August 24, 2023

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

Re: Generally Recognized as Safe (GRAS) Notification for Lemna Leaf Protein

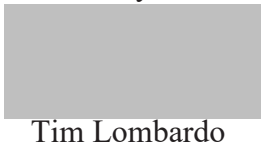
Dear Sir/Madam:

In accordance with regulation 21 CFR §170 Subpart E consisting of §170.203 through 170.285, Plantible Foods hereby submits the enclosed notice to the United States Food and Drug Administration that Lemna Leaf Protein, produced in accordance with FDA Good Manufacturing Practices requirements, is considered to be Generally Recognized As Safe (GRAS) when consumed as a nutritional ingredient in commercial food products at a maximum inclusion level of 20%.

Pursuant to the regulatory and scientific procedures established by the regulation at 21 C.F.R.§ 170, the intended uses of Plantible Foods' Lemna Leaf Protein are exempt from premarket approval requirements of the United States Federal Food, Drug and Cosmetic Act, because the notifier has determined that such use is GRAS.

Should you have any questions regarding this GRAS Notice or require additional information to aid in the review, please do not hesitate to contact us via email at tlombardo@easconsulting.com.

Sincerely,



Tim Lombardo
Sr. Director Food Consulting Services
EAS Consulting Group, LLC

EVALUATION OF THE GENERALLY RECOGNIZED AS SAFE (GRAS) STATUS OF LEMNA LEAF PROTEIN AS A FOOD INGREDIENT

Prepared for:
Plantible Foods
2600 Sarver Lane
San Marcos, CA 92069

August 2023

EVALUATION OF THE GENERALLY RECOGNIZED AS SAFE (GRAS) STATUS OF LEMNA LEAF PROTEIN AS A FOOD INGREDIENT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY OF ABBREVIATIONS

CFU	Colony Forming Units
cGMP	current Good Manufacturing Practices
dw/DW	dry weight
EDI	Estimated Daily Intake
fw/FW	fresh weight
FDA	United States Food and Drug Administration
FSANZ	Food Standards Australia New Zealand
FSIS	Food Safety and Inspection Service
GRAS	Generally Recognized As Safe
GRN	GRAS Notice Filing Number
HACCP	Hazard Analysis Critical Control Point
HOC	Hippocampal Occupancy Score
IHF	Intrahepatic Fat
ILA	International Lemna Association
ISCDRA	International Steering Committee on Duckweed Research and Applications
LVV	Lateral Ventricle Volume
LLP	Lemna Leaf Protein
LPC	Lemna Protein Concentrate
MED	Mediterranean
NAFLD	Non-Alcoholic Fatty Liver Disorder
NLT	Not Less Than
NMT	Not More Than
NOAEL	No Observed Adverse Effect Level
OECD	Organisation for Economic Co-operation and Development

PDCAAS	Protein Digestibility Corrected Amino Acid Score
ppb	parts per billion
ppm	parts per million
UN FAO	United Nations Food and Agriculture Organization
USDA	United Stated Department of Agriculture
WHLPC	Water Hyacinth Leaf Protein Concentrate

EVALUATION OF THE GENERALLY RECOGNIZED AS SAFE (GRAS) STATUS OF LEMNA LEAF PROTEIN AS A FOOD INGREDIENT

1. PART I. SIGNED STATEMENT AND CERTIFICATION

1.1. Basis of Conclusion

This GRAS conclusion for the use of Lemna Leaf Protein (LLP) in selected food categories has been reached in accordance with the requirements in 21 CFR 170.220.

1.2. Name and Address of Organization

Plantible Foods
2600 Sarver Lane
San Marcos, CA 92069

1.3. Name of Substance

The name of the substance of this GRAS assessment is Lemna Leaf Protein (LLP) derived from the leaf of the plant *Lemna minor*. It is also known as duckweed, common duckweed, lesser duckweed, least duckweed, water lentils, and Water Lentil Protein concentrate.

1.4. Intended Conditions of Use of Lemna Leaf Protein Concentrate

Plantible Foods (Plantible), intends to use a standardized LLP as a food ingredient in human food products and component of the human diet as a protein source. Plantible's standardized LLP is intended for use as a food ingredient at levels consistent with current Good Manufacturing Practices (cGMPs) conditions of use in a variety of food categories that include beverages and beverage bases, breakfast cereals, frozen dairy desserts and mixes, grain products and pastas, milk products, plant protein products, processed fruits and fruit juices, snack foods, soft candy, soups and soup mixes, and salad dressings. Levels of use and exposure are discussed in detail in Part III. It is recognized that there are Standard of Identity requirements for some of these specified foods and these foods will not be referred to by their commonly recognized names.

1.5. Statutory Basis for GRAS Conclusion

This GRAS conclusion for LLP is based on scientific procedures in accordance with 21 CFR 170.30(a) and 170.30(b).

1.6. Exemption from Premarket Approval Requirements

Plantible has concluded that the use of LLP is not subject to the premarket approval requirements of the Federal Food, Drug, and Cosmetic Act based on Plantible's conclusion that LLP, meeting the specifications cited herein, and when used as a food ingredient, is GRAS, and is therefore exempt from the premarket approval requirements.

This GRAS determination is based on data generally available in the public domain pertaining to the safety of Lemna Leaf Protein, as discussed herein, and on consensus among a panel of experts who are qualified by scientific training and experience to evaluate the safety of the Lemna Leaf Protein as a food ingredient [see Appendix 7, entitled "Expert Panel Consensus Statement Concerning the Generally Recognized as Safe (GRAS) Status of Lemna Leaf Protein (LLP) for Use as a Food Ingredient"].

It is also Plantible's opinion that other qualified and competent scientists reviewing the same publicly available toxicological and safety information would reach the same conclusion. Therefore, Plantible has also concluded that LLP, when used as described in this dossier, is GRAS based on scientific procedures.

1.7. Availability of Data and Information

The data and information that are the basis for this GRAS conclusion will be made available to the FDA by contacting Tony Martens at the below address. The data and information will be made available to the FDA in a form in accordance with that requested under 21 CFR 170.225(c)(7)(ii)(A) or 21 CFR 170.225(c)(7)(ii)(B).

Tony Martens
Plantible Foods
2600 Sarver Lane
San Marcos, CA 92069
tony@plantiblefoods.com

OR

Tim Lombardo
EAS Consulting Group, LLC
1700 Diagonal Road, suite 750
Alexandria, VA 22314
tlombardo@easconsultinggroup.com

1.8. Data Exempt from Disclosure

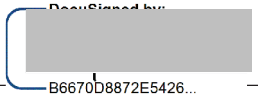
Parts II through VII of this GRAS assessment do not contain any data or information that is exempt from disclosure under the Freedom of Information Act. There is no privileged or confidential information such as trade secrets and/or commercial or financial information in this document and the information contained in this dossier can be made publicly available.

1.9. Certification

Plantible certifies that, to the best of its knowledge, this GRAS conclusion is based on a complete, representative, and balanced dossier that includes all relevant information, available and obtainable by Plantible, including any favorable or unfavorable information, and pertinent to the evaluation of the safety and GRAS status of the use of LLP. Plantible accepts responsibility for the GRAS conclusion that has been made for LLP as described in this GRAS dossier.

1.10. Name, Position/title of Responsible Person who Signs Dossier and Signature

Tony Martens
Co-Founder
Plantible Foods
2600 Sarver Lane
San Marcos, CA 92069
tony@plantiblefoods.com

Signature: 

1.11. FSIS/USDA – Use in Meat and/or Poultry

Plantible does not intend to add LLP to any meat and/or poultry products that come under USDA jurisdiction at this time. Therefore, 21 CFR 170.270 does not apply.

2. PART II. IDENTITY AND TECHNICAL INFORMATION

2.1. Overview of Approach to GRAS Determination of LLP

Plantible has determined LLP to be GRAS through scientific principles, based on the weight of evidence including compositional analysis of LLP and publicly available toxicology data on similar duckweed protein products like Parabel's LENTEIN™ Complete described in GRN 742. FDA issued a "No Objections" letter to GRN 742 on August 22, 2018. Plantible prepared a body of analytical data to characterize LLP relative to LENTEIN™ Complete, and draws upon publicly available information about the composition, nutritional value and safety of LENTEIN™ Complete and other closely related plants and protein products in the following assessment.

2.2. Description and Background on Duckweeds

Duckweeds are floating aquatic plants with the scientific name Lemnaceae, which are monocots (like grasses and palms) and are divided into five genera*: Lemna, Spirodela, Wolffian, Landoltia, and Wolffiella*.

Duckweeds represent a small family of aquatic floating monocots consisting of 37 species distributed all over the world (Landolt, 1986; Sree et al., 2016). These plants are the fastest growing angiosperms (Sree et al., 2015; Ziegler et al., 2015) and may cover ponds or lakes within a few days under favorable growth conditions. Nine duckweed species occur in North America. Common duckweed (*L. minor*) is the most widespread species, ranging across Canada and reported for all states except Hawaii and South Carolina. (Fertig, W, undated).

