	0.02	0.04	0.15	0.41
All proposed uses	194	29	0.8	2.8	2.9	7.4	0.10	0.29	0.33	0.75
Children 1-6 y										
Bakery products	684	41	0.8	3.0	2.1	4.1	0.05	0.16	0.11	0.23
Batter/breading/coating for frying	297	15	<0.05	0.1	0.2	0.3	<0.005	<0.005	0.01	0.02
Cereal, RTE	1,055	60	1.9	5.4	3.2	6.9	0.12	0.32	0.19	0.40
Dairy analog products	799	46	0.1	0.4	0.2	0.7	0.01	0.02	0.01	0.04

Food Category	N[1]	% User	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile
			- - - - g/day - - - -				- - - - g/kg-bw/day - - - -			
Meat analogs & vegetarian food products*	15	1	0.1	0	9.6	21.1	0.01	0	0.63	1.17
Mixed dishes with sauce, prepackaged	456	27	<0.05	0.1	0.1	0.2	<0.005	0.01	0.01	0.01
Non-dairy beverages**	91	5	1.2	0	22.8	46.4	0.09	0	1.66	4.40
Nut butters (excluding full-fat peanut butter)*	27	2	<0.05	0	1.2	2.7	<0.005	0	0.07	0.15
Nutrition bars*	15	1	0.1	0	4.9	9.0	<0.005	0	0.28	0.50
Pasta (fresh and dry)	715	40	1.1	3.3	2.6	5.3	0.06	0.20	0.16	0.33
Processed meats	1,308	77	3.2	7.7	4.2	8.5	0.19	0.45	0.24	0.50
Protein and nutritional powders*	17	2	<0.05	0	0.5	1.7	<0.005	0	0.04	0.12
Protein beverages, RTD*	8	0	<0.05	0	3.7	NA	<0.005	0	0.20	NA
Sauces, cream-based**	140	8	<0.05	0	0.3	0.6	<0.005	0	0.02	0.04
Snack foods	1,145	70	2.4	6.0	3.4	6.7	0.15	0.36	0.21	0.43
All proposed uses	1,725	99	11.1	19.8	11.2	19.9	0.68	1.17	0.68	1.18
Children 7-12 y										
Bakery products	806	47	1.4	4.1	3.0	5.4	0.04	0.11	0.08	0.16
Batter/breading/coating for frying	392	20	0.1	0.2	0.3	0.6	<0.005	0.01	0.01	0.02
Cereal, RTE	933	53	2.5	7.0	4.6	9.0	0.07	0.21	0.13	0.27
Dairy analog products	780	50	0.1	0.5	0.3	0.8	<0.005	0.02	0.01	0.03
Meat analogs & vegetarian food products*	25	2	0.2	0	11.2	38.8	0.01	0	0.33	0.94
Mixed dishes with sauce, prepackaged	351	23	<0.05	0.1	0.1	0.2	<0.005	<0.005	<0.005	0.01

Food Category	N[1]	% User	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile
			- - - - g/day - - - -				- - - - g/kg-bw/day - - - -			
Non-dairy beverages*	39	2	0.4	0	18.0	33.8	0.01	0	0.55	1.08
Nut butters (excluding full-fat peanut butter)*	11	1	<0.05	0	1.2	1.6	<0.005	0	0.04	0.05
Nutrition bars*	16	2	0.1	0	7.2	10.1	<0.005	0	0.22	0.30
Pasta (fresh and dry)	661	38	1.5	5.2	3.8	7.4	0.04	0.14	0.11	0.23
Processed meats	1,382	81	3.9	9.1	4.8	9.8	0.11	0.27	0.14	0.29
Protein and nutritional powders*	13	1	<0.05	0	0.4	0.6	<0.005	0	0.01	0.01
Protein beverages, RTD*	1	0	<0.05	0	2.3	NA	<0.005	0	0.04	NA
Sauces, cream-based**	146	9	<0.05	0	0.5	1.0	<0.005	0	0.01	0.03
Snack foods	1,095	67	2.9	7.3	4.4	8.9	0.08	0.22	0.13	0.25
All proposed uses	1,691	99	13.1	23.9	13.2	23.9	0.38	0.68	0.38	0.68
Adolescents 13-19 y										
Bakery products	806	45	1.6	5.1	3.6	6.5	0.02	0.08	0.05	0.10
Batter/breading/coating for frying	429	21	0.1	0.3	0.4	0.8	<0.005	<0.005	0.01	0.01
Cereal, RTE	780	45	2.6	8.2	5.8	11.2	0.04	0.12	0.09	0.18
Dairy analog products	641	38	0.1	0.1	0.2	0.6	<0.005	<0.005	<0.005	0.01
Meat analogs & vegetarian food products*	35	3	0.3	0	10.3	37.0	<0.005	0	0.16	0.41
Mixed dishes with sauce, prepackaged	267	16	<0.05	0.1	0.1	0.3	<0.005	<0.005	<0.005	<0.005
Non-dairy beverages*	58	3	0.7	0	22.2	37.4	0.01	0	0.38	0.55
Nut butters (excluding full-fat peanut butter)*	11	1	<0.05	0	1.7	2.3	<0.005	0	0.03	0.04
Nutrition bars*	40	2	0.2	0	8.0	17.0	<0.005	0	0.12	0.19
Pasta (fresh and dry)	606	32	1.4	5.2	4.4	9.0	0.02	0.08	0.07	0.14

Food Category	N[1]	% User	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile	Per Capita Mean	Per Capita 90th Percentile	Per User Mean	Per User 90th Percentile
			- - - - g/day - - - -				- - - - g/kg-bw/day - - - -			
Processed meats	1,370	77	4.1	10.2	5.3	11.3	0.06	0.15	0.08	0.18
Protein and nutritional powders*	34	2	<0.05	0	1.2	2.0	<0.005	0	0.02	0.03
Protein beverages, RTD*	14	1	0.1	0	13.6	31.7	<0.005	0	0.21	0.52
Sauces, cream-based**	154	8	<0.05	0	0.6	1.0	<0.005	0	0.01	0.02
Snack foods	1,031	58	2.5	6.4	4.3	8.6	0.04	0.10	0.07	0.15
All proposed uses	1,802	99	13.7	25.9	13.8	25.9	0.21	0.41	0.21	0.41
Adults 20+ y										
Bakery products	2,663	33	1.1	3.9	3.3	6.5	0.01	0.05	0.04	0.08
Batter/breading/coating for frying	2,200	23	0.1	0.3	0.4	0.7	<0.005	<0.005	<0.005	0.01
Cereal, RTE	2,363	30	1.7	6.1	5.8	10.9	0.02	0.08	0.07	0.14
Dairy analog products	4,748	55	0.1	0.5	0.3	0.7	<0.005	0.01	<0.005	0.01
Meat analogs & vegetarian food products**	171	3	0.5	0	18.9	50.5	0.01	0	0.23	0.62
Mixed dishes with sauce, prepackaged	1,210	16	<0.05	0.1	0.1	0.3	<0.005	<0.005	<0.005	<0.005
Non-dairy beverages	518	6	1.3	0	19.9	41.1	0.02	0	0.27	0.55
Nut butters (excluding full-fat peanut butter)**	113	2	<0.05	0	1.9	3.2	<0.005	0	0.03	0.05
Nutrition bars	219	4	0.4	0	9.1	16.9	<0.005	0	0.12	0.22
Pasta (fresh and dry)	2,583	31	1.3	4.5	4.2	8.4	0.02	0.06	0.05	0.11
Processed meats	5,753	68	3.3	8.8	4.9	10.8	0.04	0.11	0.06	0.13
Protein and nutritional powders	233	4	<0.05	0	1.1	1.9	<0.005	0	0.01	0.03
Protein beverages, RTD**	143	2	0.2	0	9.8	17.6	<0.005	0	0.13	0.28

Food Category	N[1]	% User	Per Capita Mean (g/day)	Per Capita 90th Percentile (g/day)	Per User Mean (g/day)	Per User 90th Percentile (g/day)	Per Capita Mean (g/kg-bw/day)	Per Capita 90th Percentile (g/kg-bw/day)	Per User Mean (g/kg-bw/day)	Per User 90th Percentile (g/kg-bw/day)
Sauces, cream-based	656	9	<0.05	0	0.5	1.0	<0.005	0	0.01	0.01
Snack foods	4,064	53	2.1	6.3	4.1	8.5	0.03	0.08	0.05	0.11
All proposed uses	8,430	98	12.2	24.4	12.5	24.6	0.16	0.31	0.16	0.31

[1] Unweighted number of users; %user, per user estimates based on NHANES and derived using the statistical weights provided by the NCHS.

* Sample size inadequate to provide reliable estimates at the *per user* mean and 90th percentile of intake.

** Sample size inadequate to provide reliable estimates at the *per user* 90th percentile of intake.

NA = Not available; estimate not calculated when the unweighted number of users is less than 10.

Note: Corn protein use levels provided in Table 1.

Table 3. Two-day average estimated daily intake (EDI) of corn protein from all proposed food uses among the total U.S. population and sub-populations; NHANES 2013-2016

							Per User			
	N[1]	% Users	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile	Mean	90th Percentile
			- - - - g/day - - - -				- - - - g/kg-bw/day - - - -			
Total U.S.	13,842	97	12.2	24.1	12.5	24.3	0.22	0.48	0.22	0.49
Infants 0-11 mo	194	29	0.8	2.8	2.9	7.4	0.10	0.29	0.33	0.75
Children 1-6 y	1,725	99	11.1	19.8	11.2	19.9	0.68	1.17	0.68	1.18
Children 7-12 y	1,691	99	13.1	23.9	13.2	23.9	0.38	0.68	0.38	0.68
Adolescents 13-19 y	1,802	99	13.7	25.9	13.8	25.9	0.21	0.41	0.21	0.41
Adults 20+ y	8,430	98	12.2	24.4	12.5	24.6	0.16	0.31	0.16	0.31

[1] Unweighted number of users; %user, *per capita* and *per user* estimates based on NHANES and derived using the statistical weights provided by the NCHS.

Conclusions

Consumption data and information pertaining to the proposed food use of corn protein were used to estimate the *per capita* and *per user* intakes of corn protein for the total U.S. population and select age subpopulations. The methodology in this study relied on the dietary recall component of the NHANES survey which consists of two non-consecutive 24-hour recalls. The estimates based on 2-day average intakes do not necessarily represent long-term intakes, since (1) they may not capture infrequent consumers of foods proposed to contain corn protein, (2) assume that subjects who consumed corn protein-containing products on both survey days actually consume these corn protein products every day of the year, and (3) do not adjust for potential day-to-day variation in corn protein intake.

In summary, on a *per capita* basis, the mean intake of corn protein by the total U.S. population from all proposed food uses was estimated to be 12.2 g/day or 0.22 g/kg bw/day. At the *per user* 90th percentile (i.e., heavy users), intake of corn protein by the total U.S. population from all proposed food uses was estimated to be 24.3 g/day or 0.49 g/kg bw/day.

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Appendix I: NHANES Food Codes Used in Analysis

Food code	Food description
Bakery products	
27515050	Fajita-style beef sandwich with cheese, on pita bread, with lettuce and tomato*
27515080	Steak sandwich, plain, on biscuit*
27516010	Gyro sandwich (pita bread, beef, lamb, onion, condiments), with tomato and spread*
27520170	Bacon on biscuit*
27520250	Ham on biscuit*
27540145	Chicken fillet, breaded, fried, sandwich on biscuit*
27540180	Chicken patty sandwich or biscuit*
27540200	Fajita-style chicken sandwich with cheese, on pita bread, with lettuce and tomato*
27560650	Sausage on biscuit*
27560670	Sausage and cheese on English muffin*
27560705	Sausage balls, made with biscuit mix and cheese*
32101500	Egg, Benedict*
32202010	Egg, cheese, and ham on English muffin*
32202020	Egg, cheese, and ham on biscuit*
32202030	Egg, cheese, and sausage on English muffin*
32202040	Egg, cheese, and beef on English Muffin*
32202050	Egg, cheese, and sausage on biscuit*
32202060	Egg and sausage on biscuit*
32202070	Egg, cheese, and bacon on biscuit*
32202080	Egg, cheese, and bacon on English muffin*
32202090	Egg and bacon on biscuit*
32202110	Egg and ham on biscuit*
32202130	Egg and steak on biscuit*
32202200	Egg and cheese on biscuit*
51108010	Focaccia, Italian flatbread, plain
51108100	Naan, Indian flatbread
51109100	Bread, pita
51109110	Bread, pita, toasted
51109150	Bread, pita with fruit
51186010	Muffin, English
51186100	Muffin, English, with raisins*
51186160	Muffin, English, with fruit other than raisins*
51300185	Bread, paratha, wheat
51301600	Bread, pita, whole wheat
51301610	Bread, pita, whole wheat, toasted
51301620	Bread, pita, wheat or cracked wheat
51302500	Muffin, English, wheat bran
51303010	Muffin, English, wheat or cracked wheat
51303030	Muffin, English, whole wheat
51303050	Muffin, English, wheat or cracked wheat, with raisins
51303070	Muffin, English, whole wheat, with raisins
51303100	Muffin, English, whole grain white
51630200	Muffin, English, multigrain
51808000	Bread, gluten free
51808010	Bread, gluten free, toasted

Food code	Food description
51808100	Roll, gluten free
52101000	Biscuit, baking powder or buttermilk type, NS as to made from mix, refrigerated dough, or home recipe
52101030	Biscuit dough, fried
52101100	Biscuit, baking powder or buttermilk type, made from mix
52102040	Biscuit, baking powder or buttermilk type, made from refrigerated dough
52103000	Biscuit, baking powder or buttermilk type, commercially baked
52104010	Biscuit, baking powder or buttermilk type, made from home recipe
52104040	Biscuit, whole wheat
52104100	Biscuit, cheese
52104200	Biscuit, cinnamon-raisin
52206010	Cornbread muffin, stick, round
52206060	Cornbread muffin, stick, round, made from home recipe
52301000	Muffin, NFS
52302010	Muffin, fruit
52302020	Muffin, fruit, low fat
52302500	Muffin, chocolate chip
52302600	Muffin, chocolate
52303010	Muffin, whole wheat
52304000	Muffin, whole grain
52304010	Muffin, wheat bran
52304040	Muffin, bran with fruit, lowfat
52304100	Muffin, oatmeal
52304150	Muffin, oat bran
52306010	Muffin, plain
52306500	Muffin, pumpkin
52306550	Muffin, zucchini
52306700	Muffin, carrot
54408485	Pretzels, soft, gluten free
54408487	Pretzels, soft, gluten free, coated or flavored
55106000	Pancakes, gluten free
55200090	Waffle, gluten free, from frozen
55208000	Waffle, gluten free
55301025	French toast, gluten free
58106200	Pizza, cheese, from frozen, thin crust*
58106205	Pizza, cheese, from frozen, thick crust*
58106210	Pizza, cheese, from restaurant or fast food, NS as to type of crust*
58106220	Pizza, cheese, from restaurant or fast food, thin crust*
58106225	Pizza, cheese, from restaurant or fast food, medium crust*
58106230	Pizza, cheese, from restaurant or fast food, thick crust*
58106233	Pizza, cheese, stuffed crust*
58106234	Pizza, cheese, from school lunch, medium crust*
58106235	Pizza, cheese, from school lunch, thin crust*
58106236	Pizza, cheese, from school lunch, thick crust*
58106250	Pizza, extra cheese, thin crust*
58106255	Pizza, extra cheese, regular crust*
58106260	Pizza, extra cheese, thick crust*
58106300	Pizza, cheese, with vegetables, from frozen, thin crust*
58106305	Pizza, cheese with vegetables, from frozen, thick crust*
58106310	Pizza, cheese, with vegetables, NS as to type of crust*

Food code	Food description
58106320	Pizza, cheese, with vegetables, from restaurant or fast food, thin crust*
58106325	Pizza, cheese, with vegetables, from restaurant or fast food, medium crust*
58106330	Pizza, cheese, with vegetables, from restaurant or fast food, thick crust*
58106345	Pizza with cheese and extra vegetables, thin crust*
58106347	Pizza with cheese and extra vegetables, medium crust*
58106350	Pizza with cheese and extra vegetables, thick crust*
58106358	Pizza, cheese, with fruit, thin crust*
58106359	Pizza, cheese, with fruit, medium crust*
58106360	Pizza, cheese, with fruit, thick crust*
58106500	Pizza with meat, prepared from frozen, thin crust*
58106505	Pizza with meat, prepared from frozen, thick crust*
58106512	Pizza with pepperoni, from frozen, thin crust*
58106514	Pizza with pepperoni, from frozen, medium crust*
58106516	Pizza with pepperoni, from frozen, thick crust*
58106540	Pizza with pepperoni, from restaurant or fast food, NS as to type of crust*
58106550	Pizza with pepperoni, from restaurant or fast food, thin crust*
58106555	Pizza with pepperoni, from restaurant or fast food, medium crust*
58106560	Pizza with pepperoni, from restaurant or fast food, thick crust*
58106565	Pizza with pepperoni, stuffed crust*
58106570	Pizza with pepperoni, from school lunch, thin crust*
58106578	Pizza, with pepperoni, from school lunch, medium crust*
58106580	Pizza with pepperoni, from school lunch, thick crust*
58106602	Pizza with meat other than pepperoni, from frozen, thin crust*
58106604	Pizza with meat other than pepperoni, from frozen, medium crust*
58106606	Pizza with meat other than pepperoni, from frozen, thick crust*
58106610	Pizza with meat other than pepperoni, from restaurant or fast food, NS as to type of crust*
58106620	Pizza with meat other than pepperoni, from restaurant or fast food, thin crust*
58106625	Pizza with meat other than pepperoni, from restaurant or fast food, medium crust*
58106630	Pizza with meat other than pepperoni, from restaurant or fast food, thick crust*
58106633	Pizza, with meat other than pepperoni, stuffed crust*
58106634	Pizza, with meat other than pepperoni, from school lunch, medium crust*
58106635	Pizza, with meat other than pepperoni, from school lunch, thin crust*
58106636	Pizza, with meat other than pepperoni, from school lunch, thick crust*
58106640	Pizza with extra meat, NS as to type of crust*
58106650	Pizza with extra meat, thin crust*
58106655	Pizza with extra meat, medium crust*
58106660	Pizza with extra meat, thick crust*
58106700	Pizza with meat and vegetables, from frozen, thin crust*
58106702	Pizza with meat and vegetables, from frozen, medium crust*
58106705	Pizza with meat and vegetables, from frozen, thick crust*
58106720	Pizza with meat and vegetables, from restaurant or fast food, thin crust*
58106725	Pizza with meat and vegetables, from restaurant or fast food, medium crust*
58106730	Pizza with meat and vegetables, from restaurant or fast food, thick crust*
58106736	Pizza with extra meat and extra vegetables, thin crust*
58106737	Pizza with extra meat and extra vegetables, thick crust*
58106738	Pizza with extra meat and extra vegetables, medium crust*
58106750	Pizza with meat and fruit, thin crust*
58106755	Pizza with meat and fruit, medium crust*
58106760	Pizza with meat and fruit, thick crust*
58106820	Pizza with beans and vegetables, thin crust*

Food code	Food description
58107050	Pizza, no cheese, thin crust*
58107205	White pizza, cheese, thin crust*
58107212	White pizza, cheese, with vegetables, thin crust*
58107220	White pizza, thin crust*
58107222	White pizza, cheese, with meat, thin crust*
58107230	White pizza, thick crust*
58107232	White pizza, cheese, with meat and vegetables, thin crust*
58108000	Calzone, with cheese, meatless*
58108010	Calzone, with meat and cheese*
58108050	Pizza rolls*
58109015	Pizza, cheese, whole wheat thin crust*
58109020	Pizza, cheese, whole wheat thick crust*
58109030	Pizza, with meat, whole wheat thin crust*
58109050	Pizza, cheese and vegetables, whole wheat thin crust*
58109100	Pizza, cheese, gluten-free thin crust*
58109120	Pizza, with meat, gluten-free thin crust*
58109130	Pizza, with meat, gluten-free thick crust*
58109140	Pizza, cheese and vegetables, gluten-free thin crust*
58109210	Breakfast pizza with egg*
58128000	Biscuit with gravy*
Batter/breading/coating for frying	
14660200	Mozzarella sticks, breaded, baked, or fried*
21103110	Beef steak, breaded or floured, baked or fried, NS as to fat eaten*
21103120	Beef steak, breaded or floured, baked or fried, lean and fat eaten*
21103130	Beef steak, breaded or floured, baked or fried, lean only eaten*
21104110	Beef steak, battered, fried, NS as to fat eaten*
21104130	Beef steak, battered, fried, lean only eaten*
21500200	Ground beef or patty, breaded, cooked*
22000300	Pork, NS as to cut, breaded or floured, fried, NS as to fat eaten*
22000310	Pork, NS as to cut, breaded or floured, fried, lean and fat eaten*
22101140	Pork chop, breaded or floured, broiled or baked, lean and fat eaten*
22101150	Pork chop, breaded or floured, broiled or baked, lean only eaten*
22101300	Pork chop, breaded or floured, fried, NS as to fat eaten*
22101310	Pork chop, breaded or floured, fried, lean and fat eaten*
22101320	Pork chop, breaded or floured, fried, lean only eaten*
22101410	Pork chop, battered, fried, lean and fat eaten*
22101420	Pork chop, battered, fried, lean only eaten*
22201060	Pork steak or cutlet, battered, fried, lean and fat eaten*
22201320	Pork steak or cutlet, breaded or floured, broiled or baked, lean only eaten*
22201420	Pork steak or cutlet, breaded or floured, fried, lean only eaten*
22210310	Pork, tenderloin, breaded, fried*
23220030	Veal patty, breaded, cooked*
23321250	Venison/deer steak, breaded or floured, cooked, NS as to cooking method*
24107000	Chicken, NS as to part, coated, baked or fried, prepared with skin, NS as to skin/coating eaten, fat added in cooking*
24107001	Chicken, NS as to part, coated, baked or fried, prepared with skin, NS as to skin/coating eaten, fat not added in cooking*
24107010	Chicken, NS as to part, coated, baked or fried, prepared with skin, skin/coating eaten, fat added in cooking*

Food code	Food description
24107040	Chicken, NS as to part, coated, baked or fried, prepared skinless, NS as to coating eaten, fat added in cooking*
24107050	Chicken, NS as to part, coated, baked or fried, prepared skinless, coating eaten, fat added in cooking*
24127100	Chicken, breast, coated, baked or fried, prepared with skin, NS as to skin/coating eaten, fat added in cooking*
24127110	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, NS as to type of fat added in cooking*
24127112	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made with butter*
24127113	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made with oil*
24127115	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made without fat*
24127120	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, NS as to type of fat added in cooking*
24127130	Chicken, breast, from fast food, coated, baked or fried, prepared with skin, skin/coating eaten*
24127135	Chicken, breast, from fast food, coated, baked or fried, prepared with skin, skin/coating not eaten*
24127140	Chicken, breast, coated, baked or fried, prepared skinless, NS as to coating eaten, fat added in cooking*
24127141	Chicken, breast, coated, baked or fried, prepared skinless, NS as to coating eaten, fat not added in cooking*
24127150	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, NS as to type of fat added in cooking*
24127151	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with shortening*
24127152	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with butter*
24127153	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with oil*
24127154	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with cooking spray*
24127155	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made without fat*
24127160	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, NS as to type of fat added in cooking*
24127163	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made with oil*
24127165	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made without fat*
24127200	Chicken breast, fried, coated, skin / coating eaten, from raw*
24127202	Chicken breast, fried, coated, prepared skinless, coating eaten, from raw*
24127210	Chicken breast, fried, coated, skin / coating eaten, from pre-cooked*
24127220	Chicken breast, fried, coated, skin / coating eaten, from fast food / restaurant*
24127221	Chicken breast, fried, coated, skin / coating not eaten, from fast food / restaurant*
24127500	Chicken breast, baked, coated, skin / coating eaten*
24137210	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coating eaten, fat added in cooking*
24137211	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coating eaten, fat not added in cooking*
24137220	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coating not eaten, fat added in cooking*

Food code	Food description
24137250	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating eaten, fat added in cooking*
24137251	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating eaten, fat not added in cooking*
24137260	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating not eaten, fat added in cooking*
24137300	Chicken leg, drumstick and thigh, fried, coated, skin / coating eaten*
24137310	Chicken leg, drumstick and thigh, baked, coated, skin / coating eaten*
24147210	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, NS as to type of fat added in cooking*
24147212	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, made with butter*
24147213	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, made with oil*
24147215	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, made without fat*
24147220	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten, NS as to type of fat added in cooking*
24147223	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten, made with oil*
24147225	Chicken, drumstick, from fast food, coated, baked or fried, prepared with skin, NS as to skin/coating eaten*
24147230	Chicken, drumstick, from fast food, coated, baked or fried, prepared with skin, skin/coating eaten*
24147235	Chicken, drumstick, from fast food, coated, baked or fried, prepared with skin, skin/coating not eaten*
24147250	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, NS as to type of fat added in cooking*
24147251	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made with shortening*
24147252	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made with butter*
24147253	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made with oil*
24147255	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made without fat*
24147260	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, NS as to type of fat added in cooking*
24147263	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, made with oil*
24147265	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, made without fat*
24147300	Chicken drumstick, fried, coated, skin / coating eaten, from raw*
24147302	Chicken drumstick, fried, coated, prepared skinless, coating eaten, from raw*
24147310	Chicken drumstick, fried, coated, skin / coating eaten, from pre-cooked*
24147320	Chicken drumstick, fried, coated, skin / coating eaten, from fast food / restaurant*
24147321	Chicken drumstick, fried, coated, skin / coating not eaten, from fast food / restaurant*
24147400	Chicken drumstick, baked, coated, skin / coating eaten*
24157210	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, NS as to type of fat added in cooking*
24157213	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made with oil*

Food code	Food description
24157215	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made without fat*
24157220	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, NS as to type of fat added in cooking*
24157223	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, made with oil*
24157225	Chicken, thigh, from fast food, coated, baked or fried, prepared with skin, NS as to skin/coating eaten*
24157230	Chicken, thigh, from fast food, coated, baked or fried, prepared with skin, skin/coating eaten*
24157235	Chicken, thigh, from fast food, coated, baked or broiled, prepared with skin, skin/coating not eaten*
24157250	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, NS as to type of fat added in cooking*
24157253	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made with oil*
24157255	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made without fat*
24157260	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, NS as to type of fat added in cooking*
24157263	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, made with oil*
24157300	Chicken thigh, fried, coated, skin / coating eaten, from raw*
24157302	Chicken thigh, fried, coated, prepared skinless, coating eaten, from raw*
24157310	Chicken thigh, fried, coated, skin / coating eaten, from pre-cooked*
24157320	Chicken thigh, fried, coated, skin / coating eaten, from fast food*
24157321	Chicken thigh, fried, coated, skin / coating not eaten, from fast food*
24157330	Chicken thigh, fried, coated, skin / coating eaten, from restaurant*
24157331	Chicken thigh, fried, coated, skin / coating not eaten, from restaurant*
24157400	Chicken thigh, baked, coated, skin / coating eaten*
24167110	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, NS as to type of fat added in cooking*
24167113	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made with oil*
24167115	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made without fat*
24167119	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, made without fat*
24167120	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, NS as to type of fat added in cooking*
24167123	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, made with oil*
24167130	Chicken, wing, from fast food, coated, baked or fried, prepared with skin, skin/coating eaten*
24167135	Chicken, wing, from fast food, coated, baked or fried, prepared with skin, skin/coating not eaten*
24167200	Chicken wing, fried, coated, from raw*
24167210	Chicken wing, fried, coated, from pre-cooked*
24167220	Chicken wing, fried, coated, from fast food*
24167230	Chicken wing, fried, coated, from restaurant*
24167300	Chicken wing, baked, coated*
24168002	Chicken "wings", plain, from fast food / restaurant*
24168012	Chicken "wings", plain, from precooked*
24168022	Chicken "wings", plain, from other sources*
24168030	Chicken "wings", boneless, with hot sauce, from fast food / restaurant*

Food code	Food description
24168031	Chicken "wings", boneless, with hot sauce, from other sources*
24201060	Turkey, light meat, breaded, baked or fried, skin not eaten*
24201070	Turkey, light meat, breaded, baked or fried, skin eaten*
24201370	Turkey, light or dark meat, fried, coated, skin eaten*
26100130	Fish, NS as to type, coated, baked or broiled, made with oil*
26100133	Fish, NS as to type, coated, baked or broiled, made without fat*
26100140	Fish, NS as to type, coated, fried, made with oil*
26100142	Fish, NS as to type, coated, fried, made with margarine*
26105140	Carp, coated, fried*
26107110	Catfish, cooked, NS as to cooking method*
26107130	Catfish, coated, baked or broiled, made with oil*
26107133	Catfish, coated, baked or broiled, made without fat*
26107140	Catfish, coated, fried, made with oil*
26107143	Catfish, coated, fried, made without fat*
26109130	Cod, coated, baked or broiled, made with oil*
26109133	Cod, coated, baked or broiled, made without fat*
26109134	Cod, coated, baked or broiled, made with cooking spray*
26109140	Cod, coated, fried, made with oil*
26109144	Cod, coated, fried, made with cooking spray*
26111140	Croaker, coated, fried*
26115130	Flounder, coated, baked or broiled, made with oil*
26115132	Flounder, coated, baked or broiled, made with margarine*
26115133	Flounder, coated, baked or broiled, made without fat*
26115140	Flounder, coated, fried, made with oil*
26117130	Haddock, coated, baked or broiled, fat added in cooking*
26117131	Haddock, coated, baked or broiled, fat not added in cooking*
26117140	Haddock, coated, fried*
26119130	Herring, coated, baked or broiled, fat added in cooking*
26119131	Herring, coated, baked or broiled, fat not added in cooking*
26119140	Herring, coated, fried*
26121140	Mackerel, coated, fried*
26125130	Ocean perch, coated, baked or broiled, fat added in cooking*
26125140	Ocean perch, coated, fried*
26127110	Perch, cooked, NS as to cooking method*
26127140	Perch, coated, fried, made with oil*
26127141	Perch, coated, fried, made with butter*
26131140	Pompano, coated, fried*
26133130	Porgy, coated, baked or broiled, fat added in cooking*
26133140	Porgy, coated, fried*
26137130	Salmon, coated, baked or broiled, made with oil*
26137131	Salmon, coated, baked or broiled, made with butter*
26137133	Salmon, coated, baked or broiled, made without fat*
26137134	Salmon, coated, baked or broiled, made with cooking spray*
26137140	Salmon, coated, fried, made with oil*
26137143	Salmon, coated, fried, made without fat*
26141140	Sea bass, coated, fried*
26149130	Swordfish, coated, baked or broiled, fat added in cooking*
26151130	Trout, coated, baked or broiled, made with oil*
26151133	Trout, coated, baked or broiled, made without fat*
26151140	Trout, coated, fried, made with oil*

Food code	Food description
26151142	Trout, coated, fried, made with margarine*
26153130	Tuna, fresh, coated, baked or broiled, fat added in cooking*
26157110	Whiting, cooked, NS as to cooking method*
26157133	Whiting, coated, baked or broiled, made without fat*
26157140	Whiting, coated, fried, made with oil*
26158020	Tilapia, coated, baked or broiled, made with oil*
26158021	Tilapia, coated, baked or broiled, made with butter*
26158023	Tilapia, coated, baked or broiled, made without fat*
26158024	Tilapia, coated, baked or broiled, made with cooking spray*
26158030	Tilapia, coated, fried, made with oil*
26158031	Tilapia, coated, fried, made with butter*
26158032	Tilapia, coated, fried, made with margarine*
26158033	Tilapia, coated, fried, made without fat*
26158034	Tilapia, coated, fried, made with cooking spray*
26203110	Frog legs, NS as to cooking method*
26205110	Octopus, cooked, NS as to cooking method*
26213140	Squid, coated, fried*
26303140	Clams, coated, fried*
26305130	Crab, coated, baked or broiled, fat added in cooking*
26307140	Crab, soft shell, coated, fried*
26309140	Crayfish, coated, fried*
26311140	Lobster, coated, fried*
26315110	Oysters, cooked, NS as to cooking method*
26315140	Oysters, coated, fried*
26315160	Oysters, coated, baked or broiled, fat added in cooking*
26317140	Scallops, coated, fried*
26317160	Scallops, coated, baked or broiled, fat added in cooking*
26319110	Shrimp, cooked, NS as to cooking method*
26319140	Shrimp, coated, fried, made with oil*
26319141	Shrimp, coated, fried, made with butter*
26319142	Shrimp, coated, fried, made with margarine*
26319143	Shrimp, coated, fried, made without fat*
26319145	Shrimp, coated, fried, from fast food / restaurant*
26319160	Shrimp, coated, baked or broiled, made with oil*
26319163	Shrimp, coated, baked or broiled, made without fat*
26319164	Shrimp, coated, baked or broiled, made with cooking spray*
27116300	Beef with sweet and sour sauce*
27120060	Sweet and sour pork*
27135110	Veal parmigiana*
27146100	Sweet and sour chicken or turkey*
27146110	Sweet and sour chicken or turkey, without vegetables*
27146250	Chicken or turkey cordon bleu*
27146300	Chicken or turkey parmigiana*
27146350	Orange chicken*
27146360	Sesame chicken*
27146400	Chicken kiev*
27150170	Sweet and sour shrimp*
27220080	Ham croquette*
27250030	Codfish ball or cake*
27250040	Crab cake*

Food code	Food description
27250050	Fish cake or patty, NS as to fish*
27250070	Salmon cake or patty*
27250160	Tuna cake or patty*
27250400	Shrimp cake or patty*
27445150	General Tso chicken*
27446320	Chicken or turkey, breaded, fried, garden salad with bacon and cheese, chicken and/or turkey, bacon, cheese, lettuce and/or greens, tomato and/or carrots, other vegetables, no dressing*
27520165	Bacon, breaded fried chicken fillet, and tomato club with lettuce and spread*
27520166	Bacon, breaded fried chicken fillet, and tomato club sandwich with cheese, lettuce and spread*
27540140	Chicken fillet, breaded, fried, sandwich*
27540145	Chicken fillet, breaded, fried, sandwich on biscuit*
27540150	Chicken fillet, breaded, fried, sandwich with lettuce, tomato and spread*
27540151	Chicken fillet, breaded, fried, sandwich with cheese, lettuce, tomato and spread*
27540210	Wrap sandwich filled with breaded fried chicken strips, cheese, lettuce, and spread*
27560300	Corn dog, frankfurter or hot dog with cornbread coating*
28140720	Chicken patty, or nuggets, boneless, breaded, potatoes, vegetable, frozen meal*
32110150	Shrimp-egg patty*
58117110	Cornmeal fritter, Puerto Rican style*
58117410	Codfish fritter, Puerto Rican style*
63107410	Banana, batter-dipped, fried*
71905110	Fried ripe plantain, Puerto Rican style*
72202030	Broccoli, batter-dipped and fried*
73304010	Squash fritter or cake*
75409020	Cauliflower, batter-dipped, fried*
75410550	Jalapeno pepper, stuffed with cheese, breaded or battered, fried*
75411020	Corn fritter*
75412010	Eggplant, batter-dipped, fried*
75414030	Mushrooms, batter-dipped, fried*
75414500	Okra, batter-dipped, fried*
75415020	Onion rings, NS as to form, batter-dipped, baked or fried*
75415022	Onion rings, from frozen, batter-dipped, baked or fried*
75418010	Squash, summer, yellow or green, breaded or battered, fried*
75440200	Vegetable tempura*
75440400	Vegetables, dipped in chick-pea flour batter, fried, Pakora*
77250110	Stuffed tannier fritters, Puerto Rican style*
Cereal, RTE	
57000000	Cereal, NFS
57000050	Kashi cereal, NS as to ready to eat or cooked
57000100	Cereal, oat, NFS
57100100	Cereal, ready-to-eat, NFS
57101000	Cereal (Kellogg's All-Bran)
57103000	Cereal (Post Alpha-Bits)
57103020	Alpha-bits with marshmallows
57103100	Cereal (General Mills Cheerios Apple Cinnamon)
57104000	Cereal (Kellogg's Apple Jacks)
57106050	Cereal (Post Great Grains Banana Nut Crunch)
57106060	Cereal (General Mills Cheerios Banana Nut)
57106100	Cereal (General Mills Basic 4)

Food code	Food description
57106250	Cereal (General Mills Kix Berry Berry)
57106260	Cereal (General Mills Cheerios Berry Burst)
57107000	Cereal (General Mills Boo Berry)
57110000	Cereal (Kellogg's All-Bran Bran Buds)
57117000	Cereal (Quaker Cap'n Crunch)
57119000	Cereal (Quaker Cap'n Crunch's Crunchberries)
57120000	Cereal (Quaker Cap'n Crunch's Peanut Butter Crunch)
57123000	Cereal (General Mills Cheerios)
57124000	Chex cereal, NFS
57124030	Cereal (General Mills Chex Chocolate)
57124050	Cereal (General Mills Chex Cinnamon)
57124100	Cereal (General Mills Cheerios Chocolate)
57124200	Cereal, chocolate flavored, frosted, puffed corn
57124300	Cereal (General Mills Lucky Charms Chocolate)
57124900	Cereal (Kellogg's Cinnabon)
57125000	Cereal (General Mills Cinnamon Toast Crunch)
57125010	Cereal (General Mills 25% Less Sugar Cinnamon Toast Crunch)
57125900	Cereal (General Mills Honey Nut Clusters)
57126000	Cereal (Kellogg's Cocoa Krispies)
57127000	Cereal (Post Cocoa Pebbles)
57128000	Cereal (General Mills Cocoa Puffs)
57128005	Cereal (General Mills 25% Less Sugar Cocoa Puffs)
57130000	Cereal (General Mills Cookie Crisp)
57131000	Cereal (Quaker Corn Bran Crunch)
57132000	Cereal (General Mills Chex Corn)
57134000	Cereal, corn flakes
57135000	Cereal (Kellogg's Corn Flakes)
57137000	Cereal, corn puffs
57139000	Cereal (General Mills Count Chocula)
57143000	Cereal (Kellogg's Cracklin' Oat Bran)
57143500	Cereal (Post Great Grains, Cranberry Almond Crunch)
57148000	Cereal (Kellogg's Crispix)
57148500	Cereal, crispy brown rice
57151000	Cereal, crispy rice
57201900	Cereal (General Mills Dora The Explorer)
57206700	Cereal (General Mills Fiber One)
57206705	Cereal (General Mills Fiber One Caramel Delight)
57206710	Cereal (General Mills Fiber One Honey Clusters)
57206715	Cereal (General Mills Fiber One Raisin Bran Clusters)
57207000	Cereal, bran flakes
57208000	Cereal (Kellogg's All-Bran Complete Wheat Flakes)
57209000	Cereal (Post Bran Flakes)
57211000	Cereal (General Mills Frankenberry)
57213000	Cereal (Kellogg's Froot Loops)
57213010	Cereal (Kellogg's Froot Loops Marshmallow)
57213850	Cereal (General Mills Cheerios Frosted)
57214000	Cereal (Kellogg's Frosted Mini-Wheats)
57214100	Frosted Wheat Bites
57215000	Frosty O's
57216000	Cereal, frosted rice

Food code	Food description
57218000	Cereal (Kellogg's Frosted Krispies)
57219000	Cereal, fruit and fiber
57221700	Cereal, fruit rings
57221800	Cereal, fruit whirls
57221810	Cereal (General Mills Cheerios Fruity)
57223000	Cereal (Post Fruity Pebbles)
57224000	Cereal (General Mills Golden Grahams)
57227000	Cereal, granola
57228000	Granola, homemade
57229000	Cereal (Kellogg's Low Fat Granola)
57229500	Cereal (Kellogg's Low Fat Granola with Raisins)
57230000	Cereal (Post Grape-Nuts)
57231000	Cereal (Post Grape-Nuts Flakes)
57231200	Cereal (Post Great Grains Raisins, Dates, and Pecans)
57231250	Cereal (Post Great Grains Double Pecan Whole Grain Cereal)
57237100	Cereal (Post Honey Bunches of Oats Honey Roasted)
57237200	Cereal (Post Honey Bunches of Oats with Vanilla Bunches)
57237300	Cereal (Post Honey Bunches of Oats with Almonds)
57237900	Cereal (Post Honey Bunches of Oats Just Bunches)
57238000	Cereal (Post Honeycomb)
57239000	Honeycomb, strawberry
57239100	Cereal (Kellogg's Honey Crunch Corn Flakes)
57240100	Cereal (General Mills Chex Honey Nut)
57241000	Cereal (General Mills Cheerios Honey Nut)
57241200	Cereal (Post Shredded Wheat Honey Nut)
57243000	Cereal (Kellogg's Honey Smacks)
57301500	Cereal (Kashi 7 Whole Grain Puffs)
57301505	Cereal (Kashi Autumn Wheat)
57301510	Cereal (Kashi GOLEAN)
57301511	Cereal (Kashi GOLEAN Crunch)
57301512	Cereal (Kashi GOLEAN Crunch Honey Almond Flax)
57301520	Cereal (Kashi Good Friends)
57301530	Cereal (Kashi Heart to Heart Honey Toasted Oat)
57301535	Cereal (Kashi Heart to Heart Oat Flakes and Blueberry Clusters)
57303100	Cereal (General Mills Kix)
57303105	Cereal (General Mills Honey Kix)
57303200	Cereal (Kellogg's Krave)
57304100	Cereal (Quaker Life)
57305100	Cereal (General Mills Lucky Charms)
57305150	Cereal, frosted oat cereal with marshmallows
57305165	Cereal (Malt-O-Meal Cinnamon Toasters)
57305170	Cereal (Malt-O-Meal Coco-Roos)
57305174	Cereal (Malt-O-Meal Colossal Crunch)
57305175	Cereal (Malt-O-Meal Cocoa Dyno-Bites)
57305180	Cereal (Malt-O-Meal Corn Bursts)
57305200	Cereal (Malt-O-Meal Crispy Rice)
57305210	Cereal (Malt-O-Meal Frosted Flakes)
57305215	Cereal (Malt-O-Meal Frosted Mini Spooners)
57305300	Cereal (Malt-O-Meal Fruity Dyno-Bites)
57305400	Cereal (Malt-O-Meal Honey Graham Squares)

Food code	Food description
57305500	Cereal (Malt-O-Meal Honey Nut Toasty O's)
57305600	Cereal (Malt-O-Meal Marshmallow Mateys)
57306100	Malt-O-Meal Puffed Rice
57306120	Malt-O-Meal Puffed Wheat
57306130	Cereal (Malt-O-Meal Raisin Bran)
57306500	Cereal (Malt-O-Meal Golden Puffs)
57306700	Cereal (Malt-O-Meal Toasted Oat Cereal)
57306800	Cereal (Malt-O-Meal Tootie Fruities)
57307010	Cereal (Post Maple Pecan Crunch)
57307500	Cereal, millet, puffed
57308150	Mueslix cereal, NFS
57308190	Cereal, muesli
57308400	Cereal (General Mills Cheerios Multigrain)
57309100	Cereal (Nature Valley Granola)
57316300	Cereal (Health Valley Oat Bran Flakes)
57316380	Cereal (General Mills Cheerios Oat Cluster Crunch)
57316385	Cereal (General Mills Cheerios Protein)
57316450	Cereal (General Mills Oatmeal Crisp with Almonds)
57316710	Cereal (Quaker Honey Graham Oh's)
57320500	Cereal (Quaker Granola with Oats, Honey, and Raisins)
57321900	Cereal (Nature's Path Organic Flax Plus)
57321905	Organic Flax Plus, Pumpkin Granola, Nature's Path
57326000	Cereal (Barbara's Puffins)
57327450	Cereal (Quaker Toasted Oat Bran)
57327500	Cereal (Quaker Oatmeal Squares)
57329000	Cereal, raisin bran
57330000	Cereal (Kellogg's Raisin Bran)
57330010	Cereal (Kellogg's Raisin Bran Crunch)
57331000	Cereal (Post Raisin Bran)
57332050	Cereal (General Mills Total Raisin Bran)
57332100	Cereal (General Mills Raisin Nut Bran)
57335550	Cereal (General Mills Reese's Puffs)
57336000	Cereal (General Mills Chex Rice)
57337000	Cereal, rice flakes
57339000	Cereal (Kellogg's Rice Krispies)
57339500	Cereal (Kellogg's Rice Krispies Treats Cereal)
57340000	Cereal, puffed rice
57341000	Cereal (Post Shredded Wheat'n Bran)
57341200	Cereal (Kellogg's Smart Start Strong)
57344000	Cereal (Kellogg's Special K)
57344001	Cereal (Kellogg's Special K Blueberry)
57344005	Cereal (Kellogg's Special K Chocolatey Delight)
57344007	Cereal (Kellogg's Special K Low Fat Granola)
57344010	Cereal (Kellogg's Special K Red Berries)
57344015	Cereal (Kellogg's Special K Fruit & Yogurt)
57344020	Cereal (Kellogg's Special K Vanilla Almond)
57344025	Cereal (Kellogg's Special K Cinnamon Pecan)
57347000	Cereal (Kellogg's Corn Pops)
57348000	Cereal, frosted corn flakes
57349000	Cereal (Kellogg's Frosted Flakes)

Food code	Food description
57349020	Cereal (Kellogg's Frosted Flakes, Reduced Sugar)
57355000	Cereal (Post Golden Crisp)
57401100	Cereal, toasted oat
57406100	Cereal (General Mills Total)
57407100	Cereal (General Mills Trix)
57407110	Cereal (General Mills 25% Less Sugar Trix)
57410000	Cereal (Weetabix Whole Grain)
57411000	Cereal (General Mills Chex Wheat)
57416000	Cereal, puffed wheat, plain
57416010	Cereal, puffed wheat, sweetened
57417000	Cereal (Post Shredded Wheat)
57418000	Cereal (General Mills Wheaties)
57419000	Cereal (General Mills Cheerios Yogurt Burst)
Dairy analog products	
12200100	Coffee creamer, NFS
12210100	Cream substitute, frozen
12210200	Coffee creamer, liquid
12210210	Coffee creamer, liquid, flavored
12210250	Cream substitute, light, liquid
12210255	Cream substitute, light, flavored, liquid
12210260	Coffee creamer, liquid, fat free
12210270	Coffee creamer, liquid, fat free, flavored*
12210280	Coffee creamer, liquid, fat free, sugar free, flavored
12210310	Coffee creamer, liquid, sugar free, flavored
12210400	Coffee creamer, powder
12210410	Cream substitute, light, powdered
12210420	Coffee creamer, powder, flavored
12210430	Coffee creamer, powder, fat free
12210440	Coffee creamer,powder, fat free, flavored
12210505	Coffee creamer,powder, sugar free, flavored
12210520	Coffee creamer, soy, liquid
12220100	Whipped topping, nondairy, pressurized can
12220200	Whipped topping
12220300	Whipped cream substitute, nondairy, made from powdered mix
12320100	Sour cream, imitation
14502000	Imitation cheese
14640050	Cheese sandwich, American cheese, on white bread, with butter*
14640054	Cheese sandwich, American cheese, on whole wheat bread, with butter*
14640056	Cheese sandwich, Cheddar cheese, on white bread, with butter*
14640060	Cheese sandwich, Cheddar cheese, on whole wheat bread, with butter*
14640062	Cheese sandwich, reduced fat American cheese, on white bread, with butter*
14640100	Grilled cheese sandwich, NFS*
14640105	Grilled cheese sandwich, American cheese, on white bread*
14640110	Grilled cheese sandwich, American cheese, on wheat bread*
14640115	Grilled cheese sandwich, American cheese, on whole wheat bread*
14640125	Grilled cheese sandwich, Cheddar cheese, on white bread*
14640130	Grilled cheese sandwich, Cheddar cheese, on wheat bread*
14640135	Grilled cheese sandwich, Cheddar cheese, on whole wheat bread*
14640155	Grilled cheese sandwich, reduced fat American cheese, on white bread*
14640165	Grilled cheese sandwich, reduced fat American cheese, on whole wheat bread*

Food code	Food description
14640185	Grilled cheese sandwich, reduced fat Cheddar cheese, on white bread*
14640190	Grilled cheese sandwich, reduced fat Cheddar cheese, on wheat bread*
14640195	Grilled cheese sandwich, reduced fat Cheddar cheese, on whole wheat bread*
24168000	Chicken "wings" with hot sauce, from fast food / restaurant*
24168010	Chicken "wings" with hot sauce, from precooked*
24168020	Chicken "wings" with hot sauce, from other sources*
24168030	Chicken "wings", boneless, with hot sauce, from fast food / restaurant*
24168031	Chicken "wings", boneless, with hot sauce, from other sources*
26100122	Fish, NS as to type, baked or broiled, made with margarine*
26100142	Fish, NS as to type, coated, fried, made with margarine*
26115132	Flounder, coated, baked or broiled, made with margarine*
26137122	Salmon, baked or broiled, made with margarine*
26151122	Trout, baked or broiled, made with margarine*
26151142	Trout, coated, fried, made with margarine*
26158012	Tilapia, baked or broiled, made with margarine*
26158032	Tilapia, coated, fried, made with margarine*
26319122	Shrimp, baked or broiled, made with margarine*
26319142	Shrimp, coated, fried, made with margarine*
31105005	Egg, whole, fried, NS as to fat added in cooking*
31105085	Egg, whole, fried, NS as to type of fat*
31108100	Egg, white, cooked, NS as to fat added in cooking*
31108120	Egg, white, cooked, fat added in cooking*
32129990	Egg omelet or scrambled egg, NS as to fat added in cooking*
32130065	Egg omelet or scrambled egg, NS as to type of fat*
32130190	Egg omelet or scrambled egg, with meat, NS as to fat added in cooking*
32130265	Egg omelet or scrambled egg, with meat, NS as to type of fat*
32130290	Egg omelet or scrambled egg, with cheese and meat, NS as to fat added in cooking*
32400055	Egg white omelet, scrambled, or fried, NS as to fat added in cooking*
32400078	Egg white omelet, scrambled, or fried, NS as to type of fat*
33000990	Egg substitute, omelet, scrambled, or fried, NS as to fat added in cooking*
41101113	White beans, dry, cooked, made with margarine*
41102013	Black, brown, or Bayo beans, dry, cooked, made with margarine*
41103013	Lima beans, dry, cooked, made with margarine*
41104013	Pinto, calico, or red Mexican beans, dry, cooked, made with margarine*
41106013	Red kidney beans, dry, cooked, made with margarine*
41205013	Refried beans, made with margarine*
41303013	Green or yellow split peas, dry, cooked, made with margarine*
53244020	Cookie, butter or sugar, with icing or filling other than chocolate*
53366000	Pie, yogurt, frozen*
54403040	Popcorn, air-popped, with added butter or margarine*
54403046	Popcorn, popped in oil, with added butter or margarine*
55100005	Pancakes, NFS*
55100015	Pancakes, plain, reduced fat, from fozen*
55100050	Pancakes, plain, from fast food / restaurant*
55100055	Pancakes, with fruit, from fast food / restaurant*
55100060	Pancakes, with chocolate, from fast food / restaurant*
55100065	Pancakes, whole grain, from fast food / restaurant*
55101000	Pancakes, plain*
55101015	Pancakes, plain, reduced fat*
55103000	Pancakes, with fruit*