Duckweed was first described by C. von Linne in 1753 (Sree et al., 2016). Duckweeds have been consumed as human food in several Asian countries with local names of khai nam, kai-pum, or kai nhae, and *Wolffia globosa* is sold in vegetable markets in different regions of Thailand (Appenroth et al., 2018). The European Food Safety Authority (EFSA) recently recognized fresh plants of *Wolffia arrhiza* and *Wolffia globosa* as a "traditional food from a third country" and confirmed that cultivation under vertical farming conditions does not raise safety concerns (EFSA, 2021a). Duckweed has a long history of use as an animal feed and has more recently been investigated as a protein source for humans (Zeinstra et al., 2019). Recently, Parabel Ltd completed a GRAS assessment of LENTEIN™ Complete, a water lentil (whole Lemnaceae) protein powder (GRN 742), which will be used as a point of reference throughout this GRAS assessment of Lemna Leaf Protein (LLP).

An excellent review on duckweeds (Lemnaceae) which includes discussions on identity, background, uses, etc. can be found at https://www2.palomar.edu/users/warmstrong/1wayindx.htm#Tech. This review contains a large volume of information and is not attached to this document. Instead, the reader is directed to the URL above.

Other publications that speak to the utility of duckweed are:

"FACTSHEET: DUCKWEED AS BIOMASS" [Available at: https://www.usda.gov/sites/default/files/documents/Duckweed_Factsheet.pdf].

"Practical duckweed: Application Areas and Sponsors" [Available at: https://www.pinterest.com/pin/71213237830788532/].
"DUCKWEED: A tiny aquatic plant with enormous potential for agriculture and environment" [available at: http://hdl.handle.net/2346/73062].

"Health Benefits of Duckweed for Humans" [available at: https://healthyfocus.org/health-benefits-of-duckweed-for-humans/], where duckweed is described as follows:

> "Duckweed contains all nine of the essential amino acids giving it a protein profile similar to eggs. This makes the plant a potential source of high-quality protein for vegans and in areas of the world where nutritional support is needed. Duckweed is also a great source of nutrients including many minerals and vitamins. minerals. Duckweed is a good source of vitamin A and the B-complex vitamins and is a unique plant source of vitamin B12. The plant is a good source of dietary fiber and contains minerals like zinc and iron. In addition, duckweed contains abundant antioxidants including polyphenols, and flavonoids like catechins." This reference was included to demonstrate that the utility of duckweed as a food source is generally recognized; its inclusion in this document is not intended to imply any health claims.

Duckweed is described in the Rutgers Lam Lab website (http://rutgerslamlab.weebly.com/duckweed-research.html) as follows:

> ***"What is Duckweed?***
> Duckweed is a family of flowering aquatic plants that float on the surface of ponds, lakes and other slow-moving bodies of water. Five genera of duckweed have been identified, … The *Wolffia* genus contains the smallest known flowering plants on earth. As its name implies, duckweed is eaten by ducks—as well as other animals—and behaves much like a weed: it can grow rapidly on nutrient-rich water, covering ponds in thick green mats."
>
> Also on the website,
>
> ***"Finding the Right Duckweed for the Job***
> There are 37 species of duckweed distributed worldwide, from Siberia to the tropics. Many species grow in multiple locations, forming genetically distinct populations, called strains or clones. The largest collection of duckweed strains—with over 900 accessions …—is housed at the Rutgers Duckweed Stock Cooperative. Researchers in the Lam lab exploit the large genetic diversity of duckweed by systematically comparing strains in the collection; we measure metabolite levels and growth characteristics under a range of environmental conditions. The aim is to find a strain that is well suited for a particular application and environment. For example, strains with a high protein content are ideal for animal feed, whereas strains with a high starch content, the precursor for ethanol, are desirable for biofuels. Ultimately, promising candidates will be tested in the field to determine if large-scale production is technically and economically feasible."

2.3. Botanical Characteristics and Taxonomic Classification of Duckweed

Duckweed (*Lemna* L.; family Lemnaceae) is a small, free-floating aquatic plant that forms mats on or beneath the surface of water. The plant body comprises round or oval leaves of 3mm to 5mm in length from which one root fibril extends down into the water. The unisexual flowers occur in threes on the edge of the stems. They are greenish in color, rounded, slightly compressed and very delicate. The seed vessel yields a seed which is ribbed lengthways. The numerous dagger-like raphides (needle-like crystals occurring in plant cells), which are present in the leaves, protect the plant from slug damage. The plant is a favorite food with ducks and geese. Duckweed reproduces readily in ponds and pools, covering the surface completely. In doing so, it prevents the water from stagnating. Duckweed flowers from April to May.

The Lemnaceae family comprises ~37 species, including gibbous duckweed (*Lemna gibba* L.), lesser duckweed (*Lemna minor* L.), star duckweed (*Lemna trisulca* L.), turion duckweed (*Lemna turionifera* Landolt), and least duckweed (*Lemna minuta* Kunth) (Sree et al., 2016). They are found in all areas except waterless deserts and those permanently frozen areas. They grow best in tropical and temperature zones, even though many species can survive extreme temperatures. Cosmopolitan in range, it grows best in eutrophic (nutrient-rich) waters.

Lemna is the Greek name for a water plant and probably comes from limne, meaning swamp or pond. The Latin word minor means small, tiny. The Latin name for the plant was Lens palustris or Lens aquatica.

The Lemnaceae family includes the subfamilies Wolffioideae and Lemnoideae. *Lemna minor* is a member of the Lemnoideae sub-family comprising three genera, *Lemna*, *Landoltia*, and *Spirodela* (Les et al., 2002). The growth of these high-protein plants can be extremely rapid, doubling in biomass every 24-48 hours. Because of this fast growth, they can be harvested daily. Lemna is one of the best known of this group and has been the subject of much research. There are at least 14 recognized species of Lemna (Les et al., 2002; Sree et al., 2016; US NPGS, 2022). The most common duckweed species include *Lemna minor, Wolffia globosa, Lemna gibba, Spirodela polyrhiza, Lemna obscura,* and *Wolffia arrhiza.*

The taxonomical classification of the source plant for LLP, *Lemna minor,* is provided in Table 1. A picture of the plant is shown in Figure 1. Some have classified it as a member of the Araceae family (Armstrong, 2021 https://www2.palomar.edu/users/warmstrong/1wayindx.htm#Tech). Sree et al. (2016) provides a more recent accounting of the taxonomy of duckweeds and updates to nomenclature, characterization and identification of new species since the Lemnaceae family was comprehensively described in a monograph by E. Landolt in 1986. The authors noted that a number of reports that describe duckweed have identified the duckweed species incorrectly. The authors attempt to clarify the situation by proposing that duckweed should be considered to be a family using the term "Lemnaceae" instead of considering duckweed as a subfamily of Araceae under the term "Lemnoideae". The use of the term "Lemnaceae" seems to be accepted as evidenced by recent publications (ISCDRA, 2020a).

Given these changes, we note that articles published earlier than 2016 may have mis-characterized the duckweed product. In fact, a number of earlier articles sometimes referred to the product only as duckweed with no further classification provided. To the extent that the information in those

articles appears pertinent, it is discussed in this document. However, there may be reports that are not included because of the ambiguity involved in the characterization.

The common accepted name for protein products obtained from *Lemna minor* is "water lentil protein" or "water lentil protein concentrate." Contrary to popular belief, water lentils are not a lentil (or legume). Water lentils are nutrient-rich vegetables similar to watercress or microgreens. They have been traditionally used in diets across Southeast Asia and as an herbal remedy. Recently, water lentils have slowly started to gain popularity across the world as a nutrient dense and high-quality plant-based protein source. Plantible is referring to their product as "Lemna Leaf Protein" as their product is produced exclusively from the leaf of *Lemna minor* and is high in the common plant protein, Rubisco.

Table 1. Hierarchical Classification of *Lemna Minor*

Taxonomic Hierarchy

Kingdom	Plantae – plantes, Planta, Vegetal, plants
Subkingdom	Viridiplantae – green plants
Infrakingdom	Streptophyta – land plants
Superdivision	Embryophyta
Division	Tracheophyta – vascular plants, tracheophytes
Subdivision	Spermatophytina – spermatophytes, seed plants, phanérogames
Class	Magnoliopsida
Superorder	Lilianae – monocots, monocotyledons, monocotylédones
Order	Alismatales
Family	Araceae – Arums
Genus	Lemna L. – duckweed
Species	Lemna minor L. – common duckweed, least duckweed, lesser duckweed

Source:
https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=42590#null

Figure 1. Picture of *Lemna minor*

2.4. Specifications and Identity

Food grade specifications of Lemna Leaf Protein (LLP) concentrate manufactured by Plantible are provided in Table 2. LLP is standardized to not less than 80% protein on an 'as is' basis. The other major components are ash and fiber, and a small amount of fat. Analytical results from five non-consecutive lots of Plantible's LLP (Appendix 1) demonstrate that it is manufactured consistently and meets the standard food grade specifications (Table 3). Plantible will test heavy metals on a periodic schedule even though heavy metals are not expected to be a concern as Plantible will use only potable water in the production of LLP. Plantible has also added a conservative specification for oxalic acid as their production process shows negligible levels of oxalic acid in the finished product. Fat was not measured as part of the five batch analyses but has been shown in other analyses to meet the specification of not more than 0.5% on a dry weight basis (Appendix 2, data in Table 4).