Food code	Food description
55103020	Pancakes, pumpkin*
55103100	Pancakes, with chocolate*
55105000	Pancakes, buckwheat*
55105200	Pancakes, whole grain*
55105205	Pancakes, whole grain, reduced fat*
55200100	Waffle, plain, from fast food / restaurant*
55200110	Waffle, chocolate, from fast food / restaurant*
55200120	Waffle, fruit, from fast food / restaurant*
55200130	Waffle, whole grain, from fast food / restaurant*
55201000	Waffle, plain*
55203000	Waffle, fruit*
55203600	Waffle, chocolate*
55203700	Waffle, cinnamon*
55205000	Waffle, whole grain*
55211050	Waffle, plain, reduced fat*
55212000	Waffle, whole grain, reduced fat*
55300010	French toast, NFS*
55300050	French toast, plain, from fast food / restaurant*
55301000	French toast, plain*
55301015	French toast, whole grain*
55301055	French toast sticks, whole grain*
56200510	Buckwheat groats, fat added in cooking*
56200990	Grits, NS as to regular, quick, or instant, NS as to fat added in cooking*
56201020	Grits, cooked, corn or hominy, regular, fat added in cooking*
56201040	Grits, NS as to regular, quick, or instant, fat added in cooking*
56201050	Grits, regular or quick, made with water, NS as to fat added in cooking*
56201052	Grits, regular or quick, made with water, fat added in cooking*
56201055	Grits, regular or quick, made with milk, NS as to fat added in cooking*
56201057	Grits, regular or quick, made with milk, fat added in cooking*
56201072	Grits, cooked, corn or hominy, with cheese, regular, fat added in cooking*
56201082	Grits, cooked, corn or hominy, with cheese, quick, fat added in cooking*
56201090	Grits, with cheese, NS as to fat added in cooking*
56201092	Grits, with cheese, fat added in cooking*
56201120	Grits, cooked, corn or hominy, quick, fat added in cooking*
56201220	Grits, instant, made with water, fat added in cooking*
56201230	Grits, instant, made with water, NS as to fat added in cooking*
56201320	Grits, cooked, corn or hominy, regular, made with milk, fat added in cooking*
56201324	Grits, cooked, corn or hominy, regular, made with milk, NS as to fat added in cooking*
56201330	Grits, cooked, corn or hominy, quick, made with milk, fat added in cooking*
56201340	Grits, instant, made with milk, fat added in cooking*
56201515	Cornmeal mush, NS as to fat added in cooking*
56201517	Cornmeal mush, fat added in cooking*
56202100	Millet, fat added in cooking*
56202960	Oatmeal, NS as to regular, quick, or instant, NS as to fat added in cooking*
56203040	Oatmeal, NS as to regular, quick, or instant, fat added in cooking*
56203050	Oatmeal, cooked, regular, fat added in cooking*
56203055	Oatmeal, regular or quick, made with water, NS as to fat added in cooking*
56203057	Oatmeal, regular or quick, made with water, fat added in cooking*
56203060	Oatmeal, cooked, quick (1 or 3 minutes), fat added in cooking*
56203067	Oatmeal, regular or quick, made with milk, fat added in cooking*

Food code	Food description
56203070	Oatmeal, cooked, instant, fat added in cooking*
56203077	Oatmeal, regular or quick, made with non-dairy milk, fat added in cooking*
56203087	Oatmeal, instant, plain, made with water, fat added in cooking*
56203097	Oatmeal, instant, plain, made with milk, fat added in cooking*
56203125	Oatmeal, instant, maple flavored, NS as to fat added in cooking*
56203135	Oatmeal, instant, maple flavored, fat added in cooking*
56203150	Oatmeal, instant, fruit flavored, NS as to fat added in cooking*
56203160	Oatmeal, instant, fruit flavored, fat added in cooking*
56203180	Oatmeal, instant, other flavors, fat added in cooking*
56203220	Oatmeal, NS as to regular, quick, or instant, made with milk, fat added in cooking*
56203221	Oatmeal, cooked, regular, made with milk, fat added in cooking*
56203222	Oatmeal, cooked, quick (1 or 3 minutes), made with milk, fat added in cooking*
56203223	Oatmeal, cooked, instant, made with milk, fat added in cooking*
56203560	Oatmeal, reduced sugar, flavored, fat added in cooking*
56203600	Oatmeal, multigrain, NS as to fat added in cooking*
56203620	Oatmeal, multigrain, fat added in cooking*
56204000	Quinoa, NS as to fat added in cooking*
56204010	Quinoa, fat added in cooking*
56205006	Rice, white, cooked, fat added in cooking, made with margarine*
56205007	Rice, white, cooked, fat added in cooking, NS as to type of fat*
56205016	Rice, brown, cooked, fat added in cooking, made with margarine*
56205090	Rice, cream of, cooked, fat added in cooking*
56205094	Rice, cream of, cooked, made with milk*
56205230	Rice dessert bar, frozen, flavors other than chocolate, nondairy, carob covered
56206990	Cream of wheat, NS as to regular, quick, or instant, NS as to fat added in cooking*
56207005	Cream of wheat, NS as to regular, quick, or instant, fat added in cooking*
56207017	Cream of wheat, regular or quick, made with water, fat added in cooking*
56207023	Cream of wheat, regular or quick, made with milk, fat added in cooking*
56207027	Cream of wheat, regular or quick, made with non-dairy milk, fat added in cooking*
56207060	Cream of wheat, instant, made with water, fat added in cooking*
56207086	Wheat, cream of, cooked, regular, made with milk, fat added in cooking*
56207094	Cream of wheat, instant, made with milk, fat added in cooking*
56207120	Bulgur, fat added in cooking*
56207190	Whole wheat cereal, cooked, NS as to fat added in cooking*
56207210	Whole wheat cereal, cooked, fat added in cooking*
56207220	Wheat, cream of, cooked, regular, fat added in cooking*
56207330	Whole wheat cereal, wheat and barley, cooked, fat added in cooking*
56208510	Oat bran cereal, cooked, fat added in cooking*
58145135	Macaroni or noodles with cheese and meat*
58145140	Macaroni or noodles with cheese and tomato*
58145160	Macaroni or noodles with cheese and frankfurters or hot dogs*
58145170	Macaroni or noodles with cheese and egg*
58145190	Macaroni or noodles with cheese and chicken or turkey*
63101500	Apple, fried*
63402970	Fruit salad, excluding citrus fruits, with nondairy whipped topping*
63403030	Fruit salad, including citrus fruits, with nondairy whipped topping*
63403100	Fruit dessert with cream and/or pudding and nuts*
63420110	Fruit juice bar, frozen, flavor other than orange
63430100	Sorbet, fruit, noncitrus flavor
63430500	Fruit juice bar with cream, frozen

Food code	Food description
71000100	Potato, NFS*
71101100	White potato, baked, peel eaten, NS as to fat added in cooking*
71101120	White potato, baked, peel eaten, fat added in cooking*
71102980	Potato, boiled, NFS*
71102990	Potato, boiled, ready-to-heat*
71103000	Potato, boiled, from fresh, peel not eaten, NS as to fat added in cooking*
71103020	Potato, boiled, from fresh, peel not eaten, fat added in cooking, NS as to type of fat*
71103050	Potato, boiled, from fresh, peel not eaten, made with margarine*
71103100	White potato, boiled with peel, peel not eaten, NS as to fat added in cooking*
71103105	Potato, boiled, from fresh, peel eaten, NS as to fat added in cooking*
71103115	Potato, boiled, from fresh, peel eaten, fat added in cooking, NS as to type of fat*
71103150	Potato, boiled, from fresh, peel eaten, made with margarine*
71103310	Potato, canned, fat added in cooking, NS as to type of fat*
71104030	Potato, roasted, NFS*
71104040	Potato, roasted, from fresh, peel eaten, NS as to fat added in cooking*
71104090	Potato, roasted, from fresh, peel eaten, made with margarine*
71104150	Potato, roasted, from fresh, peel not eaten, made with margarine*
71104200	Potato, roasted, ready-to-heat*
71301020	White potato, cooked, with cheese*
71301120	White potato, cooked, with ham and cheese*
71305015	Potato, scalloped, NFS*
71305020	Potato, scalloped, from fast food or restaurant*
71305030	Potato, scalloped, from fresh*
71305040	Potato, scalloped, from fresh, with meat*
71305070	Potato, scalloped, ready-to-heat*
71501000	Potato, mashed, NFS*
71501010	Potato, mashed, from fresh, made with milk*
71501011	Potato, mashed, from fresh, made with milk, with cheese*
71501012	Potato, mashed, from fresh, made with milk, with gravy*
71501013	Potato, mashed, from fresh, NFS*
71501016	Potato, mashed, from restaurant*
71501017	Potato, mashed, from restaurant, with gravy*
71501018	Potato, mashed, from school lunch*
71501020	White potato, from fresh, mashed, made with milk and fat*
71501025	White potato, from fresh, mashed, made with milk, and sour cream and/or cream cheese and fat*
71501030	White potato, from fresh, mashed, made with fat*
71501050	White potato, from fresh, mashed, made with milk, fat and cheese*
71501055	White potato, from fresh, mashed, made with sour cream and/or cream cheese and fat*
71501310	White potato, from fresh, mashed, NS as to milk or fat*
71507040	White potato, stuffed, baked, peel not eaten, stuffed with broccoli and cheese sauce*
71507050	White potato, stuffed, baked, peel not eaten, stuffed with meat in cream sauce*
71508050	White potato, stuffed, baked, peel eaten, stuffed with meat in cream sauce*
71930090	Cassava, cooked, NS as to fat added in cooking*
71930120	Cassava, cooked, fat added in cooking, NS as to type of fat*
72101200	Beet greens, cooked, NS as to fat added in cooking*
72103060	Broccoli raab, cooked, made with margarine*
72107200	Collards, cooked, NS as to form, NS as to fat added in cooking*
72107201	Collards, cooked, from fresh, NS as to fat added in cooking*
72107202	Collards, cooked, from frozen, NS as to fat added in cooking*

Food code	Food description
72107203	Collards, cooked, from canned, NS as to fat added in cooking*
72107220	Collards, cooked, NS as to form, fat added in cooking, NS as to type of fat*
72107223	Collards, cooked, from canned, fat added in cooking, NS as to type of fat*
72118200	Greens, cooked, NS as to form, NS as to fat added in cooking*
72118201	Greens, cooked, from fresh, NS as to fat added in cooking*
72119200	Kale, cooked, NS as to form, NS as to fat added in cooking*
72119201	Kale, cooked, from fresh, NS as to fat added in cooking*
72122200	Mustard greens, cooked, NS as to form, NS as to fat added in cooking*
72122201	Mustard greens, cooked, from fresh, NS as to fat added in cooking*
72122203	Mustard greens, cooked, from canned, NS as to fat added in cooking*
72122229	Mustard greens, cooked, from fresh, made with margarine*
72125200	Spinach, cooked, NS as to form, NS as to fat added in cooking*
72125201	Spinach, cooked, from fresh, NS as to fat added in cooking*
72125214	Spinach, cooked, NS as to form, made with oil*
72125219	Spinach, cooked, from fresh, made with margarine*
72125220	Spinach, cooked, NS as to form, fat added in cooking, NS as to type of fat*
72125226	Spinach, cooked, from frozen, made with margarine*
72125229	Spinach, cooked, from canned, made with margarine*
72126001	Taro leaves, cooked, fat added in cooking*
72128200	Turnip greens, cooked, NS as to form, NS as to fat added in cooking*
72128203	Turnip greens, cooked, from canned, NS as to fat added in cooking*
72128221	Turnip greens, cooked, from fresh, fat added in cooking, NS as to type of fat*
72130199	Watercress, cooked, NS as to fat added in cooking*
72132199	Bitter melon leaves, horseradish leaves, jute leaves, or radish leaves, cooked, NS as to fat added in cooking*
72133199	Sweet potato leaves, squash leaves, pumpkin leaves, chrysanthemum leaves, bean leaves, or swamp cabbage, cooked, NS as to fat added in cooking*
72133201	Sweet potato leaves, squash leaves, pumpkin leaves, chrysanthemum leaves, bean leaves, or swamp cabbage, cooked, fat added in cooking*
72201200	Broccoli, cooked, NS as to form, NS as to fat added in cooking*
72201201	Broccoli, cooked, from fresh, NS as to fat added in cooking*
72201202	Broccoli, cooked, from frozen, NS as to fat added in cooking*
72201220	Broccoli, cooked, NS as to form, fat added in cooking, NS as to type of fat*
72201221	Broccoli, cooked, from fresh, fat added in cooking, NS as to type of fat*
72201222	Broccoli, cooked, from frozen, fat added in cooking, NS as to type of fat*
72201225	Broccoli, cooked, from fresh, made with margarine*
72201228	Broccoli, cooked, from frozen, made with margarine*
72203010	Broccoli, chinese, cooked, NS as to form, NS as to fat added in cooking*
73102200	Carrots, cooked, NS as to form, NS as to fat added in cooking*
73102201	Carrots, cooked, from fresh, NS as to fat added in cooking*
73102202	Carrots, cooked, from frozen, NS as to fat added in cooking*
73102219	Carrots, cooked, from fresh, made with margarine*
73102220	Carrots, cooked, NS as to form, fat added in cooking, NS as to type of fat*
73102221	Carrots, cooked, from fresh, fat added in cooking, NS as to type of fat*
73102226	Carrots, cooked, from frozen, made with margarine*
73102229	Carrots, cooked, from canned, made with margarine*
73103000	Carrots, canned, low sodium, NS as to fat added in cooking*
73103023	Carrots, canned, low sodium, made with margarine*
73111200	Peas and carrots, cooked, NS as to form, NS as to fat added in cooking*
73111203	Peas and carrots, cooked, from canned, NS as to fat added in cooking*

Food code	Food description
73111232	Peas and carrots, cooked, from frozen, made with margarine*
73111235	Peas and carrots, cooked, from canned, made with margarine*
73201000	Pumpkin, cooked, NS as to form, NS as to fat added in cooking*
73201020	Pumpkin, cooked, NS as to form, fat added in cooking, NS as to type of fat*
73210010	Calabaza, cooked*
73301000	Squash, winter type, mashed, NS as to fat or sugar added in cooking*
73303000	Squash, winter type, baked, NS as to fat or sugar added in cooking*
73305010	Squash, winter, baked with cheese*
73401000	Sweet potato, NFS*
73402000	Sweet potato, baked, peel eaten, NS as to fat added in cooking*
73402023	Sweet potato, baked, peel eaten, made with margarine*
73403000	Sweet potato, baked, peel not eaten, NS as to fat added in cooking*
73403023	Sweet potato, baked, peel not eaten, made with margarine*
73405000	Sweet potato, boiled, NS as to fat added in cooking*
73405020	Sweet potato, boiled, fat added in cooking, NS as to type of fat*
73405023	Sweet potato, boiled, made with margarine*
73406000	Sweet potato, candied*
73407000	Sweet potato, canned, NS as to fat added in cooking*
73407060	Sweet potato, canned, fat added in cooking*
74504000	Tomato and okra, cooked, NS as to fat added in cooking*
74504020	Tomato and okra, cooked, fat added in cooking, NS as to type of fat*
74504100	Tomato and onion, cooked, NS as to fat added in cooking*
74504120	Tomato and onion, cooked, fat added in cooking, NS as to type of fat*
75200100	Vegetables, NS as to type, cooked, NS as to fat added in cooking*
75200120	Vegetables, NS as to type, cooked, fat added in cooking, NS as to type of fat*
75201000	Artichoke, cooked, NS as to form, NS as to fat added in cooking*
75202000	Asparagus, cooked, NS as to form, NS as to fat added in cooking*
75202001	Asparagus, cooked, from fresh, NS as to fat added in cooking*
75202020	Asparagus, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75202021	Asparagus, cooked, from fresh, fat added in cooking, NS as to type of fat*
75202023	Asparagus, cooked, from canned, fat added in cooking, NS as to type of fat*
75202026	Asparagus, cooked, NS as to form, made with margarine*
75202029	Asparagus, cooked, from fresh, made with margarine*
75202036	Asparagus, cooked, from canned, made with margarine*
75204000	Beans, lima, immature, cooked, NS as to form, NS as to fat added in cooking*
75204002	Beans, lima, immature, cooked, from frozen, NS as to fat added in cooking*
75204003	Beans, lima, immature, cooked, from canned, NS as to fat added in cooking*
75204023	Beans, lima, immature, cooked, from canned, fat added in cooking, NS as to type of fat*
75204032	Beans, lima, immature, cooked, from frozen, made with margarine*
75204962	Beans, string, cooked, NS as to form, NS as to color, made with margarine*
75204965	Beans, string, cooked, from fresh, NS as to color, made with margarine*
75204971	Beans, string, cooked, from canned, NS as to color, made with margarine*
75204980	Beans, string, cooked, NS as to form, NS as to color, fat added in cooking, NS as to type of fat*
75204981	Beans, string, cooked, from fresh, NS as to color, fat added in cooking, NS as to type of fat*
75204982	Beans, string, cooked, from frozen, NS as to color, fat added in cooking, NS as to type of fat*
75205000	Beans, string, cooked, NS as to form, NS as to color, NS as to fat added in cooking*
75205001	Beans, string, cooked, from fresh, NS as to color, NS as to fat added in cooking*
75205003	Beans, string, cooked, from canned, NS as to color, NS as to fat added in cooking*

Food code	Food description
75205010	Beans, string, green, cooked, NS as to form, NS as to fat added in cooking*
75205011	Beans, string, green, cooked, from fresh, NS as to fat added in cooking*
75205012	Beans, string, green, cooked, from frozen, NS as to fat added in cooking*
75205013	Beans, string, green, cooked, from canned, NS as to fat added in cooking*
75205030	Beans, string, green, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75205031	Beans, string, green, cooked, from fresh, fat added in cooking, NS as to type of fat*
75205032	Beans, string, green, cooked, from frozen, fat added in cooking, NS as to type of fat*
75205033	Beans, string, green, cooked, from canned, fat added in cooking, NS as to type of fat*
75205043	Beans, string, green, cooked, NS as to form, made with margarine*
75205046	Beans, string, green, cooked, from fresh, made with margarine*
75205049	Beans, string, green, cooked, from frozen, made with margarine*
75205052	Beans, string, green, cooked, from canned, made with margarine*
75205110	Beans, string, green, canned, low sodium, NS as to fat added in cooking*
75205133	Beans, string, green, canned, low sodium, made with margarine*
75206010	Beans, string, yellow, cooked, NS as to form, fat not added in cooking*
75208000	Beets, cooked, NS as to form, NS as to fat added in cooking*
75208001	Beets, cooked, from fresh, NS as to fat added in cooking*
75209000	Brussels sprouts, cooked, NS as to form, NS as to fat added in cooking*
75209002	Brussels sprouts, cooked, from frozen, NS as to fat added in cooking*
75209021	Brussels sprouts, cooked, from fresh, fat added in cooking, NS as to type of fat*
75209032	Brussels sprouts, cooked, NS as to form, made with margarine*
75209052	Brussels sprouts, cooked, from frozen, made with margarine*
75211010	Cabbage, green, cooked, NS as to fat added in cooking*
75211030	Cabbage, green, cooked, fat added in cooking, NS as to type of fat*
75211033	Cabbage, green, cooked, made with margarine*
75212000	Cabbage, red, cooked, NS as to fat added in cooking*
75213100	Cactus, cooked, NS as to fat added in cooking*
75214000	Cauliflower, cooked, NS as to form, NS as to fat added in cooking*
75214001	Cauliflower, cooked, from fresh, NS as to fat added in cooking*
75214029	Cauliflower, cooked, from fresh, made with margarine*
75214032	Cauliflower, cooked, from frozen, made with margarine*
75215000	Celery, cooked, NS as to fat added in cooking*
75215100	Fennel bulb, cooked, NS as to fat added in cooking*
75215509	Christophine, cooked, NS as to fat added in cooking*
75215511	Christophine, cooked, fat added in cooking*
75216000	Corn, cooked, NS as to form, NS as to color, NS as to fat added in cooking*
75216001	Corn, cooked, from fresh, NS as to color, NS as to fat added in cooking*
75216002	Corn, cooked, from frozen, NS as to color, NS as to fat added in cooking*
75216003	Corn, cooked, from canned, NS as to color, NS as to fat added in cooking*
75216020	Corn, cooked, NS as to form, NS as to color, fat added in cooking, NS as to type of fat*
75216026	Corn, cooked, NS as to form, NS as to color, made with margarine*
75216033	Corn, cooked, from frozen, NS as to color, made with margarine*
75216036	Corn, cooked, from canned, NS as to color, made with margarine*
75216070	Corn, dried, cooked*
75216100	Corn, yellow, cooked, NS as to form, NS as to fat added in cooking*
75216101	Corn, yellow, cooked, from fresh, NS as to fat added in cooking*
75216102	Corn, yellow, cooked, from frozen, NS as to fat added in cooking*
75216103	Corn, yellow, cooked, from canned, NS as to fat added in cooking*
75216120	Corn, yellow, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75216121	Corn, yellow, cooked, from fresh, fat added in cooking, NS as to type of fat*

Food code	Food description
75216122	Corn, yellow, cooked, from frozen, fat added in cooking, NS as to type of fat*
75216123	Corn, yellow, cooked, from canned, fat added in cooking, NS as to type of fat*
75216133	Corn, yellow, cooked, NS as to form, made with margarine*
75216136	Corn, yellow, cooked, from fresh, made with margarine*
75216139	Corn, yellow, cooked, from frozen, made with margarine*
75216143	Corn, yellow, cooked, from canned, made with margarine*
75216163	Corn, yellow and white, cooked, from canned, NS as to fat added in cooking*
75216179	Corn, yellow and white, cooked, from fresh, made with margarine*
75216190	Corn, yellow, NS as to form, cream style, fat added in cooking*
75216193	Corn, yellow, from canned, cream style, fat added in cooking*
75216200	Corn, white, cooked, NS as to form, NS as to fat added in cooking*
75216202	Corn, white, cooked, from frozen, NS as to fat added in cooking*
75216226	Corn, white, cooked, NS as to form, made with margarine*
75216229	Corn, white, cooked, from fresh, made with margarine*
75216300	Corn, yellow, canned, low sodium, NS as to fat added in cooking*
75216323	Corn, yellow, canned, low sodium, made with margarine*
75216700	Cucumber, cooked, NS as to fat added in cooking*
75217000	Eggplant, cooked, NS as to fat added in cooking*
75217020	Eggplant, cooked, fat added in cooking, NS as to type of fat*
75217301	Flowers or blossoms of sesbania, squash, or lily, fat added in cooking*
75217490	Hominy, cooked, NS as to fat added in cooking*
75217520	Hominy, cooked, fat added in cooking*
75218011	Kohlrabi, cooked, fat added in cooking*
75218400	Leek, cooked, NS as to fat added in cooking*
75219000	Mushrooms, cooked, NS as to form, NS as to fat added in cooking*
75219001	Mushrooms, cooked, from fresh, NS as to fat added in cooking*
75219002	Mushrooms, cooked, from frozen, NS as to fat added in cooking*
75219020	Mushrooms, cooked, NS as to form, fat added in cooking, NS asa to type of fat*
75219021	Mushrooms, cooked, from fresh, fat added in cooking, NS as to type of fat*
75219035	Mushrooms, cooked, from fresh, made with margarine*
75219038	Mushrooms, cooked, from frozen, made with margarine*
75220000	Okra, cooked, NS as to form, NS as to fat added in cooking*
75220001	Okra, cooked, from fresh, NS as to fat added in cooking*
75220020	Okra, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75220033	Okra, cooked, from frozen, made with margarine*
75220049	Lettuce, cooked, NS as to fat added in cooking*
75220051	Lettuce, cooked, fat added in cooking*
75221000	Onions, cooked, NS as to form, NS as to fat added in cooking*
75221001	Onions, cooked, from fresh, NS as to fat added in cooking*
75221002	Onions, cooked, from frozen, NS as to fat added in cooking*
75221019	Onions, cooked, from fresh, made with margarine*
75221020	Onions, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75221040	Onions, green, cooked, NS as to form, NS as to fat added in cooking*
75221061	Onions, green, cooked, from fresh, fat added in cooking*
75222000	Parsnips, cooked, NS as to fat added in cooking*
75223003	Peas, cowpeas, field peas, or blackeye peas, not dried, cooked, from canned, NS as to fat added in cooking*
75224010	Peas, green, cooked, NS as to form, NS as to fat added in cooking*
75224011	Peas, green, cooked, from fresh, NS as to fat added in cooking*
75224012	Peas, green, cooked, from frozen, NS as to fat added in cooking*

Food code	Food description
75224013	Peas, green, cooked, from canned, NS as to fat added in cooking*
75224030	Peas, green, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75224048	Peas, green, cooked, from frozen, made with margarine*
75224051	Peas, green, cooked, from canned, made with margarine*
75224133	Peas, green, canned, low sodium, made with margarine*
75225014	Pigeon peas, cooked, NS as to form, NS as to fat added in cooking*
75225015	Pigeon peas, cooked, NS as to form, fat added in cooking*
75226000	Peppers, green, cooked, NS as to fat added in cooking*
75226020	Peppers, green, cooked, fat added in cooking, NS as to type of fat*
75226023	Peppers, green, cooked, made with margarine*
75226040	Peppers, red, cooked, NS as to fat added in cooking*
75226060	Peppers, red, cooked, fat added in cooking, NS as to type of fat*
75226090	Peppers, hot, cooked, NS as to form, NS as to fat added in cooking*
75226091	Peppers, hot, cooked, from fresh, NS as to fat added in cooking*
75226093	Peppers, hot, cooked, from canned, NS as to fat added in cooking*
75226110	Peppers, hot, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75226111	Peppers, hot, cooked, from fresh, fat added in cooking, NS as to type of fat*
75226112	Peppers, hot, cooked, from frozen, fat added in cooking, NS as to type of fat*
75228000	Rutabaga, cooked, NS as to fat added in cooking*
75230000	Sauerkraut, cooked, NS as to fat added in cooking*
75230020	Sauerkraut, cooked, fat added in cooking*
75231025	Snowpea, cooked, NS as to form, made with margarine*
75231031	Snowpea, cooked, from frozen, made with margarine*
75233000	Squash, summer, yellow or green, cooked, NS as to form, NS as to fat added in cooking*
75233001	Squash, summer, yellow or green, cooked, from fresh, NS as to fat added in cooking*
75233020	Squash, summer, yellow or green, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75233029	Squash, summer, yellow or green, cooked, from fresh, made with margarine*
75233223	Squash, spaghetti, cooked, made with margarine*
75234000	Turnip, cooked, NS as to form, NS as to fat added in cooking*
75301123	Beans, lima and corn, cooked, made with margarine*
75302009	Beans, string, green, with tomatoes, cooked, NS as to fat added in cooking*
75302011	Beans, string, green, with tomatoes, cooked, fat added in cooking*
75302200	Beans, string, green, with onions, NS as to fat added in cooking*
75302500	Beans, string, green, and potatoes, cooked, NS as to fat added in cooking*
75302513	Beans, string, green, and potatoes, cooked, made with margarine*
75303000	Corn with peppers, red or green, cooked, NS as to fat added in cooking*
75306999	Green peppers and onions, cooked, NS as to fat added in cooking*
75307000	Green peppers and onions, cooked, fat added in cooking, NS as to type of fat*
75307003	Green peppers and onions, cooked, made with margarine*
75311000	Mixed vegetables, cooked, NS as to form, NS as to fat added in cooking*
75311002	Mixed vegetables, cooked, from frozen, NS as to fat added in cooking*
75311003	Mixed vegetables, cooked, from canned, NS as to fat added in cooking*
75311020	Mixed vegetables, cooked, NS as to form, fat added in cooking, NS as to type of fat*
75311023	Mixed vegetables, cooked, from canned, fat added in cooking, NS as to type of fat*
75311026	Mixed vegetables, cooked, NS as to form, made with margarine*
75311029	Mixed vegetables, cooked, from frozen, made with margarine*
75311032	Mixed vegetables, cooked, from canned, made with margarine*
75311100	Mixed vegetables, canned, low sodium, NS as to fat added in cooking*
75315000	Peas and corn, cooked, NS as to fat added in cooking*

Food code	Food description
75315023	Peas and corn, cooked, made with margarine*
75315200	Peas and mushrooms, cooked, NS as to fat added in cooking*
75315305	Peas and potatoes, cooked, NS as to fat added in cooking*
75315999	Squash, summer, yellow or green, and onions, cooked, NS as to fat added in cooking*
75316024	Squash, summer, yellow or green, and onions, cooked, made with margarine*
75316031	Squash, summer, yellow or green, with tomato sauce, cooked, fat added in cooking*
75316032	Squash, summer, yellow or green, with tomato sauce, cooked, NS as to fat added in cooking*
75317000	Vegetables, stew type, cooked, NS as to fat added in cooking*
75317010	Vegetables, stew type, cooked, fat added in cooking, NS as to type of fat*
75330100	Vegetable combination, including carrots, broccoli, and/or dark-green leafy; cooked, no sauce, NS as to fat added in cooking*
75330123	Vegetable combination, including carrots, broccoli, and/or dark-green leafy; cooked, no sauce, made with margarine*
75330130	Vegetable combination, excluding carrots, broccoli, and dark-green leafy; cooked, no sauce, NS as to fat added in cooking*
75330153	Vegetable combination, excluding carrots, broccoli, and dark-green leafy; cooked, no sauce, made with margarine*
75340000	Vegetable combinations, Asian style, broccoli, green pepper, water chestnut, etc., cooked, NS as to fat added in cooking*
75340020	Vegetable combinations, Asian style, broccoli, green pepper, water chestnut, etc., cooked, fat added in cooking, NS as to type of fat*
75450600	Vegetable combination, including carrots, broccoli, and/or dark-green leafy; cooked, with butter sauce*
75460700	Vegetable combinations, including carrots, broccoli, and/or dark-green leafy; cooked, with pasta*
75460710	Vegetable combinations, excluding carrots, broccoli, and dark-green leafy; cooked, with pasta*
75460810	Vegetable combinations, excluding carrots, broccoli, and dark-green leafy; cooked, with butter sauce and pasta*
81100000	Table fat, NFS*
81102000	Margarine, NFS
81102020	Margarine, tub, salted
81103020	Margarine, whipped, tub, salted
81103040	Margarine-like spread, stick, salted
81103041	Margarine-like spread, made with yogurt, stick, salted
81103060	Margarine, tub, unsalted
81103080	Margarine-like spread, tub, salted
81103090	Margarine-like spread, liquid, salted
81103140	Margarine-like spread, tub, sweetened
81104010	Margarine-like spread, reduced calorie, about 40% fat, tub, salted
81104011	Margarine like spread, reduced calorie, about 40% fat, made with yogurt, tub, salted
81104020	Margarine-like spread, reduced calorie, about 40% fat, stick, salted
81104050	Margarine like spread, reduced calorie, about 20% fat, tub, salted
81104100	Margarine like spread, fat free, tub, salted
81104110	Margarine like spread, fat free, liquid, salted
81104510	Vegetable oil-butter spread, tub, salted
81104560	Vegetable oil-butter spread, reduced calorie, tub, salted
81105020	Butter-margarine blend, tub, salted
81105500	Butter-vegetable oil blend

Food code	Food description
81106010	Butter replacement, fat-free powder
91501030	Gelatin dessert with whipped cream*
91520100	Yokan
91601000	Ice, fruit
91611000	Ice pop
91611100	Ice pop, sweetened with low calorie sweetener
91621000	Snow cone
92121000	Coffee, instant, pre-lightened and pre-sweetened with sugar, reconstituted*
92121001	Coffee, instant, decaffeinated, pre-lightened and pre-sweetened with sugar, reconsitituted*
92121020	Coffee, mocha, instant, pre-lightened and pre-sweetened with sugar, reconstituted*
92121040	Coffee, instant, pre-lightened and pre-sweetened with low calorie sweetener, reconstituted*
92121041	Coffee, instant, decaffeinated, pre-lightened and pre-sweetened with low calorie sweetener, reconstituted*
92130000	Coffee, pre-lightened and pre-sweetened with sugar*
92130001	Coffee, decaffeinated, pre-lightened and pre-sweetened with sugar*
92130010	Coffee, pre-lightened*
92130011	Coffee, decaffeinated, pre-lightened*
92193000	Coffee, instant, pre-lightened and pre-sweetened with sugar, not reconstituted*
Meat analogs & vegetarian food products	
27564420	Frankfurter or hot dog sandwich, meatless, plain, on bun*
27564430	Frankfurter or hot dog sandwich, meatless, plain, on bread*
41422010	Soybean meal
41440000	Textured vegetable protein, dry
41810200	Bacon strip, meatless
41810250	Bacon bits
41810400	Breakfast link, pattie, or slice, meatless
41810600	Chicken, meatless, NFS
41810610	Chicken, meatless, breaded, fried
41811400	Frankfurter or hot dog, meatless
41811600	Luncheon slice, meatless-beef, chicken, salami or turkey
41811800	Meatball, meatless
41811890	Vegetarian burger or patty, meatless, no bun
41812000	Sandwich spread, meat substitute type
41812400	Vegetarian pot pie
41812450	Vegetarian chili, made with meat substitute
41812600	Vegetarian, fillet
41812800	Vegetarian stew
41812850	Vegetarian stroganoff
41812900	Vegetarian meat loaf
41901020	Soyburger, meatless, with cheese on bun*
59003000	Meat substitute, cereal- and vegetable protein-based, fried
75140500	Broccoli salad with cauliflower, cheese, bacon bits, and dressing*
Mixed dishes with sauce	
27111407	Chili con carne with beans, canned
27211190	Beef and potatoes with cream sauce, white sauce or mushroom sauce
27212050	Beef and macaroni with cheese sauce
27212100	Beef and noodles with tomato-based sauce
27212350	Beef stroganoff with noodles
27213500	Beef and rice with soy-based sauce
27213600	Beef and rice with cheese sauce

Food code	Food description
27241010	Chicken or turkey and potatoes with gravy
27243300	Chicken or turkey and rice with cream sauce
27243600	Chicken or turkey and rice with soy-based sauce
27246100	Chicken or turkey with dumplings
27246200	Chicken or turkey with stuffing
27317010	Beef pot pie
27347100	Chicken or turkey pot pie
27350070	Tuna pot pie
27443110	Chicken or turkey a la king with vegetables including carrots, broccoli, and/or dark-green leafy; no potatoes, cream, white, or soup-based sauce
28101000	Frozen dinner, NFS
28110000	Beef dinner, NFS, frozen meal
28110220	Sirloin, chopped, with gravy, mashed potatoes, vegetable, frozen meal
28110270	Sirloin beef, with gravy, potatoes, vegetable, frozen meal
28110310	Salisbury steak with gravy, potatoes, vegetable, frozen meal
28110330	Salisbury steak with gravy, whipped potatoes, vegetable, dessert, frozen meal
28110350	Salisbury steak with gravy, potatoes, vegetable, dessert, frozen meal
28110380	Salisbury steak with gravy, macaroni and cheese, frozen meal
28110390	Salisbury steak, potatoes, vegetable, dessert, diet frozen meal
28110510	Beef, sliced, with gravy, potatoes, vegetable, frozen meal
28110620	Beef short ribs, boneless, with barbecue sauce, potatoes, vegetable, frozen meal
28110660	Meatballs, Swedish, in gravy, with noodles, diet frozen meal
28113140	Beef with spaetzle or rice, vegetable, frozen meal
28140100	Chicken dinner, NFS, frozen meal
28140150	Chicken divan, frozen meal
28140320	Chicken and noodles with vegetable, dessert, frozen meal
28140730	Chicken patty, breaded, with tomato sauce and cheese, fettuccine alfredo, vegetable, frozen meal
28140740	Chicken patty or nuggets, boneless, breaded, with pasta and tomato sauce, fruit, dessert, frozen meal
28141050	Chicken patty parmigiana, breaded, with vegetable, diet frozen meal
28141201	Teriyaki chicken with rice and vegetable, diet frozen meal
28141250	Chicken with rice and vegetable, diet frozen meal
28141610	Chicken and vegetables in cream or white sauce, diet frozen meal
28141650	Chicken and vegetables au gratin with rice, diet frozen entree
28143020	Chicken and vegetable entree with rice, diet frozen meal
28143040	Chicken chow mein with rice, diet frozen meal
28143080	Chicken with noodles and cheese sauce, diet frozen meal
28143110	Chicken cacciatore with noodles, diet frozen meal
28143130	Chicken and vegetable entree with noodles, frozen meal
28143150	Chicken and vegetable entree with noodles, diet frozen meal
28143170	Chicken in cream sauce with noodles and vegetable, frozen meal
28143190	Chicken in mushroom sauce, white and wild rice, vegetable, frozen meal
28143200	Chicken in soy-based sauce, rice and vegetables, frozen meal
28143210	Chicken in orange sauce with almond rice, diet frozen meal
28144100	Chicken and vegetable entree with noodles and cream sauce, frozen meal
28145100	Turkey with gravy, dressing, vegetable and fruit, diet frozen meal
28145210	Turkey with gravy, dressing, potatoes, vegetable, frozen meal
28145610	Turkey with gravy, dressing, potatoes, vegetable, dessert, frozen meal
28145710	Turkey tetrazzini, frozen meal

Food code	Food description
28150510	Fish in lemon-butter sauce with starch item, vegetable, frozen meal
28154010	Shrimp and vegetables in sauce with noodles, diet frozen meal
28160300	Meat loaf dinner, NFS, frozen meal
28160310	Meat loaf with potatoes, vegetable, frozen meal
28160650	Stuffed green pepper, frozen meal
58101800	Ground beef with tomato sauce and taco seasonings on a cornbread crust
58130013	Lasagna with meat, canned
58130016	Lasagna with meat, frozen
58131323	Ravioli, meat-filled, with tomato sauce or meat sauce, canned
58131523	Ravioli, cheese-filled, with tomato sauce, canned
58132113	Pasta with tomato sauce and cheese, canned
58132310	Spaghetti with tomato sauce and meatballs or spaghetti with meat sauce or spaghetti with meat sauce and meatballs
58132313	Pasta with tomato sauce and meat or meatballs, canned
58145110	Macaroni or noodles with cheese
58145112	Macaroni or noodles with cheese, made from packaged mix
58145113	Macaroni or noodles with cheese, canned
58145117	Macaroni or noodles with cheese, Easy Mac type
58145119	Macaroni or noodles with cheese, made from reduced fat packaged mix
58145120	Macaroni or noodles with cheese and tuna
58145136	Macaroni or noodles with cheese and meat, prepared from Hamburger Helper mix
58146323	Pasta with tomato-based sauce and meat, ready-to-heat
58147340	Macaroni or noodles, creamed, with cheese and tuna
58147510	Flavored pasta
58163310	Flavored rice mixture
58163330	Flavored rice mixture with cheese
58163380	Flavored rice and pasta mixture
58301050	Lasagna with cheese and meat sauce, diet frozen meal
58301110	Vegetable lasagna, frozen meal
58301150	Zucchini lasagna, diet frozen meal
58302000	Macaroni and cheese, diet frozen meal
58302050	Beef and noodles with meat sauce and cheese, diet frozen meal
58302080	Noodles with vegetables in tomato-based sauce, diet frozen meal
58303100	Rice, with broccoli, cheese sauce, frozen side dish
58304010	Spaghetti and meatballs dinner, NFS, frozen meal
58304060	Spaghetti with meat sauce, diet frozen meal
58304200	Ravioli, cheese-filled, with tomato sauce, diet frozen meal
58304220	Rigatoni with meat sauce and cheese, diet frozen meal
58305250	Pasta with vegetable and cheese sauce, diet frozen meal
58306070	Cheese enchilada, frozen meal
58306100	Chicken enchilada, diet frozen meal
71305050	Potato, scalloped, from dry mix
71501035	Potato, mashed, from dry mix, NFS
71501040	Potato, mashed, from dry mix, made with milk
71501045	Potato, mashed, from dry mix, made with milk, with cheese
71501054	Potato, mashed, from dry mix, made with milk, with gravy
71501060	White potato, from dry, mashed, made with milk, fat and egg
71501090	White potato, from dry, mashed, made with milk, no fat
71501200	White potato, from complete dry mix, mashed, made with water
71501300	White potato, from dry, mashed, NS as to milk or fat

Food code	Food description
72125232	Spinach, from frozen, creamed
72125253	Spinach, cooked, from canned, with cheese sauce
72201232	Broccoli, cooked, from frozen, with cheese sauce
72201252	Broccoli, cooked, from frozen, with cream sauce
73102233	Carrots, cooked, from canned, creamed
75402012	Beans, lima, immature, from frozen, creamed or with cheese sauce
75403012	Beans, string, green, from frozen, creamed or with cheese sauce
75403013	Beans, string, green, from canned, creamed or with cheese sauce
75403022	Beans, string, green, cooked, from frozen, with mushroom sauce
75403023	Beans, string, green, cooked, from canned, with mushroom sauce
75409012	Cauliflower, from frozen, creamed
75411032	Corn, cooked, from frozen, with cream sauce, made with milk
75411033	Corn, cooked, from canned, with cream sauce, made with milk
75414013	Mushrooms, from canned, creamed
75417012	Peas, from frozen, creamed
75417022	Peas, cooked, from frozen, with mushroom sauce
75417032	Peas, cooked, from frozen, with tomato sauce
Non-dairy beverages	
95103000	Nutritional drink or shake, ready-to-drink (Ensure)
95103010	Nutritional drink or shake, ready-to-drink (Ensure Plus)
95105000	Nutritional drink or shake, ready-to-drink (Kellogg's Special K Protein)
95106000	Nutritional drink or shake, ready-to-drink (Muscle Milk)
95106010	Nutritional drink or shake, ready-to-drink, light (Muscle Milk)
95110020	Nutritional drink or shake, high protein, ready-to-drink (Slim Fast)
95120000	Nutritional drink or shake, ready-to-drink, NFS
95120010	Nutritional drink or shake, high protein, ready-to-drink, NFS
95120020	Nutritional drink or shake, high protein, light, ready-to-drink, NFS
95120050	Nutritional drink or shake, liquid, soy-based
Nut butters (except full-fat peanut butter)	
42200500	Almond butter
42200510	Almond butter, lower sodium
42201000	Cashew butter
42202150	Peanut butter, reduced fat
42301115	Peanut butter sandwich, with reduced fat peanut butter, on white bread*
42301125	Peanut butter sandwich, with reduced fat peanut butter, on whole wheat bread*
42302055	Peanut butter and jelly sandwich, with reduced fat peanut butter, regular jelly, on white bread*
42302060	Peanut butter and jelly sandwich, with reduced fat peanut butter, regular jelly, on wheat bread*
42302065	Peanut butter and jelly sandwich, with reduced fat peanut butter, regular jelly, on whole wheat bread*
42302155	Peanut butter and jelly sandwich, with reduced fat peanut butter, reduced sugar jelly, on white bread*
42302160	Peanut butter and jelly sandwich, with reduced fat peanut butter, reduced sugar jelly, on wheat bread*
42302165	Peanut butter and jelly sandwich, with reduced fat peanut butter, reduced sugar jelly, on whole wheat bread*
Nutritional bars	
53710800	Cereal or granola bar (Kashi Chewy)
53710802	Cereal or granola bar (Kashi Crunchy)

Food code	Food description
53710804	Kashi GOLEAN Crunchy Bars
53710806	Kashi TLC Crunchy Granola Bar
53720100	Nutrition bar (Balance Original Bar)
53720200	Nutrition bar (Clif Bar)
53720210	Nutrition bar (Clif Kids Organic Zbar)
53720300	Nutrition bar (PowerBar)
53720400	Nutrition bar (Slim Fast Original Meal Bar)
53720500	Nutrition bar (Snickers Marathon Protein Bar)
53720600	Nutrition bar (South Beach Living Meal Bar)
53720610	Nutrition bar (South Beach Living High Protein Bar)
53720700	Nutrition bar (Tiger's Milk)
53720800	Nutrition bar (Zone Perfect Classic Crunch)
53729000	Nutrition bar or meal replacement bar, NFS
Pasta, cooked	
27212000	Beef and noodles, no sauce*
27212120	Chili con carne with beans and macaroni*
27212150	Beef goulash with noodles*
27212200	Beef and noodles with gravy*
27212300	Beef and noodles with cream or white sauce*
27212400	Beef and noodles with mushroom sauce*
27212500	Beef and noodles with soy-based sauce*
27220020	Ham and noodles with cream or white sauce*
27220190	Sausage and noodles with cream or white sauce*
27220210	Ham and noodles, no sauce*
27242000	Chicken or turkey and noodles, no sauce*
27242200	Chicken or turkey and noodles with gravy*
27242300	Chicken or turkey and noodles with cream or white sauce*
27242310	Chicken or turkey and noodles with cheese sauce*
27242350	Chicken or turkey tetrazzini*
27242400	Chicken or turkey and noodles with tomato-based sauce*
27242500	Chicken or turkey and noodles with soy-based sauce*
27250110	Scallops and noodles with cheese sauce*
27250120	Shrimp and noodles, no sauce*
27250124	Shrimp and noodles with mushroom sauce*
27250126	Shrimp and noodles with cream or white sauce*
27250128	Shrimp and noodles with soy-based sauce*
27250130	Shrimp and noodles with cheese sauce*
27250132	Shrimp and noodles with tomato sauce*
27250610	Tuna noodle casserole with cream or white sauce*
27250630	Tuna noodle casserole with mushroom sauce*
27313010	Beef, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; no sauce*
27313020	Beef, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; no sauce*
27313110	Beef chow mein or chop suey with noodles*
27313150	Beef, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; soy-based sauce*
27313160	Beef, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; soy-based sauce*
27313210	Beef, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; tomato-based sauce*

Food code	Food description
27313220	Beef, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; tomato-based sauce*
27313410	Beef, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; gravy*
27320025	Ham or pork, noodles and vegetables excluding carrots, broccoli, and dark-green leafy; no sauce*
27320027	Ham or pork, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; no sauce*
27320030	Ham or pork, noodles and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27320080	Sausage, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; tomato-based sauce*
27320090	Sausage, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; tomato-based sauce*
27320310	Pork chow mein or chop suey with noodles*
27343010	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; no sauce*
27343020	Chicken or turkey, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; no sauce*
27343410	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; gravy*
27343470	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27343480	Chicken or turkey, noodles, and vegetables excluding carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27343510	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; tomato-based sauce*
27343520	Chicken or turkey, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; tomato-based sauce*
27343910	Chicken or turkey chow mein or chop suey with noodles*
27343950	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; cheese sauce*
27343960	Chicken or turkey, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27350050	Shrimp chow mein or chop suey with noodles*
27350080	Tuna noodle casserole with vegetables, cream or white sauce*
27350090	Fish, noodles, and vegetables including carrots, broccoli, and/or dark green leafy; cheese sauce*
27360010	Goulash, NFS*
27360120	Chow mein or chop suey, various types of meat, with noodles*
27446350	Asian chicken or turkey garden salad, chicken and/or turkey, lettuce, fruit, nuts, no dressing*
27446355	Asian chicken or turkey garden salad with crispy noodles, chicken and/or turkey, lettuce, fruit, nuts, crispy noodles, no dressing*
28310330	Pho*
28315160	Italian Wedding Soup*
28320140	Ham, noodle, and vegetable soup, Puerto Rican style*
28331110	Lamb, pasta, and vegetable soup, Puerto Rican style*
28340220	Chicken soup with noodles and potatoes, Puerto Rican style*
28340510	Chicken or turkey noodle soup, chunky style, canned or ready-to-serve*
28340590	Chicken or turkey corn soup with noodles, home recipe*
28340700	Bird's nest soup*

Food code	Food description
41425010	Vermicelli, made from soybeans
41601090	Bean soup, with macaroni, home recipe, canned, or ready-to-serve*
55703000	Cake made with glutinous rice and dried beans*
56101000	Macaroni, cooked, NS as to fat added in cooking
56101010	Macaroni, cooked, fat not added in cooking
56101030	Macaroni, cooked, fat added in cooking
56102010	Macaroni, whole wheat, cooked, fat not added in cooking
56102020	Macaroni, whole wheat, cooked, fat added in cooking
56104000	Pasta, vegetable, cooked
56104010	Macaroni, cooked, vegetable, fat not added in cooking
56104020	Macaroni, cooked, vegetable, fat added in cooking
56112000	Noodles, cooked
56112010	Noodles, cooked, fat not added in cooking
56112030	Noodles, cooked, fat added in cooking
56113000	Noodles, whole grain, cooked
56113010	Noodles, cooked, whole wheat, fat not added in cooking
56113990	Noodles, vegetable, cooked
56116990	Long rice noodles, made from mung beans, cooked
56117000	Long rice noodles (made from mung beans), cooked, fat not added in cooking
56117010	Long rice noodles (made from mung beans), cooked, fat added in cooking
56117090	Rice noodles, cooked
56117100	Chow fun rice noodles, cooked, fat not added in cooking
56117110	Chow fun rice noodles, cooked, fat added in cooking
56130000	Pasta, cooked
56130010	Spaghetti, cooked, fat not added in cooking
56131000	Spaghetti, cooked, fat added in cooking
56132990	Pasta, whole grain, cooked
56133000	Spaghetti, cooked, whole wheat, fat not added in cooking
56133010	Spaghetti, cooked, whole wheat, fat added in cooking
56140100	Pasta, gluten free
58130011	Lasagna with meat*
58130015	Lasagna with meat, home recipe*
58130020	Lasagna with meat and spinach*
58130140	Lasagna with chicken or turkey*
58130150	Lasagna, with chicken or turkey, and spinach*
58130310	Lasagna, meatless*
58130320	Lasagna, meatless, with vegetables*
58131100	Ravioli, NS as to filling, no sauce*
58131110	Ravioli, NS as to filling, with tomato sauce*
58131120	Ravioli, NS as to filling, with cream sauce*
58131310	Ravioli, meat-filled, no sauce*
58131320	Ravioli, meat-filled, with tomato sauce or meat sauce*
58131330	Ravioli, meat-filled, with cream sauce*
58131510	Ravioli, cheese-filled, no sauce*
58131520	Ravioli, cheese-filled, with tomato sauce*
58131530	Ravioli, cheese-filled, with meat sauce*
58131535	Ravioli, cheese-filled, with cream sauce*
58131590	Ravioli, cheese and spinach-filled, no sauce*
58131600	Ravioli, cheese and spinach-filled, with cream sauce*
58131610	Ravioli, cheese and spinach filled, with tomato sauce*