The specifications for Plantible's LLP are similar to those established by Parabel Ltd. in GRAS Notice 742 in that they are based on meeting a minimum protein concentration and set limit values for heavy metals and microbiological counts. Plantible's LLP is higher in protein i.e., is a more purified protein product, at not less than 80% protein on an 'as is' basis while Parabel's LENTEIN™ Complete is 39-55% protein on a dry matter basis (up to ~50% on an 'as is' basis) with the difference distributed amongst the other proximates of fat, carbohydrate and ash.

Table 2. Food Grade Specification of Plantible's LLP

Parameter	Specification*	Unit	Method
Description	White, odorless powder	-	Visual inspection
Proximate			
Moisture	≤10	%	AOAC
Protein	≥80	%	AOAC
Ash	≤4.5	%	AOAC
Dietary Fiber	≤15	%	AOAC 991.43
Total Fat	≤0.5	%	AOAC
Oxalic acid	≤0.1	%	HPLC
Heavy Metals			
Lead	<0.1	mg/kg (ppm**)	ICP-MS/ FDA EAM 4.7
Arsenic	<0.4	mg/kg (ppm)	ICP-MS/ FDA EAM 4.7
Cadmium	<0.05	mg/kg (ppm)	ICP-MS/ FDA EAM 4.7
Mercury	<0.05	mg/kg (ppm)	ICP-MS/ FDA EAM 4.7
Microbial			
Aerobic plate count	<15,000	CFU**/g	CMMEF 5th Edition
Yeast	<100	CFU/g	CMMEF 5th Edition
Mold	<100	CFU/g	CMMEF 5th Edition
Coliform	<10	CFU/g	AOAC 991.14
Escherichia coli	<10	CFU/g	AOAC 991.14
Salmonella species	Absent/25g		AOAC 2011.03
Listeria monocytogenes	Absent/25 g		AOAC 2004.02

*all specifications on an 'as is' basis
**Abbreviations: CFU = colony forming units; ppm = parts per million

Table 3. Results of 5-batch Analysis of Plantible's LLP

Parameter	Specification*	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
Lot/Batch#		P022822C1	P031522C1	P011022C1	P030122C1	P012222C1
Proximate						
Moisture	NMT 10%	Moisture 8.03%	Moisture 7.16%	Moisture 7.01%	Moisture 8.92%	Moisture 7.31%
Protein	NLT 80%	81.56% (88.68% on dw basis)	82.56% (88.93% on dw basis)	82.53% (88.75% on dw basis)	80.85% (88.77% on dw basis)	81.74% (88.19% on dw basis)
Ash	NMT 4.5 %	2.99%	3.21%	3.28%	3.22%	3.04%
Carbohydrates						
Dietary Fiber	NMT 15%	10.0%	8.6%	7.5%	9.5%	9.7%
Total Fat	NMT 0.5%	-	-	-	-	-
Oxalic acid	NMT 0.1%	0.019%	0.018%	0.016%	0.013%	0.018%
Heavy Metals						
Lead	<0.1 ppm	58.6 ppb	48.5 ppb	51.6 ppb	53.8 ppb	62.0 ppb
Arsenic	<0.4 ppm	212 ppb	206 ppb	213 ppb	199 ppb	201 ppb
Cadmium	<0.05 ppm	24.3 ppb	23.3 ppb	20.3 ppb	32.6 ppb	21.7 ppb
Mercury	<0.05 ppm	35.0 ppb	35.4 ppb	36.8 ppb	28.7 ppb	38.6 ppb
Microbial						
Aerobic plate count	<15,000 CFU/g	840 CFU/g	90 CFU/g	150 CFU/g	22,000 CFU/g	370 CFU/g
Yeast	<100 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g
Mold	<100 CFU/g	20 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	60 CFU/g
Coliform	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g
Escherichia coli	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g	<10 CFU/g
Salmonella species	Absent/25g	Absent/25g	Absent/25g	Absent/25g	Absent/25g	Absent/25g
Listeria monocytogenes	Absent/25 g	Absent/25g	Absent/25g	Absent/25g	Absent/25g	Absent/25g

Abbreviations: CFU = colony forming units; ppm = parts per million; ppb = parts per billion; NLT = not less than; NMT = Not more than; dw = dry weight
*all specifications on an 'as is' basis

A representative compositional and nutritional analysis of Plantible's LLP is provided in Table 4 (Source Certificate of Analysis found in Appendix 2).

Table 4. Representative Compositional and Nutritional Analysis of LLP

Parameters	Amount*
Protein (g/100g)	80.2
Total carbohydrates (g/100g) by difference	10.62
Total fat (g/100g)	0.35
Total dietary fiber (g/100g)	12.5
Ash (g/100g)	4.2
Moisture (g/100g)	4.7

Parameters	Amount*
Calcium (mg/100g)	60.6
Manganese (ppm)	12.4
Iron (mg/100g)	50.9
Phosphorus (mg/100g)	566
Potassium (mg/100g)	1640
Sodium (mg/100g)	285
Vitamin B12 (micrograms/100g)	16.76
Total calories (cal/100 g)	366.23

*Based on information provided by Plantible (2022), see Appendix 2. Values are on a fresh weight, 'as is' basis.

Of note is the significantly lower level of manganese in Plantible's LLP compared to LENTEIN™ Complete (12.4 vs. 245 ppm). Additional analysis of manganese showed that the average level is 11.4 ppm (Appendix 2).

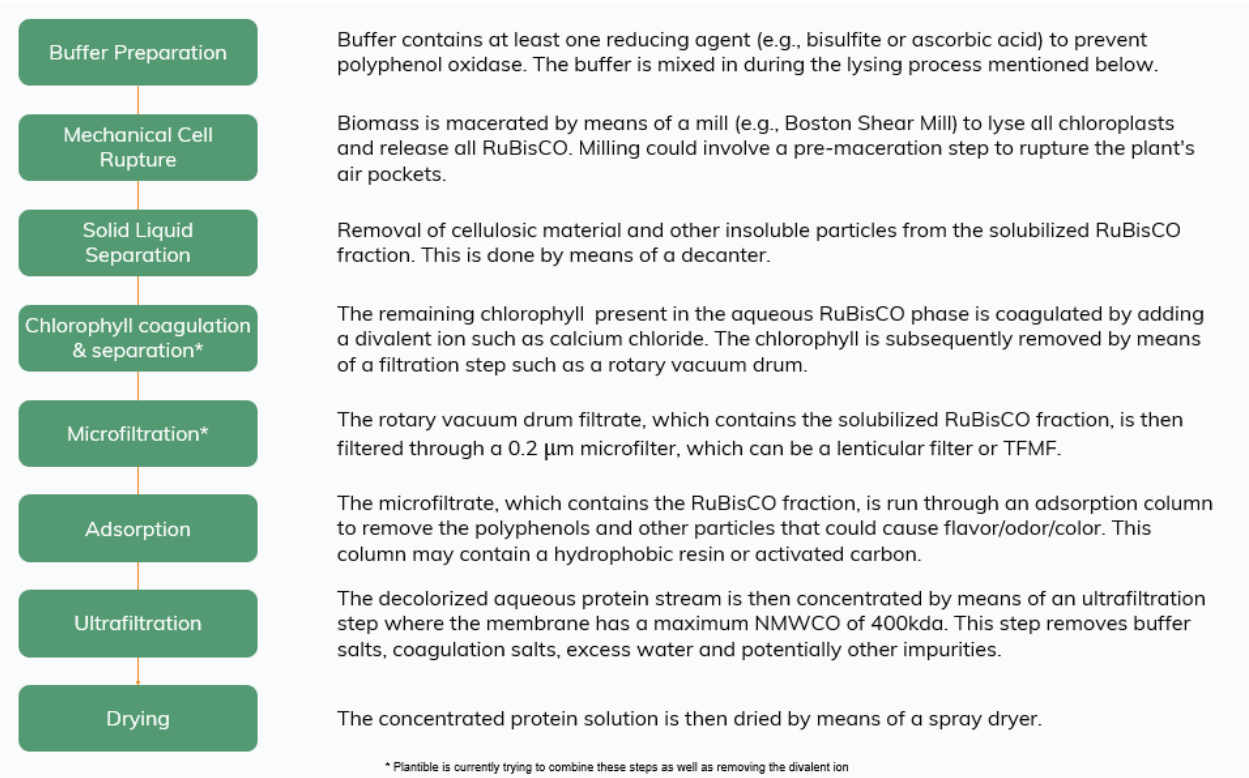
2.5. Manufacturing Process

Plantible's LLP is produced under controlled conditions in large self-contained tanks/raceway ponds in enclosed greenhouses. The ponds are filled with potable water and a stock solution of *Lemna minor* plants is added followed by addition of the appropriate nutrients necessary to obtain optimum growth. A slight circulation is maintained throughout the system to distribute the nutrients throughout. The nutrients are monitored on a regular time schedule and are replenished as necessary to maintain optimum conditions. The water supply is continually monitored for contaminating components including pathogens and heavy metals. Plants grow vegetatively in ponds and are harvested every 2 to 3 days. At time of harvest, ~40-50% of plants are harvested so that the surface of the water remains covered. On average, the plants are 10-15 days old at time of harvest.