Food code	Food description
58132110	Spaghetti with tomato sauce, meatless*
58132340	Spaghetti with tomato sauce and vegetables*
58132350	Spaghetti with tomato sauce, meatless, whole wheat noodles*
58132360	Spaghetti with tomato sauce and meatballs, whole wheat noodles or spaghetti with meat sauce, whole wheat noodles or spaghetti with meat sauce and meatballs, whole wheat noodles*
58132460	Spaghetti with tomato sauce and meatballs made with spinach noodles, or spaghetti with meat sauce made with spinach noodles, or spaghetti with meat sauce and meatballs made with spinach noodles*
58132710	Spaghetti with tomato sauce and frankfurters or hot dogs*
58132800	Spaghetti with clam sauce, NS as to red or white*
58132910	Spaghetti with tomato sauce and poultry*
58133120	Manicotti, cheese-filled, with tomato sauce, meatless*
58134110	Stuffed shells, cheese-filled, no sauce*
58134120	Stuffed shells, cheese-filled, with tomato sauce, meatless*
58134130	Stuffed shells, cheese-filled, with meat sauce*
58134160	Stuffed shells, cheese- and spinach- filled, no sauce*
58134610	Tortellini, meat-filled, with tomato sauce*
58134620	Tortellini, cheese-filled, meatless, with tomato sauce*
58134640	Tortellini, cheese-filled, meatless, with vinaigrette dressing*
58134650	Tortellini, meat-filled, no sauce*
58134660	Tortellini, cheese-filled, with cream sauce*
58134680	Tortellini, cheese-filled, no sauce*
58134710	Tortellini, spinach-filled, with tomato sauce*
58134720	Tortellini, spinach-filled, no sauce*
58135110	Chow fun noodles with meat and vegetables*
58135120	Chow fun noodles with vegetables, meatless*
58136120	Lo mein, meatless*
58136130	Lo mein, with shrimp*
58136140	Lo mein, with pork*
58136150	Lo mein, with beef*
58136160	Lo mein, with chicken*
58137220	Pad Thai, meatless*
58137230	Pad Thai with chicken*
58137240	Pad Thai with seafood*
58137250	Pad Thai with meat*
58137300	Adobo, with noodles*
58145111	Macaroni or noodles with cheese, from restaurant*
58145135	Macaroni or noodles with cheese and meat*
58145140	Macaroni or noodles with cheese and tomato*
58145160	Macaroni or noodles with cheese and frankfurters or hot dogs*
58145170	Macaroni or noodles with cheese and egg*
58145190	Macaroni or noodles with cheese and chicken or turkey*
58146100	Pasta with tomato sauce, meatless*
58146110	Pasta with meat sauce*
58146120	Pasta with tomato-based sauce, cheese and meat*
58146130	Pasta with carbonara sauce*
58146150	Pasta with tomato-based sauce and cheese*
58146160	Pasta with vegetables, no sauce or dressing*
58146210	Pasta with sauce, NFS*

Food code	Food description
58146215	Pasta with sauce, meatless, school lunch*
58146221	Pasta with tomato-based sauce, restaurant*
58146222	Pasta with tomato-based sauce, home recipe*
58146223	Pasta with tomato-based sauce, ready-to-heat*
58146301	Pasta with tomato-based sauce, and added vegetables, restaurant*
58146302	Pasta with tomato-based sauce, and added vegetables, home recipe*
58146303	Pasta with tomato-based sauce, and added vegetables, ready-to-heat*
58146310	Pasta, whole wheat, with tomato sauce, meatless*
58146315	Pasta with sauce and meat, from school lunch*
58146321	Pasta with tomato-based sauce and meat, restaurant*
58146322	Pasta with tomato-based sauce and meat, home recipe*
58146332	Pasta with tomato-based sauce, meat, and added vegetables, home recipe*
58146333	Pasta with tomato-based sauce, meat, and added vegetables, ready-to-heat*
58146341	Pasta with tomato-based sauce and poultry, restaurant*
58146342	Pasta with tomato-based sauce and poultry, home recipe*
58146343	Pasta with tomato-based sauce and poultry, ready-to-heat*
58146351	Pasta with tomato-based sauce, poultry, and added vegetables, restaurant*
58146352	Pasta with tomato-based sauce, poultry, and added vegetables, home recipe*
58146353	Pasta with tomato-based sauce, poultry, and added vegetables, ready-to-heat*
58146361	Pasta with tomato-based sauce and seafood, restaurant*
58146362	Pasta with tomato-based sauce and seafood, home recipe*
58146363	Pasta with tomato-based sauce and seafood, ready-to-heat*
58146371	Pasta with tomato-based sauce, seafood, and added vegetables, restaurant*
58146372	Pasta with tomato-based sauce, seafood, and added vegetables, home recipe*
58146373	Pasta with tomato-based sauce, seafood, and added vegetables, ready-to-heat*
58146381	Pasta with cream sauce, restaurant*
58146382	Pasta with cream sauce, home recipe*
58146383	Pasta with cream sauce, ready-to-heat*
58146391	Pasta with cream sauce and added vegetables, restaurant*
58146392	Pasta with cream sauce and added vegetables, from home recipe*
58146393	Pasta with cream sauce and added vegetables, ready-to-heat*
58146401	Pasta with cream sauce and meat, restaurant*
58146402	Pasta with cream sauce and meat, home recipe*
58146403	Pasta with cream sauce and meat, ready-to-heat*
58146411	Pasta with cream sauce, meat, and added vegetables, restaurant*
58146412	Pasta with cream sauce, meat, and added vegetables, home recipe*
58146413	Pasta with cream sauce, meat, and added vegetables, ready-to-heat*
58146421	Pasta with cream sauce and poultry, restaurant*
58146422	Pasta with cream sauce and poultry, home recipe*
58146423	Pasta with cream sauce and poultry, ready-to-heat*
58146431	Pasta with cream sauce, poultry, and added vegetables, restaurant*
58146432	Pasta with cream sauce, poultry, and added vegetables, home recipe*
58146433	Pasta with cream sauce, poultry, and added vegetables, ready-to-heat*
58146441	Pasta with cream sauce and seafood, restaurant*
58146442	Pasta with cream sauce and seafood, home recipe*
58146443	Pasta with cream sauce and seafood, ready-to-heat*
58146451	Pasta with cream sauce, seafood, and added vegetables, restaurant*
58146452	Pasta with cream sauce, seafood, and added vegetables, home recipe*
58146602	Pasta, whole grain, with tomato-based sauce, home recipe*
58146603	Pasta, whole grain, with tomato-based sauce, ready-to-heat*

Food code	Food description
58146612	Pasta, whole grain, with tomato-based sauce and added vegetables, home recipe*
58146613	Pasta, whole grain, with tomato-based sauce and added vegetables, ready-to-heat*
58146622	Pasta, whole grain, with tomato-based sauce and meat, home recipe*
58146623	Pasta, whole grain, with tomato-based sauce and meat, ready-to-heat*
58146632	Pasta, whole grain, with tomato-based sauce, meat, and added vegetables, home recipe*
58146642	Pasta, whole grain, with tomato-based sauce and poultry, home recipe*
58146652	Pasta, whole grain, with tomato-based sauce, poultry, and added vegetables, home recipe*
58146662	Pasta, whole grain, with tomato-based sauce and seafood, home recipe*
58146672	Pasta, whole grain, with tomato-based sauce, seafood, and added vegetables, home recipe*
58146682	Pasta, whole grain, with cream sauce, home recipe*
58146683	Pasta, whole grain, with cream sauce, ready-to-heat*
58146692	Pasta, whole grain, with cream sauce, and added vegetables, home recipe*
58146693	Pasta, whole grain, with cream sauce, and added vegetables, ready-to-heat*
58146702	Pasta, whole grain, with cream sauce and meat, home recipe*
58146723	Pasta, whole grain, with cream sauce and poultry, ready-to-heat*
58146732	Pasta, whole grain, with cream sauce, poultry, and added vegetables, home recipe*
58146741	Pasta, whole grain, with cream sauce and seafood, restaurant*
58147100	Pasta with pesto sauce*
58147110	Pasta with tomato-based sauce and beans or lentils*
58147310	Macaroni, creamed*
58147330	Macaroni or noodles, creamed, with cheese*
58147350	Macaroni, creamed, with vegetables*
58148110	Macaroni or pasta salad, made with mayonnaise*
58148111	Macaroni or pasta salad, made with light mayonnaise*
58148112	Macaroni or pasta salad, made with mayonnaise-type salad dressing*
58148114	Macaroni or pasta salad, made with Italian dressing*
58148115	Macaroni or pasta salad, made with light Italian dressing*
58148117	Macaroni or pasta salad, made with light creamy dressing*
58148118	Macaroni or pasta salad, made with any type of fat free dressing*
58148120	Macaroni or pasta salad with egg*
58148130	Macaroni or pasta salad with tuna*
58148140	Macaroni or pasta salad with crab meat*
58148150	Macaroni or pasta salad with shrimp*
58148160	Macaroni or pasta salad with tuna and egg*
58148170	Macaroni or pasta salad with chicken*
58148180	Macaroni or pasta salad with cheese*
58148550	Macaroni or pasta salad with meat*
58400000	Soup, NFS*
58400100	Noodle soup, NFS*
58402010	Beef noodle soup, canned or ready-to-serve*
58402100	Beef noodle soup, home recipe*
58403010	Chicken or turkey noodle soup, canned or ready-to-serve*
58403040	Chicken or turkey noodle soup, home recipe*
58403050	Chicken or turkey noodle soup, cream of, home recipe, canned, or ready-to-serve*
58403060	Chicken or turkey noodle soup, reduced sodium, canned or ready-to-serve*
58403100	Noodle and potato soup, Puerto Rican style*
58404520	Chicken or turkey soup with dumplings, home recipe, canned or ready-to-serve*
58407010	Instant soup, noodle*
58407030	Soup, mostly noodles*

Food code	Food description
58407035	Soup, mostly noodles, reduced sodium*
58408500	Noodle soup with vegetables, Asian style*
58409000	Noodle soup, with fish ball, shrimp, and dark green leafy vegetable*
58421000	Sopa seca, Mexican style, NFS*
58421010	Sopa Seca de Fideo, Mexican style, made with dry noodles, home recipe*
58421020	Sopa de Fideo Aguada, Mexican style noodle soup, home recipe*
72202010	Broccoli casserole with noodles*
74603010	Tomato beef soup, prepared with water*
74604010	Tomato beef noodle soup, prepared with water*
74604500	Tomato noodle soup, canned, prepared with water or ready-to-serve*
74604600	Tomato noodle soup, canned, prepared with milk*
75340160	Vegetable and pasta combinations with cream or cheese sauce, broccoli, pasta, carrots, corn, zucchini, peppers, cauliflower, peas, etc., cooked*
75460700	Vegetable combinations, including carrots, broccoli, and/or dark-green leafy; cooked, with pasta*
75460710	Vegetable combinations, excluding carrots, broccoli, and dark-green leafy; cooked, with pasta*
75460800	Vegetable combinations, including carrots, broccoli, and/or dark-green leafy; cooked, with butter sauce and pasta*
75460810	Vegetable combinations, excluding carrots, broccoli, and dark-green leafy; cooked, with butter sauce and pasta*
75460900	Chow mein or chop suey, meatless, with noodles*
75649150	Vegetable noodle soup, home recipe*
75651000	Minestrone soup, home recipe*
75651150	Vegetable noodle soup, reduced sodium, canned, prepared with water or ready-to-serve*
75652040	Vegetable beef soup with noodles or pasta, home recipe*
75656040	Vegetable soup, with pasta, chunky style*
Processed meats	
14610520	Cheese with nuts*
14620320	Topping from meat pizza*
14620330	Topping from meat and vegetable pizza*
21416000	Corned beef, cooked, NS as to fat eaten
21416110	Corned beef, cooked, lean and fat eaten
21416120	Corned beef, cooked, lean only eaten
21416150	Corned beef, canned, ready-to-eat
21601000	Beef, bacon, cooked
21601010	Beef, bacon, reduced sodium, cooked
21602000	Beef, dried, chipped, uncooked
21602010	Beef, dried, chipped, cooked in fat
21602100	Beef jerky
21603000	Beef, pastrami (beef, smoked, spiced)
22001000	Pork, pickled, NS as to cut
22002800	Pork jerky
22107010	Pork chop, smoked or cured, cooked, lean and fat eaten
22107020	Pork chop, smoked or cured, cooked, lean only eaten
22300120	Ham, fried, NS as to fat eaten
22300130	Ham, fried, lean and fat eaten
22300140	Ham, fried, lean only eaten
22300160	Ham, breaded or floured, fried, lean and fat eaten
22300170	Ham, breaded or floured, fried, lean only eaten

Food code	Food description
22311000	Ham, smoked or cured, cooked, NS as to fat eaten
22311010	Ham, smoked or cured, cooked, lean and fat eaten
22311020	Ham, smoked or cured, cooked, lean only eaten
22311450	Ham, prosciutto
22311510	Ham, smoked or cured, canned, lean and fat eaten
22321110	Ham, smoked or cured, ground patty
22421000	Pork roast, smoked or cured, cooked, NS as to fat eaten
22421010	Pork roast, smoked or cured, cooked, lean and fat eaten
22421020	Pork roast, smoked or cured, cooked, lean only eaten
22431000	Pork roll, cured, fried
22501010	Canadian bacon, cooked
22600100	Bacon, NS as to type of meat, cooked
22600200	Pork bacon, NS as to fresh, smoked or cured, cooked
22600210	Pork bacon, NS as to fresh, smoked or cured, reduced sodium, cooked
22601000	Pork bacon, smoked or cured, cooked
22601040	Bacon or side pork, fresh, cooked
22602010	Pork bacon, smoked or cured, reduced sodium, cooked
22704010	Pork, cracklings, cooked
22706010	Pork, neck bones, cooked*
22707020	Pork, pig's feet, pickled
23321900	Venison/deer jerky
23322100	Deer sausage
24198570	Chicken, canned, meat only
24198671	Chicken patty, breaded
24198690	Chicken patty, fillet, or tenders, breaded, cooked, from fast food / restaurant
24198695	Chicken patty, fillet, or tenders, breaded, cooked, from school lunch
24198700	Chicken patty, fillet, or tenders, breaded, cooked
24198729	Chicken nuggets, NFS
24198730	Chicken nuggets, from fast food / restaurant
24198731	Chicken nuggets, from fast food
24198732	Chicken nuggets, from restaurant
24198735	Chicken nuggets, from school lunch
24198736	Chicken nuggets, from frozen
24198737	Chicken nuggets, from other sources
24198740	Chicken nuggets
24198745	Chicken tenders or strips, breaded, from school lunch
24208000	Turkey, nuggets
24208500	Turkey bacon, cooked
24208510	Turkey bacon, reduced sodium, cooked
25112200	Liver paste or pate, chicken
25160110	Tongue, smoked, cured, or pickled, cooked
25210110	Frankfurter, wiener, or hot dog, NFS
25210150	Frankfurter or hot dog, cheese-filled
25210210	Frankfurter or hot dog, beef
25210220	Frankfurter or hot dog, beef and pork
25210240	Frankfurter or hot dog, beef and pork, reduced fat or light
25210250	Frankfurter or hot dog, meat and poultry, fat free
25210280	Frankfurter or hot dog, meat and poultry
25210290	Frankfurter or hot dog, meat and poultry, reduced fat or light
25210310	Frankfurter or hot dog, chicken

Food code	Food description
25210410	Frankfurter or hot dog, turkey
25210620	Frankfurter or hot dog, beef, reduced fat or light
25220010	Cold cut, NFS
25220105	Beef sausage
25220106	Beef sausage, reduced fat
25220108	Beef sausage, reduced sodium
25220150	Beef sausage with cheese*
25220210	Blood sausage
25220350	Bratwurst
25220360	Bratwurst, with cheese*
25220390	Bologna, beef, lowfat
25220400	Bologna, pork and beef
25220410	Bologna, NFS
25220425	Bologna, made from any kind of meat, reduced fat
25220430	Bologna, beef
25220435	Bologna, made from any kind of meat, reduced sodium
25220440	Bologna, turkey
25220470	Bologna, beef, lower sodium
25220500	Bologna, beef and pork, lowfat
25220510	Capicola
25220650	Turkey or chicken and beef sausage*
25220710	Chorizo
25221210	Mortadella
25221215	Pastrami, NFS
25221220	Pastrami, made from any kind of meat, reduced fat
25221250	Pepperoni, NFS
25221255	Pepperoni, reduced fat
25221310	Polish sausage
25221350	Italian sausage
25221400	Sausage, NFS
25221405	Pork sausage
25221406	Pork sausage, reduced fat
25221408	Pork sausage, reduced sodium
25221450	Pork sausage rice links
25221460	Pork and beef sausage
25221500	Salami, NFS
25221505	Salami, made from any type of meat, reduced fat
25221515	Salami, made from any type of meat, reduced sodium
25221530	Salami, beef
25221610	Scrapple, cooked
25221810	Thuringer
25221830	Turkey or chicken sausage
25221855	Turkey or chicken sausage, reduced sodium
25221860	Turkey or chicken sausage, reduced fat
25221870	Turkey or chicken and pork sausage
25221875	Turkey or chicken, pork, and beef sausage, reduced sodium
25221910	Vienna sausage, canned
25221950	Pickled sausage
25230110	Luncheon meat, NFS
25230210	Ham, prepackaged or deli, luncheon meat

Food code	Food description
25230220	Ham, prepackaged or deli, luncheon meat, reduced sodium
25230230	Ham, sliced, extra lean, prepackaged or deli, luncheon meat
25230235	Ham, sliced, extra lean, lower sodium, prepackaged or deli, luncheon meat
25230310	Chicken or turkey loaf, prepackaged or deli, luncheon meat
25230320	Chicken, prepackaged or deli, luncheon meat
25230340	Chicken, prepackaged or deli, luncheon meat, reduced sodium
25230420	Ham luncheon meat, loaf type
25230430	Ham and cheese loaf
25230530	Ham and pork, canned luncheon meat, chopped, minced, pressed, spiced
25230540	Ham, pork and chicken, canned luncheon meat, chopped, minced, pressed, spiced, reduced fat and reduced sodium
25230550	Ham, pork, and chicken, canned luncheon meat, chopped, minced, pressed, spiced, reduced sodium
25230560	Liverwurst
25230610	Luncheon meat, loaf type
25230780	Turkey, prepackaged or deli, luncheon meat
25230785	Turkey, prepackaged or deli, luncheon meat, reduced sodium
25230790	Turkey ham, sliced, extra lean, prepackaged or deli, luncheon meat
25230800	Turkey ham, prepackaged or deli, luncheon meat
25230820	Turkey pastrami
25230840	Turkey salami
25230900	Turkey or chicken breast, prepackaged or deli, luncheon meat
25230905	Turkey or chicken breast, low salt, prepackaged or deli, luncheon meat
25231110	Beef, prepackaged or deli, luncheon meat
25231120	Beef, prepackaged or deli, luncheon meat, reduced sodium
25231150	Corned beef, pressed
25240000	Meat spread or potted meat, NFS
25240110	Chicken salad spread
25240220	Ham salad spread
25240310	Roast beef spread
26100260	Fish stick, patty or nugget from fast food
26100270	Fish stick, patty or nugget from restaurant, home, or other place
27113200	Creamed chipped or dried beef*
27118120	Stewed seasoned ground beef, Puerto Rican style*
27118130	Stewed dried beef, Puerto Rican style*
27118180	Beef stew, meat with gravy, no potatoes, Puerto Rican style*
27120110	Sausage with tomato-based sauce*
27120120	Sausage gravy*
27120210	Frankfurter or hot dog, with chili, no bun*
27120250	Frankfurters or hot dogs with tomato-based sauce*
27121010	Stewed pork, Puerto Rican style*
27133010	Stewed goat, Puerto Rican style*
27146250	Chicken or turkey cordon bleu*
27148010	Stuffed chicken, drumstick or breast, Puerto Rican style*
27211400	Corned beef hash*
27218210	Beef stew with potatoes, Puerto Rican style*
27220010	Meat loaf made with ham*
27220020	Ham and noodles with cream or white sauce*
27220080	Ham croquette*
27220120	Sausage and rice with tomato-based sauce*

Food code	Food description
27220190	Sausage and noodles with cream or white sauce*
27220210	Ham and noodles, no sauce*
27246300	Chicken or turkey cake, patty, or croquette
27260110	Hash, NS as to type of meat*
27311210	Corned beef, potatoes, and vegetables including carrots, broccoli, and/or dark-green leafy; no sauce*
27311220	Corned beef, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; no sauce*
27320080	Sausage, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; tomato-based sauce*
27320090	Sausage, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; tomato-based sauce*
27320120	Sausage, potatoes, and vegetables including carrots, broccoli, and/or dark-green leafy; gravy*
27320130	Sausage, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; gravy*
27320410	Ham, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; no sauce*
27348100	Chicken fricassee, Puerto Rican style*
27350030	Seafood stew with potatoes and vegetables excluding carrots, broccoli, and dark-green leafy; tomato-based sauce*
27350310	Seafood stew with potatoes and vegetables including carrots, broccoli, and/or dark-green leafy; tomato-based sauce*
27360090	Paella, NFS*
27362000	Stewed tripe, with potatoes, Puerto Rican style*
27363100	Jambalaya with meat and rice*
27411150	Beef rolls, stuffed with vegetables or meat mixture, tomato-based sauce*
27418310	Corned beef with tomato sauce and onion, Puerto Rican style*
27420010	Cabbage with ham hocks*
27420020	Ham or pork salad*
27420080	Greens with ham or pork*
27420250	Ham and vegetables including carrots broccoli, and/or dark- green leafy; no potatoes, no sauce*
27420270	Ham and vegetables excluding carrots, broccoli, and dark-green leafy; no potatoes, no sauce*
27420460	Sausage and vegetables, excluding carrots, broccoli, and dark-green leafy; no potatoes, tomato-based sauce*
27420470	Sausage and peppers, no sauce*
27446315	Chicken or turkey garden salad with bacon and cheese, chicken and/or turkey, bacon, cheese, lettuce and/or greens, tomato and/or carrots, other vegetables, no dressing*
27446320	Chicken or turkey, breaded, fried, garden salad with bacon and cheese, chicken and/or turkey, bacon, cheese, lettuce and/or greens, tomato and/or carrots, other vegetables, no dressing*
27448020	Chicken or turkey fricassee, with sauce, no potatoes, potatoes reported separately, Puerto Rican style*
27450250	Oysters Rockefeller*
27460510	Antipasto with ham, fish, cheese, vegetables*
27461010	Stewed seasoned ground beef, Puerto Rican style (Picadillo para relleno)*
27500050	Sandwich, NFS*
27510276	Bacon cheeseburger, 1 small patty, with condiments, on bun, from fast food / restaurant*
27510281	Bacon cheeseburger, 1 small patty, with condiments, on bun, from fast food / restaurant (Wendy's Jr. Bacon Cheeseburger)*

Food code	Food description
27510305	Bacon cheeseburger, 1 medium patty, plain, on bun, from fast food / restaurant*
27510312	Bacon cheeseburger, 1 medium patty, with condiments, on bun, from fast food / restaurant*
27510331	Bacon cheeseburger, 1 medium patty, plain, on white bun*
27510341	Bacon cheeseburger, 1 medium patty, with condiments, on white bun*
27510342	Bacon cheeseburger, 1 medium patty, with condiments, on wheat bun*
27510343	Bacon cheeseburger, 1 medium patty, with condiments, on whole wheat bun*
27510346	Bacon cheeseburger, 1 large patty, with condiments, on bun, from fast food / restaurant*
27510360	Bacon cheeseburger, with mayonnaise or salad dressing, tomato and/or catsup, on bun*
27510385	Double bacon cheeseburger (2 patties), with tomato and/or catsup, on bun*
27510400	Bacon cheeseburger, 1/4 lb meat, with tomato and/or catsup, on bun*
27510425	Double bacon cheeseburger (2 patties, 1/4 lb meat each), with mayonnaise or salad dressing, on bun*
27510430	Double bacon cheeseburger (2 patties, 1/4 lb meat each), with mayonnaise or salad dressing, and tomato and/or catsup, on bun*
27510431	Double bacon cheeseburger, 2 small patties, with condiments, on bun, from fast food / restaurant (Burger King Bacon Double Cheeseburger)*
27510435	Double bacon cheeseburger (2 patties,1/3 lb meat each), with mayonnaise or salad dressing, on bun*
27510440	Bacon cheeseburger, 1/4 lb meat, with mayonnaise or salad dressing, and tomato and/or catsup, on bun*
27510445	Bacon cheeseburger, 1/3 lb meat, with tomato and/or catsup, on bun*
27510446	Double bacon cheeseburger, 2 medium patties, plain, on bun, from fast food / restaurant*
27510451	Double bacon cheeseburger, 2 medium patties, with condiments, on bun, from fast food / restaurant*
27510465	Double bacon cheeseburger, 2 medium patties, with condiments, on bun, from fast food / restaurant (Wendy's Baconator)*
27510475	Double bacon cheeseburger, 2 large patties, with condiments, on bun, from fast food / restaurant*
27510950	Reuben sandwich, corned beef sandwich with sauerkraut and cheese, with spread*
27511010	Pastrami sandwich*
27513010	Roast beef sandwich*
27520130	Bacon, chicken, and tomato club sandwich, with lettuce and spread*
27520135	Bacon, chicken, and tomato club sandwich, with cheese, lettuce and spread*
27520150	Bacon, lettuce, and tomato sandwich with spread*
27520155	Bacon, lettuce, and tomato submarine sandwich, with spread*
27520156	Bacon, lettuce, tomato, and cheese submarine sandwich, with spread*
27520160	Bacon, chicken, and tomato club sandwich, on multigrain roll with lettuce and spread*
27520165	Bacon, breaded fried chicken fillet, and tomato club with lettuce and spread*
27520166	Bacon, breaded fried chicken fillet, and tomato club sandwich with cheese, lettuce and spread*
27520170	Bacon on biscuit*
27520250	Ham on biscuit*
27520300	Ham sandwich, with spread*
27520320	Ham and cheese sandwich, with lettuce and spread*
27520330	Ham and egg sandwich*
27520350	Ham and cheese sandwich, with spread, grilled*
27520370	Hot ham and cheese sandwich, on bun*
27520390	Ham and cheese submarine sandwich, with lettuce, tomato and spread*
27540140	Chicken fillet, breaded, fried, sandwich*
27540145	Chicken fillet, breaded, fried, sandwich on biscuit*

Food code	Food description
27540150	Chicken fillet, breaded, fried, sandwich with lettuce, tomato and spread*
27540151	Chicken fillet, breaded, fried, sandwich with cheese, lettuce, tomato and spread*
27540170	Chicken patty sandwich, miniature, with spread*
27540180	Chicken patty sandwich or biscuit*
27540190	Chicken patty sandwich, with lettuce and spread*
27540210	Wrap sandwich filled with breaded fried chicken strips, cheese, lettuce, and spread*
27540285	Chicken, bacon, and tomato club sandwich, with lettuce and spread*
27540361	Turkey and bacon submarine sandwich, with cheese, lettuce, tomato and spread*
27541000	Turkey, ham, and roast beef club sandwich, with lettuce, tomato and spread*
27541001	Turkey, ham, and roast beef club sandwich with cheese, lettuce, tomato, and spread*
27560300	Corn dog, frankfurter or hot dog with cornbread coating*
27560350	Pig in a blanket, frankfurter or hot dog wrapped in dough*
27560500	Pepperoni and salami submarine sandwich, with lettuce, tomato and spread*
27560650	Sausage on biscuit*
27560660	Sausage griddle cake sandwich*
27560670	Sausage and cheese on English muffin*
27560705	Sausage balls, made with biscuit mix and cheese*
27560710	Sausage sandwich*
27564000	Frankfurter or hot dog sandwich, NFS, plain, on white bun*
27564001	Frankfurter or hot dog sandwich, NFS, plain, on wheat bun*
27564002	Frankfurter or hot dog sandwich, NFS, plain, on whole wheat bun*
27564010	Frankfurter or hot dog sandwich, NFS, plain, on white bread*
27564020	Frankfurter or hot dog sandwich, NFS, plain, on wheat bread*
27564030	Frankfurter or hot dog sandwich, NFS, plain, on whole wheat bread*
27564060	Frankfurter or hot dog sandwich, beef, plain, on white bun*
27564061	Frankfurter or hot dog sandwich, beef, plain, on wheat bun*
27564062	Frankfurter or hot dog sandwich, beef, plain, on whole wheat bun*
27564063	Frankfurter or hot dog sandwich, beef, plain, on whole grain white bun*
27564064	Frankfurter or hot dog sandwich, beef, plain, on multigrain bun*
27564070	Frankfurter or hot dog sandwich, beef, plain, on white bread*
27564080	Frankfurter or hot dog sandwich, beef, plain, on wheat bread*
27564090	Frankfurter or hot dog sandwich, beef, plain, on whole wheat bread*
27564100	Frankfurter or hot dog sandwich, beef, plain, on whole grain white bread*
27564110	Frankfurter or hot dog sandwich, beef, plain, on multigrain bread*
27564120	Frankfurter or hot dog sandwich, beef and pork, plain, on white bun*
27564121	Frankfurter or hot dog sandwich, beef and pork, plain, on wheat bun*
27564130	Frankfurter or hot dog sandwich, beef and pork, plain, on white bread*
27564140	Frankfurter or hot dog sandwich, beef and pork, plain, on wheat bread*
27564150	Frankfurter or hot dog sandwich, beef and pork, plain, on whole wheat bread*
27564160	Frankfurter or hot dog sandwich, beef and pork, plain, on whole grain white bread*
27564180	Frankfurter or hot dog sandwich, meat and poultry, plain, on white bun*
27564181	Frankfurter or hot dog sandwich, meat and poultry, plain, on wheat bun*
27564182	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole wheat bun*
27564190	Frankfurter or hot dog sandwich, meat and poultry, plain, on white bread*
27564200	Frankfurter or hot dog sandwich, meat and poultry, plain, on wheat bread*
27564210	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole wheat bread*
27564220	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole grain white bread*
27564230	Frankfurter or hot dog sandwich, meat and poultry, plain, on multigrain bread*
27564240	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on white bun*
27564241	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on wheat bun*

Food code	Food description
27564242	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole wheat bun*
27564243	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole grain white bun*
27564250	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on white bread*
27564260	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on wheat bread*
27564270	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole wheat bread*
27564280	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole grain white bread*
27564300	Frankfurter or hot dog sandwich, reduced fat or light, plain, on white bun*
27564301	Frankfurter or hot dog sandwich, reduced fat or light, plain, on wheat bun*
27564303	Frankfurter or hot dog sandwich, reduced fat or light, plain, on whole grain white bun*
27564310	Frankfurter or hot dog sandwich, reduced fat or light, plain, on white bread*
27564330	Frankfurter or hot dog sandwich, reduced fat or light, plain, on whole wheat bread*
27564360	Frankfurter or hot dog sandwich, fat free, plain, on white bun*
27564361	Frankfurter or hot dog sandwich, fat free, plain, on wheat bun*
27564362	Frankfurter or hot dog sandwich, fat free, plain, on whole wheat bun*
27564364	Frankfurter or hot dog sandwich, fat free, plain, on multigrain bun*
27564370	Frankfurter or hot dog sandwich, fat free, plain, on white bread*
27564440	Frankfurter or hot dog sandwich, with chili, on white bun*
27564441	Frankfurter or hot dog sandwich, with chili, on wheat bun*
27564442	Frankfurter or hot dog sandwich, with chili, on whole wheat bun*
27564443	Frankfurter or hot dog sandwich, with chili, on whole grain white bun*
27564450	Frankfurter or hot dog sandwich, with chili, on white bread*
27564460	Frankfurter or hot dog sandwich, with chili, on wheat bread*
27564500	Frankfurter or hot dog sandwich, with meatless chili, on white bun*
27564510	Frankfurter or hot dog sandwich, with meatless chili, on white bread*
28140720	Chicken patty, or nuggets, boneless, breaded, potatoes, vegetable, frozen meal*
28310230	Meatball soup, home recipe, Mexican style*
28311010	Pepperpot soup*
28320130	Ham, rice, and potato soup, Puerto Rican style*
28320140	Ham, noodle, and vegetable soup, Puerto Rican style*
28340210	Chicken rice soup, Puerto Rican style*
28340220	Chicken soup with noodles and potatoes, Puerto Rican style*
28340700	Bird's nest soup*
28350050	Fish chowder*
32101500	Egg, Benedict*
32105190	Egg casserole with bread, cheese, milk and meat*
32105330	Scrambled eggs with jerked beef, Puerto Rican style*
32130190	Egg omelet or scrambled egg, with meat, NS as to fat added in cooking*
32130200	Egg omelet or scrambled egg, with meat, made with margarine*
32130210	Egg omelet or scrambled egg, with meat, made with oil*
32130220	Egg omelet or scrambled egg, with meat, made with butter*
32130240	Egg omelet or scrambled egg, with meat, made with animal fat or meat drippings*
32130260	Egg omelet or scrambled egg, with meat, made with cooking spray*
32130265	Egg omelet or scrambled egg, with meat, NS as to type of fat*
32130270	Egg omelet or scrambled egg, with meat, made without fat*
32130290	Egg omelet or scrambled egg, with cheese and meat, NS as to fat added in cooking*
32130300	Egg omelet or scrambled egg, with cheese and meat, made with margarine*
32130310	Egg omelet or scrambled egg, with cheese and meat, made with oil*
32130320	Egg omelet or scrambled egg, with cheese and meat, made with butter*
32130360	Egg omelet or scrambled egg, with cheese and meat, made with cooking spray*
32130370	Egg omelet or scrambled egg, with cheese and meat, made without fat*

Food code	Food description
32130800	Egg omelet or scrambled egg, with meat and tomatoes, fat added in cooking*
32130810	Egg omelet or scrambled egg, with meat and tomatoes, fat not added in cooking*
32130820	Egg omelet or scrambled egg, with meat and tomatoes, NS as to fat added in cooking*
32130830	Egg omelet or scrambled egg, with meat and dark-green vegetables, fat added in cooking*
32130840	Egg omelet or scrambled egg, with meat and dark-green vegetables, fat not added in cooking*
32130850	Egg omelet or scrambled egg, with meat and dark-green vegetables, NS as to fat added in cooking*
32130890	Egg omelet or scrambled egg, with meat and vegetables other than dark-green and/or tomatoes, fat added in cooking*
32130900	Egg omelet or scrambled egg, with meat and vegetables other than dark-green and/or tomatoes, fat not added in cooking*
32130910	Egg omelet or scrambled egg, with meat and vegetables other than dark-green and/or tomatoes, NS as to fat added in cooking*
32131000	Egg omelet or scrambled egg, with cheese, meat, and tomatoes, fat added in cooking*
32131010	Egg omelet or scrambled egg, with cheese, meat, and tomatoes, fat not added in cooking*
32131020	Egg omelet or scrambled egg, with cheese, meat, and tomatoes, NS as to fat added in cooking*
32131030	Egg omelet or scrambled egg, with cheese, meat, and dark-green vegetables, fat added in cooking*
32131040	Egg omelet or scrambled egg, with cheese, meat, and dark-green vegetables, fat not added in cooking*
32131050	Egg omelet or scrambled egg, with cheese, meat, and dark-green vegetables, NS as to fat added in cooking*
32131060	Egg omelet or scrambled egg, with cheese, meat, tomatoes, and dark-green vegetables, fat added in cooking*
32131080	Egg omelet or scrambled egg, with cheese, meat, tomatoes, and dark-green vegetables, NS as to fat added in cooking*
32131090	Egg omelet or scrambled egg, with cheese, meat, and vegetables other than dark-green and/or tomatoes, fat added in cooking*
32131100	Egg omelet or scrambled egg, with cheese, meat, and vegetables other than dark-green and/or tomatoes, fat not added in cooking*
32131110	Egg omelet or scrambled egg, with cheese, meat, and vegetables other than dark-green and/or tomatoes, NS as to fat added in cooking*
32202000	Egg, cheese, ham, and bacon on bun*
32202010	Egg, cheese, and ham on English muffin*
32202020	Egg, cheese, and ham on biscuit*
32202025	Egg, cheese and ham on bagel*
32202030	Egg, cheese, and sausage on English muffin*
32202034	Egg, cheese, and sausage on bun*
32202035	Egg, extra cheese, and extra sausage, on bun*
32202050	Egg, cheese, and sausage on biscuit*
32202055	Egg, cheese, and sausage griddle cake sandwich*
32202060	Egg and sausage on biscuit*
32202070	Egg, cheese, and bacon on biscuit*
32202075	Egg, cheese, and bacon griddle cake sandwich*
32202080	Egg, cheese, and bacon on English muffin*
32202085	Egg, cheese and bacon on bagel*
32202090	Egg and bacon on biscuit*
32202110	Egg and ham on biscuit*

Food code	Food description
32202120	Egg, cheese and sausage on bagel*
32400200	Egg white, omelet, scrambled, or fried, with meat, fat added in cooking*
32400210	Egg white, omelet, scrambled, or fried, with meat, fat not added in cooking*
32400220	Egg white, omelet, scrambled, or fried, with meat, NS as to fat added in cooking*
32400400	Egg white, omelet, scrambled, or fried, with cheese and meat, fat added in cooking*
32400410	Egg white, omelet, scrambled, or fried, with cheese and meat, fat not added in cooking*
32400420	Egg white, omelet, scrambled, or fried, with cheese and meat, NS as to fat added in cooking*
32400600	Egg white, omelet, scrambled, or fried, with meat and vegetables, fat added in cooking*
32400610	Egg white, omelet, scrambled, or fried, with meat and vegetables, fat not added in cooking*
32400620	Egg white, omelet, scrambled, or fried, with meat and vegetables, NS as to fat added in cooking*
32400700	Egg white, omelet, scrambled, or fried, with cheese, meat, and vegetables, fat added in cooking*
32400710	Egg white, omelet, scrambled, or fried, with cheese, meat, and vegetables, fat not added in cooking*
33401100	Egg substitute, omelet, scrambled, or fried, with meat, fat added in cooking*
33401300	Egg substitute, omelet, scrambled, or fried, with cheese and meat, fat added in cooking*
33401310	Egg substitute, omelet, scrambled, or fried, with cheese and meat, fat not added in cooking*
33401500	Egg substitute, omelet, scrambled, or fried, with meat and vegetables, fat added in cooking*
33401510	Egg substitute, omelet, scrambled, or fried, with meat and vegetables, fat not added in cooking*
33401600	Egg substitute, omelet, scrambled, or fried, with cheese, meat, and vegetables, fat added in cooking*
41205030	Refried beans with meat*
41206030	Beans and franks*
41208100	Beans, dry, cooked with pork*
41210090	Stewed beans with pork, tomatoes, and chili peppers, Mexican style*
41304130	Cowpeas, dry, cooked with pork*
41310150	Stewed chickpeas, Puerto Rican style*
41310160	Stewed chickpeas, with potatoes, Puerto Rican style*
41601040	Lima bean soup, home recipe, canned or ready-to-serve*
41601130	Bean soup, mixed beans, home recipe, canned or ready-to-serve*
41601140	Bean soup, home recipe*
41601180	Bean and ham soup, home recipe*
41602020	Garbanzo bean or chickpea soup, home recipe, canned or ready-to-serve*
58100010	Burrito, taco, or quesadilla with egg and breakfast meat*
58100013	Burrito, taco, or quesadilla with egg and breakfast meat, from fast food*
58100015	Burrito, taco, or quesadilla with egg, potato, and breakfast meat*
58100017	Burrito, taco, or quesadilla with egg, potato, and breakfast meat, from fast food*
58100020	Burrito, taco, or quesadilla with egg, beans, and breakfast meat*
58104905	Taquito or flauta with egg and breakfast meat*
58106500	Pizza with meat, prepared from frozen, thin crust*
58106505	Pizza with meat, prepared from frozen, thick crust*
58106512	Pizza with pepperoni, from frozen, thin crust*
58106514	Pizza with pepperoni, from frozen, medium crust*
58106516	Pizza with pepperoni, from frozen, thick crust*
58106540	Pizza with pepperoni, from restaurant or fast food, NS as to type of crust*
58106550	Pizza with pepperoni, from restaurant or fast food, thin crust*
58106555	Pizza with pepperoni, from restaurant or fast food, medium crust*

Food code	Food description
58106560	Pizza with pepperoni, from restaurant or fast food, thick crust*
58106565	Pizza with pepperoni, stuffed crust*
58106570	Pizza with pepperoni, from school lunch, thin crust*
58106578	Pizza, with pepperoni, from school lunch, medium crust*
58106580	Pizza with pepperoni, from school lunch, thick crust*
58106602	Pizza with meat other than pepperoni, from frozen, thin crust*
58106604	Pizza with meat other than pepperoni, from frozen, medium crust*
58106606	Pizza with meat other than pepperoni, from frozen, thick crust*
58106610	Pizza with meat other than pepperoni, from restaurant or fast food, NS as to type of crust*
58106620	Pizza with meat other than pepperoni, from restaurant or fast food, thin crust*
58106625	Pizza with meat other than pepperoni, from restaurant or fast food, medium crust*
58106630	Pizza with meat other than pepperoni, from restaurant or fast food, thick crust*
58106633	Pizza, with meat other than pepperoni, stuffed crust*
58106634	Pizza, with meat other than pepperoni, from school lunch, medium crust*
58106635	Pizza, with meat other than pepperoni, from school lunch, thin crust*
58106636	Pizza, with meat other than pepperoni, from school lunch, thick crust*
58106640	Pizza with extra meat, NS as to type of crust*
58106650	Pizza with extra meat, thin crust*
58106655	Pizza with extra meat, medium crust*
58106660	Pizza with extra meat, thick crust*
58106720	Pizza with meat and vegetables, from restaurant or fast food, thin crust*
58106730	Pizza with meat and vegetables, from restaurant or fast food, thick crust*
58106736	Pizza with extra meat and extra vegetables, thin crust*
58106737	Pizza with extra meat and extra vegetables, thick crust*
58106738	Pizza with extra meat and extra vegetables, medium crust*
58106750	Pizza with meat and fruit, thin crust*
58106755	Pizza with meat and fruit, medium crust*
58106760	Pizza with meat and fruit, thick crust*
58107050	Pizza, no cheese, thin crust*
58107222	White pizza, cheese, with meat, thin crust*
58107232	White pizza, cheese, with meat and vegetables, thin crust*
58108010	Calzone, with meat and cheese*
58109030	Pizza, with meat, whole wheat thin crust*
58109120	Pizza, with meat, gluten-free thin crust*
58109130	Pizza, with meat, gluten-free thick crust*
58109210	Breakfast pizza with egg*
58116110	Meat turnover, Puerto Rican style*
58116210	Meat pie, Puerto Rican style*
58124230	Pastry, meat / poultry-filled*
58125110	Quiche with meat, poultry or fish*
58126130	Turnover, meat- and cheese-filled, no gravy*
58126290	Turnover, meat- and cheese-filled, lower in fat*
58126410	Turnover, filled with egg, meat, and cheese, lower in fat*
58127210	Croissant sandwich, filled with ham and cheese*
58127270	Croissant sandwich with sausage and egg*
58127290	Croissant sandwich with bacon and egg*
58127310	Croissant sandwich with ham, egg, and cheese*
58127330	Croissant sandwich with sausage, egg, and cheese*
58127350	Croissant sandwich with bacon, egg, and cheese*
58128000	Biscuit with gravy*

Food code	Food description
58128250	Dressing with meat and vegetables*
58132710	Spaghetti with tomato sauce and frankfurters or hot dogs*
58134610	Tortellini, meat-filled, with tomato sauce*
58134650	Tortellini, meat-filled, no sauce*
58134710	Tortellini, spinach-filled, with tomato sauce*
58134720	Tortellini, spinach-filled, no sauce*
58145160	Macaroni or noodles with cheese and frankfurters or hot dogs*
58146130	Pasta with carbonara sauce*
58148550	Macaroni or pasta salad with meat*
58156310	Rice with Spanish sausage, Puerto Rican style*
58160150	Red beans and rice*
58163410	Spanish rice, fat added in cooking*
58163420	Spanish rice, fat not added in cooking*
58163430	Spanish rice, NS as to fat added in cooking*
58163450	Spanish rice with ground beef*
58310310	Pancakes and sausage, frozen meal*
58404100	Rice and potato soup, Puerto Rican style*
71106000	Stewed potatoes, Puerto Rican style*
71301120	White potato, cooked, with ham and cheese*
71305040	Potato, scalloped, from fresh, with meat*
71305110	White potato, scalloped, with ham*
71402505	White potato, french fries, with cheese and bacon*
71411000	Potato skins, with cheese and bacon*
71507025	Potato, baked, peel not eaten, with meat*
71508025	Potato, baked, peel eaten, with meat*
71508060	White potato, stuffed, baked, peel eaten, stuffed with bacon and cheese*
71508070	White potato, stuffed, baked, peel not eaten, stuffed with bacon and cheese*
71602010	Potato salad, German style*
71803010	Potato chowder*
74415110	Puerto Rican seasoning with ham and tomato sauce*
75147000	Spinach salad, no dressing*
75414020	Mushrooms, stuffed*
77201210	Green plantain with cracklings, Puerto Rican style*
77230210	Cassava Pasteles, Puerto Rican style*
77250110	Stuffed tannier fritters, Puerto Rican style*
77272010	Puerto Rican pasteles*
77316010	Stuffed cabbage, with meat, Puerto Rican style*
77513010	Spanish stew*
77563010	Puerto Rican stew*
Protein and nutritional powders	
95201000	Nutritional powder mix (Carnation Instant Breakfast)
95201010	Nutritional powder mix, sugar free (Carnation Instant Breakfast)
95201200	Nutritional powder mix (EAS Whey Protein Powder)
95201300	Nutritional powder mix (EAS Soy Protein Powder)
95201500	Nutritional powder mix, high protein (Herbalife)
95201600	Nutritional powder mix (Isopure)
95201700	Nutritional powder mix (Kellogg's Special K20 Protein Water)
95202000	Nutritional powder mix (Muscle Milk)
95210000	Nutritional powder mix (Slim Fast)
95210020	Nutritional powder mix, high protein (Slim Fast)

Food code	Food description
95220000	Nutritional powder mix, NFS
95220010	Nutritional powder mix, high protein, NFS
95230000	Nutritional powder mix, whey based, NFS
95230010	Nutritional powder mix, protein, soy based, NFS
95230020	Nutritional powder mix, protein, light, NFS
95230030	Nutritional powder mix, protein, NFS
Protein beverages, RTD	
95103000	Nutritional drink or shake, ready-to-drink (Ensure)
95103010	Nutritional drink or shake, ready-to-drink (Ensure Plus)
95105000	Nutritional drink or shake, ready-to-drink (Kellogg's Special K Protein)
95106000	Nutritional drink or shake, ready-to-drink (Muscle Milk)
95106010	Nutritional drink or shake, ready-to-drink, light (Muscle Milk)
95110020	Nutritional drink or shake, high protein, ready-to-drink (Slim Fast)
95120000	Nutritional drink or shake, ready-to-drink, NFS
95120010	Nutritional drink or shake, high protein, ready-to-drink, NFS
95120020	Nutritional drink or shake, high protein, light, ready-to-drink, NFS
95120050	Nutritional drink or shake, liquid, soy-based
Sauces, cream-based	
13411000	White sauce, milk sauce
14650100	Cheese sauce
14650150	Cheese sauce made with lowfat cheese
14650160	Alfredo sauce
27113000	Beef with cream or white sauce*
27113200	Creamed chipped or dried beef*
27113300	Swedish meatballs with cream or white sauce*
27143000	Chicken or turkey with cream sauce*
27146200	Chicken or turkey with cheese sauce*
27150010	Fish with cream or white sauce, not tuna or lobster*
27150140	Clam sauce, white
27150200	Oyster sauce*
27211500	Beef and potatoes with cheese sauce*
27212300	Beef and noodles with cream or white sauce*
27213300	Beef and rice with cream sauce*
27220020	Ham and noodles with cream or white sauce*
27220190	Sausage and noodles with cream or white sauce*
27220520	Ham or pork and potatoes with cheese sauce*
27242300	Chicken or turkey and noodles with cream or white sauce*
27242310	Chicken or turkey and noodles with cheese sauce*
27250110	Scallops and noodles with cheese sauce*
27250126	Shrimp and noodles with cream or white sauce*
27250130	Shrimp and noodles with cheese sauce*
27250610	Tuna noodle casserole with cream or white sauce*
27311610	Beef, potatoes, and vegetables including carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27311620	Beef, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27311635	Beef, potatoes, and vegetables including carrots, broccoli, and/or dark-green leafy; cheese sauce*
27311640	Beef, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*

Food code	Food description
27315340	Beef, rice, and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27320030	Ham or pork, noodles and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27341035	Chicken or turkey, potatoes, and vegetables including carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27341040	Chicken or turkey, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27341045	Chicken or turkey, potatoes, and vegetables including carrots, broccoli, and/or dark-green leafy; cheese sauce*
27341050	Chicken or turkey, potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27343470	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27343480	Chicken or turkey, noodles, and vegetables excluding carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27343950	Chicken or turkey, noodles, and vegetables including carrots, broccoli, and/or dark-green leafy; cheese sauce*
27343960	Chicken or turkey, noodles, and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27345410	Chicken or turkey, rice, and vegetables including carrots, broccoli, and/or dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27345420	Chicken or turkey, rice, and vegetables excluding carrots, broccoli, and dark-green leafy; cream sauce, white sauce, or mushroom sauce*
27345440	Chicken or turkey, rice, and vegetables including carrots, broccoli, and/or dark-green leafy; cheese sauce*
27345450	Chicken or turkey, rice, and vegetables excluding carrots, broccoli, and dark-green leafy; cheese sauce*
27350080	Tuna noodle casserole with vegetables, cream or white sauce*
27350090	Fish, noodles, and vegetables including carrots, broccoli, and/or dark green leafy; cheese sauce*
27443120	Chicken or turkey a la king with vegetables excluding carrorts, broccoli, and dark-green leafy; no potatoes, cream, white, or soup-based sauce*
27446400	Chicken or turkey and vegetables including carrots, broccoli, and/or dark-green leafy; no potatoes, cheese sauce*
27446410	Chicken or turkey and vegetables excluding carrots, broccoli, and dark-green leafy; no potatoes, cheese sauce*
27510480	Cheeseburger (hamburger with cheese sauce), 1/4 lb meat, with grilled onions, on rye bun*
32101500	Egg, Benedict*
58131120	Ravioli, NS as to filling, with cream sauce*
58131330	Ravioli, meat-filled, with cream sauce*
58131535	Ravioli, cheese-filled, with cream sauce*
58131600	Ravioli, cheese and spinach-filled, with cream sauce*
58132800	Spaghetti with clam sauce, NS as to red or white*
58133120	Manicotti, cheese-filled, with tomato sauce, meatless*
58134110	Stuffed shells, cheese-filled, no sauce*
58134120	Stuffed shells, cheese-filled, with tomato sauce, meatless*
58134130	Stuffed shells, cheese-filled, with meat sauce*
58134310	Stuffed shells, with fish and/or shellfish, with tomato sauce*
58134660	Tortellini, cheese-filled, with cream sauce*
58146381	Pasta with cream sauce, restaurant*