The basic principles used in the processing to produce LLP are typical of those familiar with the art of protein extractions. Typically, the *Lemna minor* leaves are harvested, macerated to yield a green juice, followed by separation of the green fraction, followed by purification and concentration of the white fraction to yield Plantible's LLP. As part of the purification process, a covalent cation (e.g., calcium chloride) is used to coagulate the chlorophyll.

The LLP product is manufactured consistent with current Good Manufacturing Practices (cGMPs) and Risk-based Preventive Controls. The manufacturing process is schematically presented in Figure 2. All additives used in the production of LLP are determined to be food grade and safe for use in food production. All equipment and materials used in the production process have a history of use in food processing.

Figure 2. Process for Extraction and Purification of Lemna Leaf Protein from *Lemna minor*



2.6. Stability Data for Plantible's LLP

An accelerated shelf-life study has been conducted for the LLP in collaboration with Certified Laboratories Inc utilizing their proprietary Standard Operating Procedure. The studies were conducted using 2.5 kilograms of LLP, produced in February 2021. The accelerated samples were stored in an incubator (Fischer Scientific, FFU20F9GW3) at 42 °C (which maintains a range of 41-43 °C). There were six points in the accelerated study, including Day 0, and two replicates.

Chemical analysis of moisture content as well as visual and organoleptic evaluations were performed at various time points throughout the 7 months of storage for the accelerated modeling which is equivalent to 28 months of real-time storage at room temperature. Protein and pH were determined at the beginning and end of the study only. Visual and organoleptic evaluations along with water activity and moisture were performed at every time point. The sensory evaluation focused on any changes to visual, textural, or packaging abnormalities, discoloration, or odors of decomposition. Visual and organoleptic evaluations performed on this product did not note any visual, packaging, or textural abnormalities, no discoloration, clumping, or odors were observed for any replicate analyzed through the conclusion of the study at the Month 7 time point. The moisture content of the product fluctuated modestly during the course of the study.

Results are shown in Table 5. An initial average moisture content of 3.25% decreased to 2.48% at the Month 2 time point. The moisture content reached a high point of 4.12% at Month 5 and eventually ended at 3.07% at the conclusion of the study. It should be noted that no clumping, caking or other functional textural or sensory changes were observed in association with these changes in moisture content.

Water activity levels fluctuated as well, as would be expected given the changes in moisture level. The maximum water activity observed (0.346) is still well below the minimum level required to support microbial growth. Protein levels remained stable from the beginning to the end of the shelf-life as evidenced by the relatively small difference in initial (84.2%) to end (85.0%), which is within the measurement of uncertainty for the analysis.

Based on the data set generated in this study and the interpretations provided above, the protein powder product was observed to have a shelf-life of 7 months under accelerated modeling and therefore 28 months if held at room temperature (20-25°C).

Table 5. Organoleptic, Physical and Chemical Evaluation of LLP during a 7-Month Accelerated Shelf-Life Study

Organoleptic Evaluation **Method: CL** SOP F0203

	Odor	**Color**	**Taste**	**Texture**	**Visual**	**Appearance**
Month 0	Normal	Normal	N/A	Normal	Normal	Normal
Month 2	Normal	Normal	N/A	Normal	Normal	Normal
Month 4	Normal	Normal	N/A	Normal	Normal	Normal
Month 5	Normal	Normal	N/A	Normal	Normal	Normal
Month 6	Normal	Normal	N/A	Normal	Normal	Normal
Month 7	Normal	Normal	N/A	Normal	Normal	Normal

Chemical Evaluation **Method:** AOAC

	Total protein		**Moisture Level**		**pH**		**Water Activity**	
	Rep* 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2
Month 0	84.13 %	84.27 %	3.22 %	3.29 %	6.36	6.35	0.154	0.148
Month 2	-	-	2.49 %	2.47 %	-	-	0.194	0.191
Month 4	-	-	2.54 %	2.52 %	-	-	0.197	0.205
Month 5	-	-	4.10 %	4.15 %	-	-	0.295	0.285
Month 6	-	-	3.32 %	3.04 %	-	-	0.344	0.348
Month 7	85.30 %	84.77 %	3.11 %	3.04 %	-	-	0.198	0.189

*Rep = Replicate

2.7. Nutritional Composition

The subject of this GRAS assessment, Lemna Leaf Protein (LLP), is a standardized product produced by the further processing of *Lemna minor*. As previously discussed, *Lemna minor* is an aquatic freshwater plant of the genus, *Lemna*. Commonly known as duckweed or water lentil,

Lemna is also a rapidly growing aquatic plant with high protein content. Traditionally, it has been eaten by humans and used as an animal feedstuff in many parts of the world. Commercially, it is cultivated in large growth systems, harvested, dried and further processed to ensure a consistent product.

Plantible's Lemna protein product is a highly purified protein product containing a minimum of 80% protein, of which 60% is Rubisco protein as confirmed through SDS PAGE analysis. Rubisco is an enzyme, ribulose-1,5-bisphosphate carboxylase/oxygenase (CAS Reg. No. 9027-23-0; EC 4.1.1.39), is present in all leafy plants and is responsible for the first step in photosynthesis, the incorporation of atmospheric CO_2 (Calvin cycle). Given its fundamental role and ubiquitous nature, Rubisco is thought to be the most abundant protein on earth. Additional consideration will be given to the function and history of its safe use in Section 6.

Rubisco is highly water-soluble, therefore, virtually all of the Rubisco protein is extracted into the finished product. As discussed in Section 2.3 above, other plant proteins that are not soluble in water are removed from the finished product through filtration, etc., thus resulting in a higher concentration of Rubisco in the finished product than was present in the original plant leaf.

Proteins are sources of amino acids, which can be divided into essential (also known as indispensable), semi-essential (conditionally indispensable), and non-essential (dispensable) amino acids (Levesque and Ball, 2017). Essential amino acids are those that cannot be synthetized by the organism itself but need to be supplied with the diet in adequate amounts and ratio to each other for building up the body's own proteins (Sundrum et al., 2005). In human nutrition, there are nine essential amino acids: histidine (HIS), isoleucine (ILE), leucine (LEU), lysine (LYS), methionine (MET), phenylalanine (PHE), threonine (THR), tryptophan (TRP) and valine (VAL) (IOM, 2005). In swine nutrition, the same nine amino acids are essential for maintenance and growth (Boisen, 1997). The same nine amino acids together with arginine (ARG) are essential in poultry feeding (Blair, 2008). Furthermore, cysteine (CYS) and tyrosine (TYR) are semi-essential amino acids for pigs and poultry since they can only be synthesized from methionine and phenylalanine, respectively (Sundrum et al., 2005). The deficit of any essential amino acid in the animal diets results in a general protein deficiency (Blair, 2008) and therefore, the adequate supply of essential amino acids is crucial in the nutrition of monogastric animals (Santamaría-Fernández and Lübeck 2020).

Lemna minor contains all the essential amino acids and is as compositionally good or better compared to LENTEIN™ Complete on a % of total protein basis (Table 6). The UN FAO has developed scoring patterns which relate the required amount of an essential amino acid to total protein requirements and provide a reference point for the assessment of a protein to provide for essential amino acids. Based on those patterns, LLP is a good source for essential amino acids.