Food code	Food description
58146382	Pasta with cream sauce, home recipe*
58146383	Pasta with cream sauce, ready-to-heat*
58146391	Pasta with cream sauce and added vegetables, restaurant*
58146392	Pasta with cream sauce and added vegetables, from home recipe*
58146393	Pasta with cream sauce and added vegetables, ready-to-heat*
58146401	Pasta with cream sauce and meat, restaurant*
58146402	Pasta with cream sauce and meat, home recipe*
58146403	Pasta with cream sauce and meat, ready-to-heat*
58146411	Pasta with cream sauce, meat, and added vegetables, restaurant*
58146412	Pasta with cream sauce, meat, and added vegetables, home recipe*
58146413	Pasta with cream sauce, meat, and added vegetables, ready-to-heat*
58146421	Pasta with cream sauce and poultry, restaurant*
58146422	Pasta with cream sauce and poultry, home recipe*
58146423	Pasta with cream sauce and poultry, ready-to-heat*
58146431	Pasta with cream sauce, poultry, and added vegetables, restaurant*
58146432	Pasta with cream sauce, poultry, and added vegetables, home recipe*
58146433	Pasta with cream sauce, poultry, and added vegetables, ready-to-heat*
58146441	Pasta with cream sauce and seafood, restaurant*
58146442	Pasta with cream sauce and seafood, home recipe*
58146443	Pasta with cream sauce and seafood, ready-to-heat*
58146451	Pasta with cream sauce, seafood, and added vegetables, restaurant*
58146452	Pasta with cream sauce, seafood, and added vegetables, home recipe*
58146682	Pasta, whole grain, with cream sauce, home recipe*
58146683	Pasta, whole grain, with cream sauce, ready-to-heat*
58146692	Pasta, whole grain, with cream sauce, and added vegetables, home recipe*
58146693	Pasta, whole grain, with cream sauce, and added vegetables, ready-to-heat*
58146702	Pasta, whole grain, with cream sauce and meat, home recipe*
58146723	Pasta, whole grain, with cream sauce and poultry, ready-to-heat*
58146732	Pasta, whole grain, with cream sauce, poultry, and added vegetables, home recipe*
58146741	Pasta, whole grain, with cream sauce and seafood, restaurant*
58147310	Macaroni, creamed*
58147330	Macaroni or noodles, creamed, with cheese*
58147350	Macaroni, creamed, with vegetables*
58164500	Rice, white, with cheese and/or cream based sauce, NS as to fat added in cooking*
58164510	Rice, white, with cheese and/or cream based sauce, fat not added in cooking*
58164520	Rice, white, with cheese and/or cream based sauce, fat added in cooking*
58165000	Rice, white, with vegetables, cheese and/or cream based sauce, NS as to fat added in cooking*
58165010	Rice, white, with vegetables, cheese and/or cream based sauce, fat not added in cooking*
58165020	Rice, white, with vegetables, cheese and/or cream based sauce, fat added in cooking*
58165400	Rice, brown, with vegetables, cheese and/or cream based sauce, NS as to fat added in cooking*
71507040	White potato, stuffed, baked, peel not eaten, stuffed with broccoli and cheese sauce*
71507050	White potato, stuffed, baked, peel not eaten, stuffed with meat in cream sauce*
71508050	White potato, stuffed, baked, peel eaten, stuffed with meat in cream sauce*
72125230	Spinach, NS as to form, creamed*
72125231	Spinach, from fresh, creamed*
72125250	Spinach, cooked, NS as to form, with cheese sauce*
72125260	Spinach and cheese casserole*
72201230	Broccoli, cooked, NS as to form, with cheese sauce*

Food code	Food description
72201231	Broccoli, cooked, from fresh, with cheese sauce*
72201250	Broccoli, cooked, NS as to form, with cream sauce*
72201251	Broccoli, cooked, from fresh, with cream sauce*
72202010	Broccoli casserole with noodles*
73102230	Carrots, cooked, NS as to form, creamed*
73102231	Carrots, cooked, from fresh, creamed*
75340160	Vegetable and pasta combinations with cream or cheese sauce, broccoli, pasta, carrots, corn, zucchini, peppers, cauliflower, peas, etc., cooked*
75401010	Asparagus, NS as to form, creamed or with cheese sauce*
75401011	Asparagus, from fresh, creamed or with cheese sauce*
75403010	Beans, string, green, NS as to form, creamed or with cheese sauce*
75403011	Beans, string, green, from fresh, creamed or with cheese sauce*
75406011	Brussels sprouts, from fresh, creamed*
75409010	Cauliflower, NS as to form, creamed*
75409011	Cauliflower, from fresh, creamed*
75410010	Celery, creamed*
75411030	Corn, cooked, NS as to form, with cream sauce, made with milk*
75414010	Mushrooms, NS as to form, creamed*
75414011	Mushrooms, from fresh, creamed*
75415010	Onions, NS as to form, creamed*
75417010	Peas, NS as to form, creamed*
75418040	Squash, summer, casserole, with cheese sauce*
75440500	Vegetable combinations, including carrots, broccoli, and/or dark-green leafy; cooked, with cheese sauce*
75440510	Vegetable combinations, excluding carrots, broccoli, and dark-green leafy; cooked, with cheese sauce*
75450500	Vegetable combination, including carrots, broccoli, and/or dark-green leafy; cooked, with cream sauce*
75450510	Vegetable combination, excluding carrots, broccoli, and dark-green leafy; cooked, with cream sauce*
81301020	Lemon-butter sauce
81302010	Hollandaise sauce
81302060	Horseradish sauce
Snack foods	
51184000	Breadsticks, hard, NFS
51185000	Croutons
51187000	Melba toast
51188500	Zwieback toast
53710400	Cereal or granola bar (General Mills Fiber One Chewy Bar)
53710500	Cereal or granola bar (Kellogg's Nutri-Grain Cereal Bar)
53710502	Cereal or granola bar (Kellogg's Nutri-Grain Yogurt Bar)
53710504	Cereal or granola bar (Kellogg's Nutri-Grain Fruit and Nut Bar)
53710600	Milk 'n Cereal bar
53710700	Cereal or granola bar (Kellogg's Special K bar)
53710900	Cereal or granola bar (General Mills Nature Valley Chewy Trail Mix)
53710902	Cereal or granola bar, with yogurt coating (General Mills Nature Valley Chewy Granola Bar)
53710904	Cereal or granola bar (General Mills Nature Valley Sweet and Salty Granola Bar)
53710906	Cereal or granola bar (General Mills Nature Valley Crunchy Granola Bar)
53711000	Cereal or granola bar (Quaker Chewy Granola Bar)
53711002	Cereal or granola bar (Quaker Chewy 90 Calorie Granola Bar)

Food code	Food description
53711004	Cereal or granola bar (Quaker Chewy 25% Less Sugar Granola Bar)
53711006	Cereal or granola bar (Quaker Chewy Dipps Granola Bar)
53711100	Cereal or granola bar (Quaker Granola Bites)
53712000	Snack bar, oatmeal
53712100	Cereal or Granola bar, NFS
53712200	Cereal or granola bar, lowfat, NFS
53712210	Cereal or granola bar, nonfat
53713100	Cereal or granola bar, peanuts , oats, sugar, wheat germ
53714200	Cereal or granola bar, chocolate coated, NFS
53714210	Cereal or granola bar, with coconut, chocolate coated
53714220	Cereal or granola bar with nuts, chocolate coated
53714230	Cereal or granola bar, oats, nuts, coated with non-chocolate coating
53714250	Cereal or granola bar, coated with non-chocolate coating
53714300	Cereal or granola bar, high fiber, coated with non-chocolate yogurt coating
53714400	Cereal or granola bar, with rice cereal
53714500	Breakfast bar, NFS
53714520	Breakfast bar, cereal crust with fruit filling, lowfat
54001000	Crackers, NFS
54102010	Graham crackers
54102015	Graham crackers (Teddy Grahams)
54102020	Graham crackers, chocolate covered
54102050	Crackers, oatmeal
54102060	Crackers, Cuban
54102100	Graham crackers, reduced fat
54102200	Graham crackers, sandwich, with filling
54103000	Crackers, breakfast biscuit
54200100	Crackers, butter, reduced sodium
54202010	Crackers, saltine, low sodium
54202020	Crackers, saltine, reduced sodium
54203010	Crackers, toast thins (rye, wheat, white flour), low sodium
54204010	Cracker, 100% whole wheat, low sodium
54204020	Crackers, wheat, reduced sodium
54204030	Crackers, woven wheat, reduced sodium
54205010	Cracker, snack, low sodium
54205100	Cracker, snack, reduced fat, reduced sodium
54301000	Cracker, snack
54301010	Crackers, butter, plain
54301020	Crackers, butter, flavored
54301030	Crackers, butter (Ritz)
54301100	Crackers, butter, reduced fat
54304000	Crackers, cheese
54304005	Crackers, cheese (Cheez-It)
54304020	Crackers, cheese (Goldfish)
54304100	Crackers, cheese, reduced fat
54304150	Crackers, cheese, whole grain
54304500	Cracker, high fiber, no added fat
54305000	Crispbread, wheat, no added fat
54305010	Crackers, crispbread
54305020	Crackers, flatbread
54307000	Crackers, matzo

Food code	Food description
54308000	Crackers, milk
54313000	Crackers, oyster
54318000	Chips, rice
54318500	Rice cake
54319000	Crackers, rice
54319005	Crackers, rice and nuts
54319010	Puffed rice cake
54319020	Popcorn cake
54322000	Crispbread, rye, no added fat
54325000	Crackers, saltine
54325010	Crackers, saltine, reduced fat
54325050	Crackers, saltine, whole wheat
54325060	Crackers, saltine, multigrain
54326000	Crackers, multigrain
54327950	Crackers, cylindrical, peanut-butter filled
54328000	Crackers, sandwich
54328100	Crackers, sandwich, peanut butter filled
54328105	Crackers, sandwich, peanut butter filled (Ritz)
54328110	Crackers, sandwich, reduced fat, peanut butter filled
54328120	Crackers, whole grain, sandwich, peanut butter filled
54328200	Crackers, sandwich, cheese filled
54328210	Crackers, sandwich, cheese filled (Ritz)
54334000	Crackers, toast thins (rye, pumpernickel, white flour)
54336000	Crackers, water
54336100	Crackers, wonton
54337000	Cracker, 100% whole wheat
54337010	Crackers, woven wheat
54337020	Crackers, woven wheat, plain (Triscuit)
54337030	Crackers, woven wheat, flavored (Triscuit)
54337050	Cracker, 100% whole wheat, reduced fat
54337060	Crackers, woven wheat, reduced fat
54338000	Crackers, wheat
54338010	Crackers, wheat, plain (Wheat Thins)
54338020	Crackers, wheat, flavored (Wheat Thins)
54338100	Crackers, wheat, reduced fat
54339000	Crackers, corn
54340100	Crackers, gluten free, plain
54340110	Crackers, gluten free, flavored
54401010	Salty snacks, corn or cornmeal base, nuts or nuggets, toasted
54401011	Corn nuts
54401020	Salty snacks, corn or cornmeal base, corn chips, corn-cheese chips
54401021	Corn chips, plain
54401026	Corn chips, flavored
54401031	Corn chips, plain (Fritos)
54401035	Corn chips, flavored (Fritos)
54401050	Salty snacks, corn or cornmeal base, corn puffs and twists; corn-cheese puffs and twists
54401055	Cheese flavored corn snacks
54401065	Cheese flavored corn snacks, reduced fat
54401075	Tortilla chips, plain
54401080	Salty snacks, corn or cornmeal base, tortilla chips

Food code	Food description
54401081	Cheese flavored corn snacks (Cheetos)
54401085	Tortilla chips, flavored
54401090	Corn chips, reduced sodium
54401100	Salty snacks, corn or cornmeal base, tortilla chips, light (baked with less oil)
54401110	Tortilla chips, nacho cheese flavor (Doritos)
54401111	Tortilla chips, cool ranch flavor (Doritos)
54401112	Tortilla chips, other flavors (Doritos)
54401120	Salty snacks, corn or cornmeal base, tortilla chips, fat free, made with Olean
54401121	Tortilla chips, reduced fat, plain
54401122	Tortilla chips, reduced fat, flavored
54401150	Salty snacks, corn or cornmeal base, tortilla chips, lowfat, baked without fat
54401170	Tortilla chips, low fat, unsalted
54401210	Salty snacks, corn based puffs and twists, cheese puffs and twists, lowfat
54402080	Tortilla chips, reduced sodium
54402200	Snack mix
54402600	Salty snacks, multigrain, whole grain, chips (made with whole corn, whole wheat, rice flour, and whole oat flour)
54402610	Potato chips, restructured, multigrain
54402700	Pita chips
54404010	Popcorn chips, other flavors
54404020	Popcorn chips, sweet flavors
54406010	Onion flavored rings
54406200	Shrimp chips
54408000	Pretzels, NFS
54408010	Pretzels, hard
54408015	Pretzels, hard, NFS
54408016	Pretzels, hard, plain, salted
54408017	Pretzels, hard, plain, lightly salted
54408030	Pretzels, hard, plain, unsalted
54408035	Pretzels, hard, flavored
54408070	Pretzels, hard, multigrain
54408080	Pretzel, gluten free
54408081	Pretzels, hard, plain, gluten free
54408082	Pretzels, hard, flavored, gluten free
54408105	Pretzel chips, hard, plain
54408110	Pretzel chips, hard, flavored
54408190	Pretzels, hard, coated, NFS
54408200	Pretzels, hard, chocolate coated
54408210	Pretzels, hard, white chocolate coated
54408250	Pretzels, hard, yogurt coated
54408290	Pretzels, hard, filled, NFS
54408300	Pretzels, hard, cheese filled
54408310	Pretzels, hard, peanut butter filled
54420010	Multigrain mixture, pretzels, cereal and/or crackers, nuts
54420200	Multigrain mixture, bread sticks, sesame nuggets, pretzels, rye chips
54420210	Multigrain chips (Sun Chips)
54420220	Snack mix, plain (Chex Mix)
54440010	Bagel chips
54440020	Cracker chips
56116000	Noodles, chow mein

Food code	Food description
58104090	Nachos with cheese and sour cream*
58104120	Nachos with cheese*
58104130	Nachos with meat and cheese*
58104150	Nachos with chicken and cheese*
58104160	Nachos with chili*
58104180	Nachos with meat, cheese, and sour cream*
58104190	Nachos with chicken, cheese, and sour cream*
71200300	Potato chips, restructured, plain
71200310	Potato chips, restructured, flavored
71200400	Potato chips, baked, plain
71200410	Potato chips, baked, flavored
71201100	White potato, chips, restructured
71201200	Potato chips, restructured, reduced fat, lightly salted
71201210	Potato chips, restructured, fat free
71201250	White potato, chips, restructured, baked
71202510	Potato chips, restructured, lightly salted
71203020	Potato chips, popped, flavored
71204000	Potato puffs, cheese-filled
71205000	White potato, sticks
71205020	Potato sticks, plain
71205030	Potato sticks, flavored
71205040	Potato sticks, fry shaped
71220000	Vegetable chips

*Only the proposed food use component of the food was included towards the EDI.

Exhibit I. GRAS Expert Panel Report

Expert Panel Report on the Generally Recognized As Safe (GRAS) Conclusion for Corn Protein

April 23, 2019

Introduction

Cargill intends to use corn protein as a source of protein, and for functional uses such as thickening, water absorption, fat/oil absorption, gelation, and solid fat emulsification in a variety of food categories. A panel of independent experts (the "Expert Panel"), qualified by their scientific training and relevant national and international experience to evaluate the safety of food ingredients, was convened to conduct an independent, critical and comprehensive evaluation of the available technical and safety information on corn protein and to determine if the proposed uses as a food ingredient are safe and suitable and can be considered Generally Recognized As Safe (GRAS) based on scientific procedures in accordance with 21 CFR §170.30(a) and (b). The Expert Panel consisted of James R. Coughlin, Ph.D., CFS, Carol Knight, Ph.D, and Michael Carakostas, DVM, Ph.D.

A technical dossier, "Safety Evaluation Dossier Supporting a Generally Recognized As Safe (GRAS) Conclusion for Corn Protein" (originally issued 19 May 2017; revised 6 July 2017 and 18 April 2019), was prepared by Toxicology Regulatory Services, Inc. (TRS) and made available to the Expert Panel. The Dossier contained data and information on the characterization, method of manufacture, product specifications, composition and stability, analytical testing, proposed levels of use, consumer exposure estimates, and safety assessment of corn protein. The Expert Panel, independently and collectively, critically evaluated this document and other publicly available information deemed appropriate and relevant to the GRAS status of corn protein. The Expert Panel convened by telephone with Dr. Andrey I. Nikiforov (TRS, Inc.) and Ms. Marisa O. Rihner (TRS, Inc.) on 2 June 2017.

The Expert Panel unanimously concluded that the proposed uses of corn protein, manufactured consistent with current Good Manufacturing Practices (cGMPs) and meeting appropriate food-grade specifications, are safe and suitable and GRAS based on scientific procedures. A summary of the basis for this conclusion appears below.

Basis for GRAS Determination of the Proposed Uses of Corn Protein

GRAS Substance Identity and Characterization

Cargill's corn protein is composed of at least 65% protein; the remainder being carbohydrates, fat/oil, ash, organic acid, and water. It typically appears as a pale yellow to light tan powder. Compositional data and detailed nutritional analysis data are available for multiple batches of corn protein and its raw material.

Method of Manufacture

Cargill's corn protein is manufactured in accordance with current good manufacturing practices (cGMP) for food (21 CFR Part 110). Briefly, the corn protein product is obtained *via* wet milling of maize to yield corn gluten meal, from which protein is recovered, dried, extracted, and heated to remove residual solvent. The resulting powder, consisting of 88% solids, may be milled, physically processed or sprayed with food grade oil, lecithin or other safe and suitable processing aid prior to bulk packaging. All raw materials and processing aids used in the manufacture of corn protein are considered safe and appropriate for use in foods.

Conformance to proposed specifications and consistency in the manufacturing process of corn protein has been demonstrated by the analyses of multiple non-consecutive lots of commercially representative corn protein. In addition to food grade specifications, appropriate food safety and quality controls are in place to ensure that potential contaminants (e.g., mycotoxins and pesticides) are absent from the product or below levels of safety concern.

Cargill's corn protein product is considered to be stable for 24 months when stored under recommended storage conditions, *i.e.*, in a cool (20-30°C), dry location and in the original sealed package away from odorous material. There are no known degradation products of safety concern associated with corn protein.

Intended Use and Consumer Exposure

Corn protein is intended for use as a source of protein in a variety of food categories, and for such functional effects as thickening, water absorption, fat/oil absorption, gelation, and solid fat emulsification at levels ranging from 0.08% to 40%, depending on the product.

Based on these use levels and daily consumption estimates derived from the NHANES 2013-2014 and 2015-2016 database (NCHS, 2016, 2018), the conservative estimated

daily intake (EDI) of corn protein from all proposed uses (and assuming the maximum proposed use level for each food category) on a "per user" basis is less than or equal to 0.22 g/kg bw/day at the mean and 0.49 g/kg bw/day at the 90th percentile (equivalent to 12.5 and 24.3 g/day, respectively). On a body weight basis, the highest "per user" mean and 90th percentile intake estimates for corn protein are among children 1-6 years at 0.68 g/kg bw/day and 1.18 g/kg bw/day, respectively.

There are no safety concerns associated with the worst-case, conservative intake estimates for corn protein from proposed food categories and use levels. Because the proposed uses of corn protein will not result in an increase in the overall consumption of protein, but simply will provide an alternative source of well-characterized protein from corn for use in food, cumulative intake analysis is not considered necessary.

Safety Evaluation

Regulatory Status of Similar Materials

To date, GRAS conclusions have been reached for several plant protein isolates and concentrates [e.g., GRN No. 26 (isolated wheat protein); GRN No. 134 (soy protein); GRN No. 609 (rice protein); GRN 386 (canola protein isolate and hydrolyzed canola protein isolate); GRN No. 447 (potato protein isolates); GRN No. 575 (oat protein), GRN No. 581 (pea protein), and GRN No. 608 and 788 (pea protein concentrate); GRN No. 683 (canola protein isolate); and GRN 684 (mung bean protein isolate)] based on data and information confirming that there is a history of safe consumption of the source plants and their proteins, there are no toxicologically or clinically relevant effects observed in studies where these plant proteins were fed to animals or humans, and estimated consumer intake levels for these plant proteins are consistent with established Recommended Dietary Allowances (RDAs) (IOM 2002/2005) or safe consumption values (WHO, 2007) for protein.

Overview of Safety Database Supporting Safety Evaluation of Corn Protein

Corn [also referred to as "maize" (*Zea mays*) and belonging to the grass family (Gramineae)] has been part of the normal human diet for centuries, with the earliest recorded presence of the crop in Mexico reported as early as 8700 BP (Piperno, 2011). With the long history of safe human consumption of corn and its proteins, traditional toxicology and clinical safety studies on corn protein are not available in the published literature, but there are no known reports of adverse health effects related to corn or its proteins. No adverse effects were reported in animal studies with a major corn protein, zein hydrolysate (ZeinH), which has been studied for its potential to stimulate glucagon-like peptide-1 (GLP-1) secretion (Hira et al., 2009; Higuchi et al., 2013).

The human metabolic pathway for protein and amino acids is well understood and would be similar for corn protein supporting its safety. Briefly, dietary proteins undergo acid-catalyzed or enzymatic hydrolysis to yield individual amino acids which are further broken down by deamination, yielding amino acid carbon skeletons (α-keto acids) that can be converted to common metabolic intermediates (Voet and Voet, 1995). Amino groups resulting from deamination are converted either to ammonia or to the amino group of aspartate which may be excreted in the urine unchanged or as urea (Voet and Voet, 1995).

Food allergy to maize, although relatively rare, has been reported in the literature (Scibilia et al., 2008; Pastorello et al., 2009; Goodman et al., 2013; Krishnan and Chen, 2013). The primary maize allergen responsible for food-induced allergic reactions is a nonspecific lipid transfer protein (LTP), which is considered a pathogenesis-related protein that may be induced by stress (Goodman et al., 2013; Pastorello et al., 2000; Pastorello et al., 2009). Corn (maize) is not listed as one of eight major allergen groups by the FDA under the Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II); however, formulated finished food product ingredient lists will declare the presence of a corn protein as a corn-derived ingredient.

Safety Evaluation of Potential Corn Protein Impurities and Contaminants

Current food-grade specifications and quality controls for corn protein ensure that potential impurities and contaminants of safety concern are absent from the processed material or below levels of safety concern based on relevant Acceptable Daily Intakes (ADIs), Tolerable Daily Intakes (TDIs), or Provisional Maximum Tolerable Daily Intakes (PMTDIs). As discussed in the corn protein GRAS Dossier, adequate margins of safety compared to applicable ADI, TDI or PMTDI values exist for each of these impurities and contaminants at maximum potential exposure levels using worst-case, conservative estimates of corn protein intake among the total population and population subgroups.

Nutritional and Safety Considerations for Protein Intake

Corn protein is intended to be an alternative source of protein for current uses in food and is not expected to result in an increase in the overall consumption of protein. The minimum daily protein intake values recommended by the FDA (Daily Reference Values, DRV) and Institute of Medicine (IOM) (Recommended Dietary Allowances, RDA) are 50 g/day or 56/46 g/day (males/females) for adults, respectively (FDA, 2016; IOM, 2002/2005), while USDA reports that the 90th percentile intake of protein from food and beverages ranges from 68.3-139.1 g/day (USDA, 2015a). Therefore, even at the most

conservative, upper range of estimated intake for the total US population (i.e., 24.3 g/day at the 90th percentile per user intake estimate) based on NHANES dietary survey data, the proposed uses of corn protein would contribute only a small portion of the background protein consumption in the US, or the dietary protein recommendations of the FDA and IOM. In addition, because consumers are not likely to consume all corn protein-containing products at the 90th percentile of intake, even larger margins of safety would be achieved based on more typical consumption patterns.

Potential adverse effects associated with consumption of extremely high levels of protein have been reported in the literature; however, the proposed food uses of corn protein are expected to result in consumption amounts well below the safe protein ingestion levels recommended by the WHO (2007) (i.e., 33-66 g/day for adults depending on body weight, 10.8-17.1 g/day for children ages 1-6, and 25.9-41.0 g/day for children ages 7-12).

Conclusion

We, the independent qualified members of the Expert Panel, have individually and collectively critically evaluated the data and information summarized above, and other data and information that we deemed pertinent to the safety of the proposed uses of corn protein as a source of protein, and for functional uses such as thickening, water absorption, fat/oil absorption, gelation, and solid fat emulsification in a variety of food categories. We unanimously conclude that the proposed uses of corn protein, produced consistent with current good manufacturing practices (cGMPs) and meeting appropriate food grade specifications, are safe and suitable and Generally Recognized As Safe (GRAS) based on scientific procedures.

It is our opinion that other qualified experts would concur with these conclusions.

Michael Carakostas, DVM, Ph.D. MC Scientific Consulting, LLC	Date
James R. Coughlin, Ph.D., CFS Coughlin & Associates	Date
Carol Knight, Ph.D. Knight International	Date

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It is our opinion that other qualified experts would concur with these conclusions.

[redacted]

Michael Carakostas, DVM, Ph.D.
MC Scientific Consulting, LLC

4-Apr. 2019
Date

[redacted]

James R. Coughlin, Ph.D., CF
Coughlin & Associates

23 April 2019
Date

[redacted]

Carol Knight, Ph.D.
Knight International

23 April 2019
Date

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GRN (GRAS Notification) No. 26: isolated wheat protein. Received on July 8, 1999 by Manildra Group. Agency Response Letter dated December 16, 1999.

GRN (GRAS Notification) No. 134: soy protein hydrolyzate with enzyme-modified lecithin. Filed on July 14, 2003 by Kyowa Hakko USA, Inc. Agency Response Letter dated January 8, 2004.

GRN (GRAS Notification) No. 386: canola protein isolate and hydrolyzed canola protein isolate. Filed on June 22, 2011 by BioExx Specialty Proteins, Ltd. Agency Response Letter dated December 28, 2011.

GRN (GRAS Notification) No. 447: potato protein isolates. Filed on November 5, 2012 by Solanic B.V., an AVEBE Group Company. Agency Response Letter dated July 3, 2013.

GRN (GRAS Notification) No. 575: oat protein. Filed on April 15, 2015 by Tate and Lyle. Agency Response Letter dated September 18, 2015.

GRN (GRAS Notification) No. 581: pea protein. Filed on June 18, 2015 by World Food Processing, LLC. Agency Response Letter dated March 20, 2016.

GRN (GRAS Notification) No. 608: pea protein concentrate. Filed on December 7, 2015 by Axiom Foods, Inc. and SPRIM Strategy and Intelligent Innovation. Agency Response Letter dated May 27, 2016.

GRN (GRAS Notification) No. 609: rice protein. Filed on November 16, 2015 (amended February 19, 2016) by Soni & Associates, Inc. Agency Response Letter dated June 6, 2016.

GRN (GRAS Notification) No. 683: canola protein isolate. Filed on January 10, 2017 for DSM Innovation Company. Agency Response Letter dated May 10, 2017.