Table 6. Amino Acid Profile of LLP Compared to LENTEIN™ Complete and the FAO Amino Acid Scoring Pattern

Amino Acid	Lemna Leaf Protein (LLP)	Parabel Ltd's LENTEIN™ Complete[a]	FAO Amino Acid Scoring Pattern for Older Children (3-10 y)[b]	FAO Amino Acid Scoring Pattern for Adults[b]
	Essential Amino Acids (mg/g protein)			
Histidine	26.5	20	16	15
Isoleucine	45.0	43	30	30
Leucine	87.3	76	61	59
Lysine	67.5	52	48	45
Methionine	23.3	17	-	-
Methionine + Cysteine ("Sulfur Amino Acids")	40.9	27	23	22
Phenylalanine	57.6	48	-	-
Phenylalanine + Tyrosine ("Aromatic Amino Acids")	114.8	82	41	38
Threonine	48.5	47	24	23
Tryptophan	27.4	21	6.3	6.0
Valine	61.9	54	40	39
	Conditionally Indispensable Amino Acids (mg/g protein)			
Cysteine	17.6	10		
Tyrosine	57.2	34		
Arginine	71.5	53		
Glycine	46.8	49		
Proline	52.4	41		
	Dispensable Amino Acids (mg/g protein)			
Alanine	59.5	54		
Serine	39.6	36		
Aspartic Acid	94.9	84		
Glutamic Acid	115.6	137		

[a]From Table 11 in GRN 742. Reported as percent of total protein, which was converted to mg/g protein by multiplying value by 10.
[b]FAO Food and Nutrition Report #92, 2013. Dietary protein quality evaluation in human nutrition. 35978-02317b979a686a57aa4593304ffc17f06.pdf (fao.org)

A similar analysis of amino acid value was conducted by ABC Kroos BV on their water lentil protein, which is produced from *Lemna minor* and *Lemna gibba*. Table 7 below is reproduced from their report "Water Lentils, Delicious and Healthy!" (https://rubiscofoods.com/waterlinzen-

kookboek/). The table provides an overview of essential amino acids and the proportion in which they occur in some food proteins. This reference was included to illustrate the typical amino acid profile of protein from water lentils and is not intended to make any health claims. Also, the recommended amino acid composition of protein in human nutrition according to the FAO is given. Table 7 shows that water lentils, milk, soy and beef, but not whole grains, are a full source of protein for human nutrition. Notably, water lentil protein scores much better on essential amino acid content than soy and whole grain protein and is of comparable value to the meat and milk animal proteins. The report notes that the content of branched-chain amino acids ("Branched Chain Amino Acids"), required for muscle building, is higher in the water lentils than even milk or beef protein.

Table 7. Essential Amino Acids in Different Foods - Reproduced from "Water Lentils, Delicious and Healthy!"

	Recommended min. content[1] (adults) (mg/g protein)	Water lentils[2] (mg/g protein)	Milk[3] (mg/g protein)	Beef[3] (mg/g protein)	Soy[3] (mg/g protein)	Whole grain[3] (mg/g protein)
Lysine (Lys)	45	80	83	89	60	23
Branched chain amino acids (BCAA) (Val+Leu+Ileu)	128	246	225	182	166	141
Sulfur-containing amino acids	22	37	32	36	24	36
Histidine (His)	15	31	28	44	25	21
Threonine (Thr)	23	57	51	47	40	28

"1) FAO report 92: Dietary protein quality evaluation in human nutrition (2011).
2) Native Lemna minor protein such as process won by ABCKroos BV. Analysis by Nutricontrol Veghel (2014)
3) FAO / WHO / UNU Expert consultation (2013)."
Note: These subscripts quoted from the "Water Lentils, Delicious and Healthy" booklet. The FAO Report #92 was published in 2013 as a result of a consultation held in 2011.

Literature reports confirm that *Lemna minor* grown in culture is a source of essential and non-essential amino acids. Total protein was shown by Chakrabarti et al., (2018) to vary based on production conditions such as source of fertilizer, and in this study was 27-36% of dry weight. The fatty acid composition was dominated by poly-unsaturated fatty acids (PUFA) at 60–63% of total fatty acids. The largest components of PUFA were α-linolenic acid (18:3n-3) at around 41 to 47% and linoleic acid (18:2n-6) at 17–18% (Chakrabarti et al., 2018).

Analysis by other researchers showed similar results. In a report by Appenroth et al. (2018), 11 species of the genus Lemnaceae were investigated for ingredients relevant to human nutrition. The total protein content varied between 20 and 30% of the freeze-dry weight, the starch content between 10 and 20%, the fat content between 1 and 5%, and the fiber content was ~25%. The essential amino acid content was in most cases higher, and in the case of lysine very close to the requirements of preschool-aged children according to standards of the World Health Organization. The fat content was low, but the fraction of polyunsaturated fatty acids was above 60% of total fat

and the content of omega-3 (n-3) polyunsaturated fatty acids was higher than that of omega-6 (n-6) polyunsaturated fatty acids in most species. The content of macro- and microelements (minerals) not only depended on the cultivation conditions but also on the genetic background of the species. This holds true also for the content of tocopherols, several carotenoids and phytosterols in different species.

Data from many studies indicate that the variability of the protein content and composition of Lemna sp. is more related to the nutrient content of the growth media than the species pertaining to the Lemnaceae family (Appenroth et al., 2017, 2018). Landolt and Kandeler (1987) concluded that the protein content of water lentils can be easily controlled by optimizing the cultivation conditions of species, leading to a protein content close to 40%. Many reports support the conclusion that the macro composition is generally influenced more by growth conditions and water chemistry than taxonomic species (Culley et al., 1981; Zaher et al., 1995; Majid et al., 1992; Hillman and Culley, 1978; Shireman, et al., 1977; Culley and Epps, 1973; Hassan and Edwards, 1992; Rusoff et al., 1980). Also, the amino acid profile is similar for all members of the Lemnaceae. This means that regardless of the species blend (and therefore geographic location), the amino acid composition is nearly the same. In a report by Rusoff et al. (1980), the amino acid composition of four species “showed very little variation”. A similar finding was echoed in Porath, et al., (1979) stating that the "variation [of four species of water lentils] in amino acid composition was only negligible".

The Protein Digestibility Corrected Amino Acid Score (PDCAAS) was estimated for LLP. First, the amino acid values in Table 6 were compared as a ratio to the amino acid scoring pattern for older children to determine that the limiting amino acid is lysine (amino acid score 1.41). While a digestibility study has not been conducted on LLP, a study with a similar Lemna leaf protein concentrate was tested for standard ileal digestibility in pigs, with a resulting mean value of 81.70% for all amino acids (Stein, 2022). Assuming LLP would have a similar digestibility, the estimated PDCASS is 1.14, i.e., 1. With the amino acid profile shown in Table 6, digestibility of LLP could be as low as 71% and still produce a PDCAAS score of 1.

The fat content of duckweed is in the range of 4-7% (Appenroth et al., 2017). LLP has a specification of not more than 0.5% total fat. The fatty acid composition of duckweed is high in polyunsaturated fatty acids, ranging between 48 and 71%. Two polyunsaturated fatty acids, linoleic (18:2 n-6) and α-linolenic (18:3 n-3) acids, are essential for the human diet as they are not synthesized by humans and lack of intake results in adverse clinical symptoms (IOM, 2005). While duckweed would not likely become a major source of fatty acids in the human diet, in general a higher polyunsaturated fatty acid level including higher levels of n-3 fatty acids is favorable for meeting essentiality requirements and maintaining cardiovascular health (IOM, 2005; Gebauer et al., 2006; Djuricic and Calder, 2021). A comparison of the fatty acid composition of duckweeds and that of other plant seed oils is presented in Table 8.

Table 8. Human Essential Fatty Acid Composition of Duckweeds and Common Seed Oils

	Human essential Polyunsaturated fatty acids (% of total fatty acids)[a]	
	Linoleic acid (18:2 n-6)	α-Linolenic acid (18:3 n-3)
Duckweeds:		
Spirodela polyrhiza	11	44
Landoltia punctata	14	32
Lemna minor	20	44
Lemna gibba	13	49
Wolffiella hyalina	14	48
Wolffia microscopica	25	40
Common seed oils:		
Rape	22	10
Walnut	54	13
Soy	54	8
Olive	10	<1
Sunflower	72	<1
Palm	8	0

[a]Adapted from: https://analyticalscience.wiley.com/do/10.1002/gitlab.15597/full/.

The mineral content of duckweeds can be characterized as relatively rich in potassium and iron, and low in sodium . Duckweed samples also contained the trace elements manganese, zinc and copper. The mineral composition of duckweeds can be conveniently manipulated as the *in vivo* mineral contents depend on the composition of the nutrient medium being used for cultivation of these aquatic plants. The accumulation of trace elements can also be manipulated making it possible to have higher content of zinc, selenium, iodine or other required mineral components. Apart from minerals, these green plants also contain antioxidants like lutein, zeaxanthin and tocopherols and phytosterols, which have been investigated for their capacity to lower plasma cholesterol and LDL (low-density lipoprotein) cholesterol (Sree and Appenroth, 2018).

For all practical purposes, the chemical composition of the different species does not differ significantly and, to a certain extent, depends on the production process and nutrients used. Given this, safety data derived for one species can be used to support the safety of a similar species. Further, specifications are set on metals of safety concern, i.e., arsenic, mercury, cadmium and lead.