GRN (GRAS Notification) No. 684: mung bean protein isolate. Filed on January 13, 2017 (amended March 7, 9, and 24, 2017) for Hampton Creek, Inc. Agency Response Letter dated August 4, 2017.

GRN (GRAS Notification) No. 788: pea protein concentrate. Filed on July 6, 2018 for Yantai Oriental Protein Tech Co., Ltd. Agency Response Letter dated October 12, 2018.

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Bonnette, Richard

Subject: FW: Your submission to the FDA GRAS notification program for corn protein - uses in USDA regulated products

From: Andrey I. Nikiforov <ANikiforov@ToxRegServ.com>
Sent: Tuesday, July 30, 2019 11:25 AM
To: Bonnette, Richard <Richard.Bonnette@fda.hhs.gov>
Cc: Marisa O. Rihner <MRihner@ToxRegServ.com>; Witty Brathwaite <Witty_Brathwaite@cargill.com>
Subject: RE: Your submission to the FDA GRAS notification program for corn protein - uses in USDA regulated products

Dear Richard,

Following discussion with the sponsor, please remove the meat and poultry intended uses ("Processed meats") from the scope of our submission (dated May 14, 2019). TRS and Cargill will work directly with Kristina or Melanie of FSIS to develop the data sufficient to enable use of corn protein in USDA-regulated products.

Please contact me with any questions. Thank you.

Best regards,

Andrey

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Responses to FDA Questions on Cargill's GRAS Notice (GRN) 874 for Corn Protein

January 10, 2020

Chemistry Questions:

1. The notifier indicates that corn protein is a pale yellow to light tan powder. The notifier should include a statement indicating that corn protein is not intended to be used as a color additive.

   Response:

   Cargill confirms that corn protein is not intended to be used as a color additive.

2. The notifier should provide a representative chromatogram for their corn protein product.

   Response:

   Cargill is unable to provide a representative chromatogram for their corn protein product because it is insoluble in water.

3. The notifier indicates that corn gluten meal is obtained through the wet milling of maize. However, the notifier does not provide any information on the source of the corn. The notifier should provide information stating from where and how the corn is sourced, including information on the use of fertilizers.

   Response:

   Currently, the source of the corn from which the corn gluten meal raw material is obtained is the US. However, there is possibility that the raw material may be sourced and processed into final product from outside the US in the future. Given the complexity of the US supply chain for corn, it is difficult to state precisely where and how the corn is sourced and the fertilizers used. However, Cargill's corn protein product is analyzed for potential contaminants, including heavy metals, mycotoxins, and pesticide residues and appropriate food safety and quality controls are in place to ensure that these contaminants are absent from the product or below levels of safety concern.

4. The notifier indicates that a processing aid may be used to adjust the pH of the insoluble protein and that an oxidizing agent is used in the filter rinse step, as well as to diminish the levels of sulfur dioxide. However, the identities of these are not provided. The notifier should indicate the processing aids and oxidizing agents used in the manufacture of corn protein.

   Response:

   The specific identities of the processing aids and oxidizing agents were not specified to maintain flexibility in the manufacturing process GRAS narrative in case any changes were made to these substances in the future. Only safe and suitable processing aids are and will be used in the manufacture of corn protein. Currently, hydrogen peroxide is used in the filter rinse step, as well as to diminish the levels of sulfur dioxide.

5. The notifier should provide more detail in their manufacturing process (*e.g.*, indicate the desired pH range for the pH adjustment steps, provide times and temperatures for the jet cooking step, provide more information as to how sulfur dioxide is formed and the times and temperatures used in that step).

   Response:

   In the interest of maintaining Cargill confidential business and proprietary information, only the details in the manufacturing process that were sufficient to permit the appropriate safety evaluation of corn protein were included in the GRAS Notice.

   With respect to the sulfur dioxide, as described in the GRAS Notice, corn protein is produced from the raw material, corn gluten meal, which is obtained from the wet milling of maize. After cleaning and removal of foreign material, the maize grain is usually steeped in water with sulfur dioxide (SO_2), derived from sodium bisulfite, ammonium bisulfite, or a sulfur burner. The role of sulfur dioxide is to weaken the glutelin matrix by breaking inter- and intramolecular disulfide bonds. The bisulfite is also added in the heavy gluten tank to maintain microbial loading. Sulfur dioxide ensures that sulfurous acid is present to suppress wild yeasts and bacteria. The vast majority of the sulfite does not partition with the heavy gluten wet solids. Most sulfur dioxide is consumed or returned to steeping, while some goes with the fiber. Internal analyses of the raw material, destarched corn gluten meal, show levels of free sulfites ranging from 600-900 ppm. However, this is limited in the corn protein ingredient to no more than 100 ppm.

6. The notifier indicated that corn protein is composed of at least 65% protein, with the remainder being carbohydrates, fat/oil, ash, organic acids, and water. The notifier provided specifications for protein and loss on drying. The notifier should consider proposing specifications for total carbohydrates, ash, and fat. These specifications have been provided for other proteins referenced in the GRAS notice. If specifications are included for these parameters, the notifier should provide data from the analysis of three non-consecutive batches to demonstrate conformance with the stated specifications.

   Response:

   Cargill chooses not to propose specifications for total carbohydrates, ash, and fat for their corn protein product. The specifications proposed are sufficient to characterize and represent the intended product of commerce.

7. The notifier indicated that the specification for ethanol was < 60 g/kg. This is a large residual level for ethanol. The notifier should confirm that the units for this specification are correct.

   Response:

   Cargill confirms that the specification for ethanol is set for no more than 60 g/kg of product. The GRAS Notice provides appropriate discussion of the safety of potential intake of ethanol residues by corn protein consumers.

8. The notifier provided specifications for heavy metals as lead, lead, and mercury. Since this ingredient is grown in soil, the notifier should include specifications for cadmium and arsenic as well. The notifier should provide data from the analysis of three non-consecutive batches to demonstrate conformance with the stated specifications for cadmium and arsenic. The specification for heavy metals as lead results in a high limit for lead. We note that the exposure to lead should be kept as low as possible. Since the heavy metals as lead method is more qualitative than quantitative, and the notifier has proposed a limit for lead per se, we will not consider the heavy metals as lead specification further.

   Response:

   Cargill proposes a specification of no more than 1 ppm for each of cadmium and arsenic, and Table 1 summarizes the analytical results from multiple non-consecutive batches of corn protein to demonstrate conformance with this specification.

Table 1. Analytical Results for Cadmium and Arsenic in Multiple Non-Consecutive Batches of Corn Protein

Parameter	Specifications	181218-CP-P-299	180717-CP-P-269-1	190103-CP-P-302	190104-CP-P-303	190107-CP-P-304	190108-CP-P-305
Cadmium (ppm)	< 1	0.019	0.014	0.021	0.017	0.014	0.020
Arsenic (ppm)	< 1	< 0.010	< 0.010	0.010	< 0.010	< 0.010	< 0.010

9. The notifier indicated that many non-standard methods or standard methods that had been modified were used in the analysis of certain parameters in Tables 1, 3, and 5. The notifier should indicate that all analytical methods used to analyze the batches for conformance with the stated parameters have been validated for that particular purpose.

   Response:

   Cargill confirms that all analytical methods used to analyze the batches for conformance with the stated parameters in Tables 1, 3 and 5 have been validated for that particular purpose.

10. The notifier provided an exposure estimate for corn protein based on the proposed uses in various food categories and the maximum use level for corn protein in those categories. We note that this exposure estimate included processed meats, a category that was removed from the intended uses. The notifier also indicated that corn protein is intended to serve as an alternative source of protein and that the proposed uses of corn protein will not result in an overall increase in the consumption of protein. The latter is an acceptable argument for exposure to corn protein. If the notifier chooses to revise the exposure, they should remove the use of corn protein in processed meats.

    Response:

    Cargill chooses not to revise the exposure estimate at this time. The GRAS Notice provides sufficient discussion of the safety of corn protein under the intended conditions of use based on current exposure estimates, even with the removal of the intended use of corn protein in processed meats.

Responses to FDA Questions on Cargill's GRAS Notice (GRN) 874 for Corn Protein

January 10, 2020

Toxicology Questions:

1. Your notification states (page 30) that "[a] comprehensive literature search was conducted to confirm that no relevant safety studies are available for corn protein". Yet, you do not discuss any of the published studies on the safety and suitability of corn gluten meal as feed for pigs, ruminants, chickens *etc.* in the notice. Please provide a discussion on the relevance, or lack thereof, of this published information to the safety evaluation of your substance.

   Response:

   As discussed in the corn protein GRAS Notice, corn gluten (CAS Reg. No. 66071-96-3), also known as corn gluten meal (CGM), is the principal protein component of corn endosperm, consisting mainly of zein and glutelin, and was GRAS-affirmed by the FDA for use as a nutrient supplement and a texturizer in food at levels not to exceed current good manufacturing practice (21 CFR §184.1321). Therefore, the GRAS status of CGM for use in human foods supports its safety as the raw material used to produce corn protein.

   CGM is more commonly utilized as an animal feed ingredient, with the Association of American Feed Control Officials (AAFCO) definition for CGM (international feed number 48.15) originally adopted in 1936 and amended in 1960 (AAFCO Publication 2020). As such, the safety and suitability of CGM as animal feed has been extensively studied in several mammalian species. These studies (*e.g.*, De Gracia *et al.*, 1989; Holter *et al*., 1992; Cozzi and Polan, 1994) demonstrated that dietary CGM administration did not cause adverse toxicological effects or changes in safety-related endpoints (*e.g.*, body weight gain). In its review of animal feeding studies, the FDA Select Committee of GRAS Substances (SCOGS) (FDA, 1981) noted that protein products such as corn gluten may not support adequate growth when used as the sole source of dietary protein (FDA, 1981). However, owing to the small contribution of these products to the *per capita* intake of protein from all sources, the poor performance of some animals studied was considered to have little relevance to the evaluation of the proteins as food ingredients in human diets (FDA, 1981). As discussed in the corn protein GRAS Notice, the proposed uses of corn protein would contribute only a small portion of the background protein consumption in the US (*i.e.*, the conservative per user 90th percentile intake estimate for corn protein is 24.3 g/day compared to the 90th percentile intake of protein from food and beverages ranging from 68.3-139.1 g/day (USDA, 2015), with dietary protein derived from a range of sources (*e.g.*, meat and meat products, grains and grain-based products, and milk and dairy products).

   In consideration of the information presented above, Cargill concludes that the available data and information corroborate the FDA GRAS affirmation for corn gluten meal as a human food ingredient and substantiate its safety and suitability as the raw material used to produce Cargill's corn protein.

2. Notifications such as GRN 684 (mung bean protein isolate), GRN 683 (canola protein isolate), GRN 581 (pea protein), and GRN 447 (potato protein isolate) each presented experimental evidence of the digestibility of proteins *in vitro* and/or nitrogen absorption or other measures of digestibility in animal

and/or clinical experiments. Please provide a comprehensive discussion of the digestibility, protein value, and nitrogen absorption in humans based on relevant studies in the literature.

Response:

Protein digestibility-corrected amino acid score (PDCAAS) values for maize have been reported to range from 0.42 (Jin *et al*., 2014) to 0.60 (Naves *et al*., 2011). Mean protein digestibility values of maize, whole corn, and corn cereal in humans have been reported to be 85%, 87%, and 70%, respectively (FAO, 1991). It is expected that corn protein digestibility values in humans will be in a similar range. This conclusion is supported by data demonstrating that the mean digestible indispensable amino acid scores (DIAAS) for corn (84-91% determined by three different methods) were similar to DIAAS values for corn gluten meal (84-93%), the raw material used to produce corn protein (Kim *et al*., 2012).

As discussed in the GRAS Notice for corn protein, the amino acid profile of corn protein is qualitatively similar to other commonly consumed plant-derived proteins, with lower amounts of lysine but much higher levels of leucine and glutamine. Studies in children fed maize diets have reported lower nitrogen balance results compared to those fed milk and other vegetable proteins (FAO, 1992; Ch. 8), an effect which is attributed to the lower lysine content of maize protein (Mariscal-Landin *et al*., 2014). Improvements to nitrogen absorption and retention in humans receiving maize diets have been observed following dietary supplementation with tryptophan and lysine, as well as adjusting the proportion of maize in the total diet (FAO, 1992; Ch. 8).

Tables 2 and 3 below summarize the essential amino acid scores of a number of plant- and animal-based protein sources based on recommendations for adults and young children, respectively (Berrazaga *et al.*, 2019). Essential amino acid scores for maize protein are generally similar to those of soy protein and pea protein, with the exception of much lower lysine scores, but much higher methionine + cysteine scores. Maize protein also fares better than wheat protein in all essential amino acid scores.

As discussed above, the proposed uses of corn protein would contribute only a small portion of the background protein consumption in the US (*i.e.*, the conservative per user 90th percentile intake estimate for corn protein is 24.3 g/day compared to the 90th percentile intake of protein from food and beverages ranging from 68.3-139.1 g/day (USDA, 2015), with dietary protein derived from a range of sources (*e.g.*, meat and meat products, grains and grain-based products, and milk and dairy products). Therefore, the digestibility, protein value, and nitrogen absorption specifically associated with corn protein do not present a safety or nutritional concern with regard to the proposed uses.

Table 2. Essential Amino Acid Scores of Animal- and Plant-Based Protein Sources in Adults[1]

	Plant-Based Proteins						Animal-Based Proteins			
	Wheat	**Maize**	**Soybean**	**Pea**	**Faba Bean**	**Lentil**	**Whey**	**Casein**	**Milk**	**Beef**
	Essential Amino Acid Scores (%)[2]									
Histidine	140	187	173	167	231	176	127	180	180	240
Isoleucine	137	127	157	153	112	154	213	167	170	167
Leucine	115	219	136	125	121	132	168	151	161	144
Lysine	31	62	147	182	158	160	204	169	153	207
Methionine + Cysteine	120	127	91	73	79	91	130	125	134	157
Phenylalanine + Tyrosine	290	300	277	267	247	263	227	343	313	280
Threonine	109	161	174	191	156	165	291	187	174	209
Valine	108	128	126	131	95	135	162	162	159	133

[1] Excerpted from Berrazaga *et al.* (2019)

[2] Scores are calculated based on recommended amino acid scoring pattern for adults (WHO/FAO/UNU, 2007)

Table 3. Essential Amino Acid Scores of Animal- and Plant-Based Protein Sources in Young Children[1]

	Plant-Based Proteins						Animal-Based Proteins			
	Wheat	**Maize**	**Soybean**	**Pea**	**Faba Bean**	**Lentil**	**Whey**	**Casein**	**Milk**	**Beef**
	Essential Amino Acid Scores (%)[2]									
Histidine	112	150	138	134	185	141	102	144	144	192
Isoleucine	128	119	147	143	105	144	200	157	159	157
Leucine	106	202	126	116	112	122	155	140	149	133
Lysine	26	52	124	153	133	135	172	142	129	174
Methionine + Cysteine	102	108	78	62	67	78	111	106	114	134
Phenylalanine + Tyrosine	229	237	218	211	195	207	179	270	247	221
Threonine	88	130	140	154	126	133	235	151	140	169
Valine	100	119	117	122	88	126	151	151	148	124

[1] Adapted from Berrazaga *et al.* (2019)

[2] Scores are calculated based on recommended amino acid scoring pattern for children 6 months to 3 years of age (FAO, 1991)

3. Although your notification provides a limited discussion of corn protein allergy and the identification of a lipid transfer protein which may be the primary maize allergen (page 31), you do not discuss whether or not the allergic potential for your article of commerce is significantly changed from other corn products currently on the market. Based on your intended use, it appears that there will be a large increase in dietary exposure to potential corn allergens. Please discuss whether this is the case and if so, address the safety of a large increase in dietary exposure to partially purified/concentrated corn allergens.[1,2]

Response:

The allergenic potential of corn protein in finished food products for human consumption is not expected to be greater compared to other corn products currently on the market. As discussed in the corn protein GRAS Notice, food allergy to maize is rarely noted and the primary maize allergen responsible for food-induced allergic reactions is a nonspecific lipid transfer protein (LTP), which is considered a pathogenesis-related protein that may be induced by plant stress (Goodman *et al*., 2013; Pastorello *et al*., 2000; Pastorello *et al*., 2009). Maize LTP is reported to be produced and stored in the pericarp of the grain as well as throughout the embryo (germ) of the mature grain (Goodman *et al*., 2013). Because the raw material used to produce corn protein is de-germed corn gluten meal (*i.e.*, derived from the corn endosperm, which is depleted of hull and endosperm fiber components, with the protein comprising mainly of zein and glutelin), the finished corn protein ingredient lacks the lipid-rich fraction and is not expected to have concentrated levels of LTP. Pastorello *et al.* (2003) report that thermostable LTP is extractable in the water-soluble fraction as well as in total protein and glutelin fractions, but LTP was not identified in the total zein fraction by IgE immunoblotting.

In vitro evidence suggests that immune response to maize prolamins (zeins) identified as alpha-zeins may occur in some patients with celiac disease (Cabrera-Chavez *et al*., 2012); however, the clinical significance of this finding has not been determined. Similarly, immunoblot analysis of plasma from young pigs fed a blended maize/soybean meal diet for nine days after weaning revealed an elevated immune response against the 27 kDA maize protein (γ-zein) (Krishnan *et al*., 2010), but this isolated report is considered to have limited relevance to the safety evaluation of Cargill's corn protein ingredient. Further, there were no reports identified in the literature regarding allergenicity of corn gluten meal (corn protein raw material) when used as an animal feed ingredient.

Based on the information reviewed above, Cargill does not anticipate potential corn allergens to become purified or concentrated in the corn protein ingredient. The potential for corn protein to elicit an allergic response is expected to be similar to, or perhaps lower than, that associated with normal consumption of corn. As stated in the corn protein GRAS Notice, formulated finished food product ingredient lists would state the presence of a corn protein ingredient and individuals who wish to

[1]Hari B. Krishnan, Monty S. Kerley, Gary L. Allee, Sungchan Jang, Won-Seok Kim, and Chunjiang J. Fu. Maize 27 kDa γ-Zein Is a Potential Allergen for Early Weaned Pigs. J. Agric. Food Chem. 2010, 58, 7323–7328.

[2]Cabrera-Chávez & Stefania Iametti & Matteo Miriani & Ana M. Calderón de la Barca & Gianfranco Mamone & Francesco Bonomi Maize Prolamins Resistant to Peptic-tryptic Digestion Maintain Immune-recognition by IgA from Some Celiac Disease Patients Francisco Plant Foods Hum Nutr (2012) 67:24–30.

avoid corn protein consumption for any reason would be able to identify the presence of a corn-derived ingredient.

4. Please provide the search terms and databases used for this search. FDA found several published studies not cited in your notice that may be of importance to your safety assessment. Examples include *in vivo* digestibility and nitrogen absorption/protein quality clinical evaluations[3] and studies in pigs[4,5] rats[6] as well as *in vitro* digestibility of corn prolamines and various maize preparations.[7] Please discuss the relevance, or lack thereof, of this information to your safety conclusion.

   Response:

   The literature searches supporting the corn protein GRAS assessment were performed using the National Library of Medicine (NLM) TOXNET sources (*e.g.*, PubMed, TOXLINE) as well as subscription-based literature database access (*i.e.*, ToxPlanet, Timberlake Ventures, Inc.) and included the terms "corn protein", "maize protein", "corn AND protein", "maize AND protein" and "zein". Results were screened to identify publications that were deemed relevant to the safety evaluation and GRAS assessment of corn protein for the proposed uses. Studies on *in vivo* digestibility and nitrogen absorption/protein quality of corn/maize were not considered pivotal to the safety evaluation of Cargill's corn protein ingredient due to the expectation that these parameters will be in similar ranges compared to those reported for maize, whole corn, and corn cereal in humans (*e.g.*, mean protein digestibility values of 85%, 87%, and 70%, respectively) (FAO, 1991). Although the digestibility, protein value, and nitrogen absorption of maize by animals and humans is reportedly lower compared to some other protein sources (FAO, 1992; Sauer *et al.*, 2015; Asche *et al.*, 1989), Cargill's corn protein is only intended to replace a small portion of the total background protein consumption in the human diet (*i.e.*, the conservative per user 90th percentile intake estimate for corn protein is 24.3 g/day compared to the 90th percentile intake of protein from food and beverages ranging from 68.3-139.1 g/day (USDA, 2015)). Therefore, these nutritional quality considerations do not contradict a GRAS conclusion for the proposed uses of corn protein.

   He *et al.* (2018) report that hydrolyzed corn gluten meal may be more bioavailable than crude corn gluten meal, with associated improvements in growth and immunological parameters measured in rats. The findings of this study comparing hydrolyzed corn gluten meal and corn gluten meal, and lacking a concurrent negative control group, are considered to have limited relevance to the safety evaluation and GRAS assessment of corn protein as a human food ingredient.

[3] A variety of possibly relevant studies are cited in Chapter 6. - UN Food and Agriculture Organization publication, Maize in Human Nutrition (1992).

[4] N. Sauer, M. Eklund, S. Hoerner, M. Rademacher, and R. Mosenthin. Comparison of standardized ileal amino acid digestibilities in protein supplements and cereal grains for weaned pigs J. Anim. Sci. 2012.90:107–109

[5] Gary L. Asche, Austin J. Lewis and Ernest R. Peo, Jr Protein Digestion in Weanling Pigs: Effect of Dietary Protein Source. The Journal of nutrition 119 Pages: 1093-9, 1989

[6] Yuan-Qing He, Chao-Yue MA, Ye Pan, Li-Jing Yin , Jie Zhou , Yuqing Duan, Haihui Zhang and Haile MA. Bioavailability of Corn Gluten Meal Hydrolysates and Their Effects on the Immune System Czech J. Food Sci., 36, 2018 (1): 1–7

[7] Alexandra Nunes, Isabel Correia, Antoä Nio Barros, And Ivonne Delgadillo J. Sequential *In Vitro* Pepsin Digestion of Uncooked and Cooked Sorghum and Maize Samples Agric. Food Chem. 2004, 52, 2052-2058

Based on the availability of *in vivo* digestibility data on corn/maize and corn gluten meal in animals and humans, *in vitro* digestibility data (*e.g.*, Nunes *et al.*, 2004) were not analyzed as part of the current assessment.

In consideration of the relevant literature on corn/maize and its proteins, as well as the corn gluten meal raw material, there are no safety concerns regarding the proposed uses of corn protein as a human food ingredient, which is expected to replace only a small portion of the background intake of protein.

5. Your notification states the data and information contained within certain GRAS notifications for other plant protein isolates and concentrates (*i.e.*, GRN 684, GRN 683, GRN 581, GRN 447) to be supportive of the current GRAS conclusion for corn protein. However, prior GRNs that you cite each identify antinutrients (such as phytate, lectins, protease inhibitors, polyphenols, *etc*.) specific to the plant source material and provide data and information to support the safety and suitability of the final ingredient for the intended uses. Please describe any antinutrients (*e.g*., phytate) present in your ingredient and discuss whether their presence impacts safety and suitability of the ingredient for its intended uses.

   Response:

   Mean phytate values for the raw material, corn gluten meal, were analyzed to be 0.62% on a dry weight basis. There is no reason to believe that subsequent ethanol extraction and desolventizing would affect these phytate levels. Hence, phytate levels in corn protein are expected to be similar. This value is within the range of phytic acid levels reported for other protein isolates, including canola protein, which ranged from <0.14% to 3.34% (GRN 683). Further, GRN 683 includes the following discussion of phytic acid consumption in the human diet which is considered relevant to the safety evaluation of corn protein:

   "Phytic acid is ingested with many plant-derived foods. Soy protein isolate is reported to contain 1.6-2.0 % phytic acid (Honig, Wolf & Rackis 1984). Lower values (0.49-0.84 %) were reported more recently (Hurrell et al. 1992). In tofu, 1.46-2.90 % phytic acid was found (on a dry matter basis). Phytic acid/ phytate is present in cereals such as maize 0.72-2.22 %, wheat 0.39-1.35 %, rice 0.06-1.08%, barley 0.38-1.16%, sorghum 0.57-3.35 %, oat 0.42-1.16%, rye 0.54-1.46 %, millet 0.18-1.67 %, triticale 0.50-1.89 % and wild rice 2.20% (on dry matter basis). The level of phytic acid/phytate has also been identified in several legumes such as kidney beans 0.61-2.3 %, broad beans 0.51-1.77 %, peas 0.22-1.22 % dry cowpeas 0.37-2.90 %, chickpeas 0.28-1.60 % and lentils 0.27-1.51 % (on dry matter basis). Several type of nuts contain Phytic acid/phytate ranging from 0.17-9.42 % (on dry matter basis) (Schlemmer, Frølich, Prieto & Grasesn 2009). [GRN 683]*"*

   Therefore, Cargill concludes that the phytate levels in corn protein are consistent with those safely consumed as part of the normal human diet.

6. Your notification states that your ingredient is >65% protein and discusses the "nutritional and safety considerations for protein intake" and provides a safety evaluation of several identified potential protein impurities and contaminants. Please address the safety of the up to 35% of your ingredient which is not protein.

Response:

The non-protein fraction of corn protein is composed of carbohydrates, fat/oil, ash, organic acid, and water, which are common constituents of the human diet. Table 5 in the corn protein GRAS Notice presents the compositional analysis for representative batches of corn protein with a protein content of 65% (*e.g.*, CPC-P-040416-147-2B, CPC-P-040416-147-3B, CPC-P-041116-148-3A). Per Table 5 of the GRAS Notice, there is 23-28% carbohydrates, primarily composed of starch (17-23% dwb) and fiber (2-4%), as well as fat/oil, organic acids, and ash. In addition, per the specifications, there could be up to 12% loss on drying yielding even lower amounts of these constituents. Therefore, Cargill concludes that the constituents comprising up to 35% of the corn protein ingredient (carbohydrates, fat, ash, organic acids, and water) do not present a safety concern.

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