3. PART III. DIETARY EXPOSURE

3.1 History of Use of Duckweed/Water Lentils in the Human Diet

Duckweed, or water lentil, has been consumed by humans and been a component of human diets for a long period of time. In the 17th century, use of water lentils was extensively described in the

first Dutch medicinal plant guide: the "Cruydt book" (Rembertus Dodonaeus, 1644). According to the book, water lentils were recommended to treat a variety of illnesses.

Water lentils are a part of the human diet in southern Asia and are a common food in the traditional and small farmer groups (van der Spiegel et al., 2013). Burmese, Laotians and the people of northern Thailand have used water lentils as a nutritious vegetable for generations (Bhanthumnavin and McGarry, 1971). In Thailand, *Wolffia globosa* is referred to as "Khai-nam" or "eggs of the water," and is considered highly nutritious (Appenroth et al., 2018; van der Spiegel et al., 2013). Bhanthumnavin and McGarry (1971) and Rusoff et al. (1980) investigated some of the duckweed species and suggested them as a possible source of protein. *Wolffia globosa* is sold in the vegetable markets in different regions of Thailand. In these countries, fresh *Wolffia* plants are used to prepare several dishes like salads, omelets or vegetable curries (Saengthongpinit, 2017). A recent survey on *Wolffia* consumption in Loei province in Thailand, showed that the locals still consume *Wolffia* in traditional ways, such as using it either as a main ingredient (such as *Wolffia* crisps or "kaeng pum" - a popular vegetable dish in northeastern Thailand) or incorporating it in other foods such as *Wolffia*-meat ball, fermented *Wolffia*-meat sausage, *Wolffia* rice noodle, *Wolffia* cookies, *Wolffia* bread, and various soups and salads (Siripahanakul et al., 2013).

Along with its long history as a food source in Southeast Asia, duckweed, and specifically *Lemna minor*, is captured in several plant data bases including the USDA Natural Resources Conservation Service Plants Database (USDA Plants Database), the Tropicos Database (Tropicos | Name - Lemna minor) and the US National Plant Germplasm System (Simple Query Species Data GRIN-Global (ars-grin.gov)). The latter recognizes *Lemna minor* as an edible plant for humans and animals. Water lentils are also suggested for use as a food ingredient in many western dishes, such as *Wolffia* muffins, *Wolffia*-tomato sandwiches, *Wolffia* dip, and *Wolffia* pies (Armstrong, 2021). Water lentils are commercially available at rural farmers' markets (Godwin, 2014). Two species of water lentils, *Lemna minor* and *Spirodela polyrhiza*, are also included in a field guide for edible plants (Foraging Texas, 2014). Water lentils (species unknown) is also used as spice in another foraging guide (Urban Outdoor Skills, 2014).

Dried water lentils have high protein (30-45%, dry matter basis), calories (3,500-3,800 kcal/kg), and micronutrients (Appenroth et al., 1982; Cheng and Stomp, 2009; Men et al., 1995; Porath et al., 1979). High protein foods are important given that at least 900 million people globally suffer from hunger and malnutrition (World Hunger Education Service, 2012). Protein deficiency is common among large segments of the world population due to a shortage of protein and foods. In recent years, there has also been increased interest by consumers in the US and other developed nations in replacing animal protein with plant-based protein. The reasons for these changes vary from concern for personal health, economic, concern for animals, and lower environmental impact. Today, plant-based options for the diet include legumes, nuts and seeds and popular plant-based protein substitutes for meat protein include soy protein, pea protein, and spirulina. As the demand for nutrient dense plant-based protein has increased globally, many companies in the food and beverage, nutraceutical and animal feed industries have taken an interest in water lentils for a variety of applications in these areas. With minimal processing, water lentils are advertised as a protein source for meat alternatives, plant-based milks, sports nutrition, snacks, bakery applications, etc. Water lentils are advertised as a unique plant protein containing a complete

amino acid profile and are high in calcium, iron, vitamin A, vitamin B12, zinc, magnesium and antioxidants. Recent research has shown that water lentils are a good source of bioavailable iron and is efficient in reversing iron deficiency (Yaskolka et al., 2019). Water lentils also contain both lutein and zeaxanthin, two carotenoids recognized as important for eye and brain function (Stringham et al., 2019).

Given its rapid reproduction and small size, production of water lentils has become economically interesting as a source of plant-based protein. Increased interest in duckweed in research and applications of duckweeds are promoted by two organizations:
The International Lemna Association (ILA;
http://www.mobot.org/jwcross/duckweed/Duckweed_Organizations/Duckweed%20Organizations.html#International_Lemna_Association)
and the *International Steering Committee on Duckweed Research and Applications* (ISCDRA;
http://lemnapedia.org/wiki/ISCDRA).

The ILA is a non-profit organization whose mission is to promote the development of commercially viable markets for renewable and sustainable products derived from duckweed. Its membership consists of people, companies, and organizations across the value chain. ISCDRA organizes biennial international conferences on duckweed - Duckweed Research and Applications - and publishes a newsletter which serves as an informal means of distributing information to the duckweed community.
(ISCDRA News:
http://www.mobot.org/jwcross/duckweed/Duckweed_Organizations/Duckweed%20Organizations.html#ISCDRA_News).

There is a large volume of published information related to duckweed and its uses related to duckweed in both the popular press and in scientific publications. An important publication issued by the Food and Agriculture Organization (FAO) discusses the use, research, advantages, biology, benefits, etc. of duckweed in the industry and economy (Hassan and Chakrabarty, 2009). A significant number of research publications focus on the use of duckweed in animal feeds including fish, chickens, pigs and cows (Mwale and Gwaze, 2013; Rojas et al., 2014; Rusoff et al., 1980; Huque et al., 1996; Hasan and Chakrabarty, 2009). While these reports dwelt primarily on the efficacy of the use of duckweed in these applications, the peripheral safety data can be used to infer safety in humans and are discussed in Section 6. Water lentils are also consumed by a variety of wild animals, including ducks and other waterfowl, fish, and muskrats (Hillman, 1961).

There is also a large volume of published information in the popular literature related to the use of duckweed in human food including recipes, sources and quantity. For example, recipes for the use of water lentils (*Lemna minor*) are available from:

- Eating the Gap 2020 - "Water Lentils a.k.a Duckweed" - YouTube
  https://www.youtube.com/watch?v=aC3ixJHDYHY
- 5-Minute Recipes: Summer Spirodela Smoothie (planetduckweed.com)
  https://www.planetduckweed.com/post/5-minute-recipes-summer-spirodela-smoothie
- Water lentils, undated; Water Lentils: Delicious and Healthy, undated [available at;
  https://rubiscofoods.com/waterlinzen-kookboek/;

- Water Lentils: Health Benefits …. Undated [available at: https://www.thehealthyrd.com/water-lentils-health-benefits-and-low-lectin-recipes/].

These references were included to demonstrate that the utility of duckweed as a food source is generally recognized; inclusion is not intended to imply any health claims.

Myrthe de Beukelaar (2017) researched the acceptability of duckweed as a human food source. The research involved human perceptions and attitudes toward consumption of plant protein, etc. The author concluded "Providing information about the nutritional and environmental benefits of duckweed has a positive effect on duckweed acceptability as food for humans in the Netherlands, on condition that duckweed is used in a fitting meal vs. a non-fitting meal" ("The Effect Of Positive Information And Meal-Fit On The Acceptability Of Duckweed As Human Food, In The Netherlands"; https://edepot.wur.nl/416405; MSc Thesis MCB-80436). This illustrates the importance of introducing duckweed in appropriate contexts to increase its chance of acceptability in Western society. In a subsequent paper (de Beukelaar et al., 2019), the authors concluded that "… there appear to be no major objections from consumers against the introduction of duckweed as human food at a large scale."

Despite this strong history of safe consumption, little data are available on current levels of duckweed, *Lemna minor* or related leaf protein consumption. In the US, Lemna protein use is in its infancy and in the absence of such data, it is difficult to determine daily exposure to Lemna Leaf Protein or its preparations. Given this, an attempt has been made to determine the exposure to Lemna Leaf Protein based on the anticipated use levels of various products.

3.2 Intended Use Levels and Food Categories

Plantible's LLP is intended to be marketed as a food ingredient that provides protein and other nutrients (21CFR170.3 (o)(20)), and also serves in some uses as an emulsifier (o)(8) or gelation agent/thickener (o)(28). Intended uses include a variety of foods at levels consistent with cGMP in thefood categories described below. It is recognized that there are Standard of Identity requirements for some of these foods and these foods will not be referred by their commonly recognized names. It should be noted that the amount of LLP used in each food category can be guided by established recipes. Foods that are consumed by infants and toddlers, such as infant formulas or foods formulated for babies or toddlers, and meat and poultry products that come under USDA jurisdiction are excluded from the list of intended food uses of the subject LLP.

Plantible's LLP may be added to a variety of food products in categories of foods as defined in 21 CFR 170.3(n) and at inclusion levels consistent with cGMPs as shown in Table 9.

Table 9. Inclusion Rates of LLP in Target Food Categories

Food category CFR 170.3 (n)	Target Uses within the Food Category	LLP Proposed use level (%)
Baked goods and baking mixes	Cakes, cookies, crackers, crouton, grain- based bars, bread and similar products, fine bakery, doughs	1-10
Beverages	Functional drinks, sports and ready to drink beverages, non-alcoholic including soft drinks, coffee substitutes, and fruit- and vegetable-flavored gelatin drinks	4.1
Breakfast cereals	Museli, Ready-to-eat breakfast cereals, cereals and cereal primary derivatives	1-10
Frozen dairy desserts	Frozen dairy deserts and mixes, spoonable desserts and ice cream	1-5
Grain products	Pasta	1-10
Milk products	Milk drink products (specifically milk substitutes), spreads, dips, cream substitutes	6.25 for milk drinks 1-10% for others
Plant protein products	NAS reconstituted vegetable protein, meat imitates, dairy imitates, seafood imitates, poultry imitates, egg imitates, protein based nutritional bars	1-20
Processed fruit and fruit juices	Commerciallly processed fruits, citrus, berries and mixed fruits; fruit/vegetable juices and nectars	Up to 5% for fruits Up to 6.25% for juices/nectars
Snack foods	Snacks, e.g., pretzels, chips, popcorn	1-10%
Soft candy and confections	Desserts and mousses Confections including chocolate, coatings, fillings, dessert sauces/toppings	Up to 5% for desserts/mousse 1-10% for others
Soups and soup mixes	Soups and soup mixes	Up to 5%
Other	Salad dressings, savory extracts and sauce ingredients	Up to 5%

LLP is not intended for use in infant formula or those products that come exclusively under USDA's jurisdiction.

These categories are consistent with those included in GRN 742 for LENTEIN™ Complete. A few categories listed in GRN 742 are not included (i.e., fresh fruit and fruit juices, processed

vegetables, hard candy and jams/jellies). In addition, a few uses in salad dressings and savory sauces are intended for LLP.

3.2.1 Estimated Daily Intake from the Intended Uses

The intake profile (amount and frequency) by individuals in USDA's What We Eat in America (WWEIA) Continuing Survey of Food Intakes by Individuals 2017 (WWEIA, 2017 – 2020 pre-pandemic) was used to calculate the estimated daily intake (EDI) of LLP for individuals consuming the target foods. The full report is found in Appendix 3.

Table 10 below shows the EDI levels at the mean and 90th percentile for the user population, stratified by age groups.

Table 10. EDI Levels for Mean and 90th Percentile Users of LLP based on WWEIA 2017-2020 Pre-Pandemic Data

Age (Years)	Mean Intake (g/day)	Mean Intake (g/kg bw/day)	90th Percentile Intake (g/day)	90th Percentile Intake (g/kg bw/day)
1-5	22.8	1.4	41.6	2.7
6-12	31.4	0.91	52.3	1.7
13-19	33.8	0.52	62.1	0.98
19+	31.8	0.39	63.0	0.77
2+	31.5	0.50	61.1	1.0

For the 2+ age group, the 90th percentile consumption by users is 61.1 g/day or 1.0 g/kg bw/day. The highest intake on a body weight basis is for ages 1-5, which was 2.7 g/kg bw/day.

The intended use of Plantible's LLP in largely the same foods and at similar levels as those in GRN 742 is not expected to noticeably increase the intake of lemna protein in the overall diet of the public from introduction into the market by another supplier, who will have to compete in essentially the same markets and foods. The intake assessment conducted for GRN 742 estimated that when consumed in the intended foods at 1-24 g/serving (inclusion rates of 3-20%), mean intakes would be approximately 100 g/day and high intake consumers would consume approximately 201 g/day of the product. These values are much higher than estimated intakes for LLP as shown in Table 10. It was noted that the assessment methodology used resulted in an overestimate of intake. In follow-up described in the FDA's response letter of August 22, 2018 (https://www.fda.gov/media/116248/download), FDA indicated that Parabel states that duckweed powder (i.e., LENTEIN™ Complete) would be used as a general protein source in food. At the

request of FDA, Parabel provided an estimate of exposure based on a budget-type analysis, where a portion of the protein added to the diet would be replaced by duckweed powder. The estimate assumes that 50% of protein in the diet is added, and that duckweed powder would account for 25-50% of the added protein in the diet. The budget-type analysis provided a revised estimate of dietary exposure of 27.8-55.6g per person per day. FDA indicated no further questions, with the duckweed product described in GRN 742 intended use as a source of protein in the named food categories at a level of 3-20%. The Expert Panel that reviewed Plantible's GRAS determination for LLP in November, 2022 was presented with the food categories, inclusion levels and dietary intake assessment for LENTEIN™ Complete and agreed that LLP could be used safely under the same intended uses, with adjustment to the rate of addition to food categories to maintain the same protein level per serving (Appendix 7). While LLP has a higher proportion of protein than LENTEIN™ Complete, in the current intake assessment most products are included at 10% or less with the exception of plant protein products.

Most of the population's protein intake is derived from, and will continue to be derived from unprocessed foods, including meat, poultry, fish, and legumes. Moreover, for those processed foods to which the LLP will be added, there are competitive products on the market. Thus, the addition of LLP simply will serve as a replacement for these other competitive protein sources and will not increase consumer exposure to protein. Therefore, Plantible does not realistically expect that the actual consumption of foods containing LLP will contribute to a significant portion of total protein intake.

4. PART IV. SELF LIMITING LEVELS OF USE

Use levels of Plantible's LLP will be driven by cGMP and published recipes. At high levels of protein, food products can become bitter and unpalatable. Also, because of the physical properties of proteins, and their high water-binding properties, excessive levels can make the food product dry, dense and difficult to manufacture. Plantible anticipates that the practice will be to use LLP as a substitute for other plant and animal proteins and will not affect the overall consumption of protein in the diet. Additionally, the cost of the product will also prohibit excessive use.

5. PART V. EXPERIENCE BASED ON COMMON USE IN FOODS BEFORE 1958

The statutory basis for the conclusion of GRAS status of Plantible's LLP in this document is not based on common use in food before 1958. The GRAS conclusion is based on scientific procedures. However, as described in this document, LLP has been historically consumed as a food and as an ingredient in food prior to 1958, providing support that it has been safely used in food products.

6. PART VI. NARRATIVE

6.1 Introduction

It is accepted and recognized that duckweed has been, and is currently used, in human and animal food. Further, sufficient published information supports the fact that duckweed is used in human and animal food for both historical and current uses without any reported adverse effects. This information indicates that proposed use of Plantible's LLP as a food ingredient in selected foods for humans is unlikely to cause adverse effects. Additional pertinent safety data that support the use of duckweed in food are found in a GRAS Notice (GRN 742; available at: https://www.accessdata.fda.gov/scripts/fdcc/index.cfm?set=GRASNotices&id=742), which permits the use of duckweed-based LENTEIN™ Complete in food products at levels ranging from 1.0 – 24 grams/serving. Information in GRN 742 is hereby incorporated by reference into this document. The available scientific studies and use of scientific principles support the safe consumption of LLP under the conditions of intended use described in Section 3.

In support of this determination that Plantible's LLP product is GRAS, Plantible has considered the data developed in GRN 742 that were submitted to FDA in support of Parabel Ltd's Lemna protein product, called LENTEIN™ Complete. FDA evaluated the safety data for the components of Lemna protein powder in GRN 742 for use as an ingredient in food. Parabel's Lemna protein product is produced from a mono or poly-culture of the Lemnaceae family, generally consisting of plants in the *Lemna* genus (20%-100%), *Wolffia* genus (0 - 80%), *Wolfiella* (0 – 30% of the crop) and *Landoltia* (0 - 30% of the crop). The FDA issued a "No Objection" letter for the use of Lemna protein at levels ranging from 1 to 24 grams per serving in a variety of food products as per GRN 742. The data included extensive feeding data, and toxicology studies in rats up to 90-days in duration. Based on the data submitted, the submitter concluded, that there were no apparent safety issues related to the intended uses. Plantible has reviewed all safety data included in GRN 742 and has determined that these safety data are also applicable to Plantible's LLP product as the products are compositionally very similar as shown in Table 11. Both products are an extracted and purified form of Lemna protein. Plantible's LLP contains ≥80% protein, while the protein content in the product in GRN 742 is 39-55% crude protein (up to ~50% on an 'as is' basis). The difference is made up by fiber, ash and fat components. As discussed above, Plantible's LLP has a profile and content of essential amino acids that resemble that of GRN 742 LENTEINE™ Complete protein product. Therefore, the safety data for Lemna protein powder (GRN 742 pages 61 to 106) are incorporated by reference into this document for Plantible's LLP.

Table 111. Compositional Similarity Supporting Incorporation of Safety Data from Parabel to Plantible Lemna Protein Powders

Parameter	Parabel LENTEIN™ Complete	Plantible LLP
Source	Mono or poly-culture of Lemnaceae containing 20-100% Lemna genus	Lemna minor
Moisture	NMT[a] 10%	NMT 10%

Parameter	Parabel LENTEIN™ Complete	Plantible LLP
Crude protein	39-55% dw ~ 40-50% as is basis[b]	NLT[a] 80% as is basis ~ 89% dw
Fat	NMT 12% dw Maximum 10% on as is basis	NMT 0.5% as is basis
Ash	NMT 10% dw 4-8% as is basis	NMT 4.5% as is basis
Dietary Fiber	30-45% dw 30-45% on as is basis	NMT 15% as is basis
Oxalic Acid	NMT 0.1% as is basis	NMT 0.1% as is basis

[a]Abbreviations: NMT = not more than; NLT = not less than; dw = dry weight, or dry matter basis
[b] Typical composition of LENTEIN™ Complete on an as is basis found in Table 10 of GRN 742.

In addition, consideration was given to the safe consumption of Rubisco, the most commonly consumed plant-produced protein. A review of recent clinical trials with duckweed-derived proteins was conducted. Finally, the global regulatory reviews of duckweed and related protein extracts were considered (Appendix 4).

6.2. Safety of Rubisco Proteins

Rubisco (sometimes abbreviated RuBisCO) is the major protein within LLP. Rubisco is an enzyme, ribulose-1,5-bisphosphate carboxylase/oxygenase (CAS Reg. No. 9027-23-0; EC 4.1.1.39) that is present in all leafy plants. This enzyme is responsible for the first step in photosynthesis, the incorporation of atmospheric CO_2 (Calvin cycle). The protein is located in the stroma of the chloroplasts in the plant cell (Ellis, 1979). The proteins in green leaves are divided into green and white fraction proteins (Nynas, 2018), with the white fraction mainly composed of Rubisco.

Rubisco catalyzes both the carboxylation and oxygenation of ribulose-1,5-bisphosphate (RuBP) to yield either two 3-phosphoglycerate molecules or one 3-phosphoglycerate and one 2-phosphoglycolate. It is the most widespread carbon-fixing enzyme, being present in more than 99.5% of autotrophic organisms (Bathellier et al., 2018). The mechanism of action is well understood. Further, Rubisco is considered not to be a "promiscuous" enzyme as it is not known to catalyze any significant reaction on a substrate other than RuBP (Bathellier et al., 2018). This mode of action is not toxic to human and animal, as evidenced by the long history of consumption of the enzyme.

When Rubisco first was discovered, it was termed Fraction I protein (Wildman and Bonner, 1947). There are since other forms identified, however Fraction I (also called Type I or Form I) is the most ubiquitous in nature and the form that is relevant to this discussion (Tabita et al., 2007). Rubisco Form I comprises both large (catalytic) and small subunits to form a large hexadecameric protein structure. Overall sequence conservation between lineages in the Rubisco large-subunit superfamily is on average 31% amino acid sequence identity across the 193 nonredundant, full-length sequences analyzed. Importantly, sequence conservation is much higher within certain

lineages and is 85% similar for Viridiplantae (Streptophyta, Chlorophyta) (Tabita et al., 2007). This high level of similarity provides confidence in the comparison of nutritional value and safety across various leafy plant Rubisco proteins.

Given its fundamental role and ubiquitous nature, Rubisco is thought to be the most abundant protein on earth. A recent estimate by Bar-on and Milo (2019) suggested the total mass of Rubisco on Earth is ~0.7 Gt, more than an order of magnitude higher than previously thought. Importantly, the authors estimated that >90% of Rubisco enzymes are found in the leaves of terrestrial plants, and that Rubisco accounts for ~3% of the total mass of leaves (Bar-on and Milo, 2019). Moore et al. (1995) estimated that Rubisco makes up to 20 - 25% of the soluble protein in leaves. By contrast, Feller et al. (2008) reported that Rubisco is the most abundant protein in leaves, accounting for 50% of soluble leaf protein in C_3 plants (20–30% of total leaf nitrogen) and 30% of soluble leaf protein in C_4 plants (5–9% of total leaf nitrogen). Van de Velde et al. (2011) also estimated that Rubisco can make up to 50 per cent of the total amount of the protein fraction; however, they stated that the concentration of Rubisco obtained from green leaves depends upon many factors, such as the age of the plant at the time of harvest, the species, the growing conditions (such as light intensity and nitrogen availability) and the efficiency of the method used to extract the protein.

Rubisco extract has been analyzed to compare its nutritional value to other proteins. Rubisco extracted from sugar beets showed comparable or superior functional properties to those of whey and soy protein isolates (Martin et al, 2019). Leaf proteins, and more specifically Rubisco, were proposed as a potential source of food protein for human consumption in the 1940's (Pirie, 1942), and more recently (Barbeau and Kinsella, 1988; DiStefano et al., 2018). It is widely available in green waste material in agriculture and in nature. The amino acid composition of the protein is favorable for human consumption, as essential amino acids are present in significant amounts (de Jong and Nieuwland, 2011). Animal studies have confirmed the digestibility of leaf protein concentrates (Carlsson and Hanczakowski, 1985; Subba Rau et al., 1972), and a study on the nutritional value of leaf protein concentrates as food supplements for children has shown effects comparable with those of milk (Shah et al., 1980). A pilot study with leaf protein concentrate prepared from the annual legume Berseem was conducted in children with protein energy malnutrition (Dewan et al., 2007). In this study, children who received leaf protein concentrate in their diet for two weeks showed significant improvement in weight and hemoglobin levels.
Rubisco is known to be rapidly and completely degraded at low pH in the presence of pepsin; potential allergenicity of a protein has been linked with resistance to degradation by proteases, such as pepsin (Wang et al., 2017).

The functional properties of this protein make it useful in food applications (Douillard and de Mathan, 1994). Native Rubisco has been shown to be a good gelling and foaming agent, and fibrillary structures with meat-like texture have been made (Pouvreau et al., 2014).

The literature related to Rubisco is very large, and a bibliography of reviews is provided in Appendix 5. Most of the literature is related to mechanistic interpretations of Rubisco in photosynthesis and efforts to improve photosynthesis in leafy plants. Very little is available related to evaluation of nutritional value or safety. This is not surprising, given the ubiquitous nature of the protein and the fact that all humans consume Rubisco in some form from leafy plants or food

products derived from them. No adverse effects have been attributed to consumption of Rubisco. Therefore, de facto, Rubisco is considered to be safe for human consumption.

6.3 Nonclinical Safety Studies

6.3.1 In vitro

Extracts from seven duckweed species (including *L. minor*) were tested for cytotoxic effects on the human cell lines HUVEC, K-562, and HeLa and for anti-proliferative activity on HUVEC and K-562 cell lines (Sree et al., 2019). There was no evidence that suggested that duckweeds had any detectable anti-proliferative or cytotoxic effects.

The Ames assay and the *in vitro* micronucleus test were conducted to examine the genotoxicity potential of a dried powder from the related species, *Wolffia globosa*, which is also known as 'Mankai' (Kamawata et al., 2020). The *W. globosa* extract was >40 % protein on a dry matter basis. A reverse mutation (i.e., Ames) assay was conducted with *Salmonella typhimurium* TA98, TA100, TA1535, and TA1537, and *Escherichia coli* WP2 *uvrA* according to OECD Method 471. After a dose range finding study, the main study was conducted at five dose levels (313; 625; 1250; 2500; and 5000 μg/plate) with or without metabolic activation (S9), and results showed no potential to induce gene mutation.

The potential of dried Mankai powder to induce chromosomal aberrations was assessed by an *in vitro* micronucleus test using human lymphoblastoid (TK6) cells with or without metabolic activation by rat liver S9 fraction according to OECD Method 487. The frequency of cells with a micronucleus did not show a significant increase at any dose levels in any treatment compared with those of the negative control group (Fisher's exact test, $p > 0.05$); therefore it was determined that the test article did not induce chromosomal aberrations under the conditions of the study. Given the similarity in the composition of duckweeds, it is reasonable to assume that LLP is also not genotoxic. The frequency of cells with a micronucleus did not show a significant increase at any dose levels in any treatment schedules compared with those of the negative control group (Fisher's exact test, $p > 0.05$).

Extracts of *L. minor* were investigated for potential immune modulation effects. *L minor* was macerated, and solvent extracted to obtain four fractions containing polyphenols, flavonoids, triterpenes and flavan-3-ols. Extracts were added in increasing concentrations (2.4 ng/ml to 2 μg/ml) to isolated mononuclear cells from four subjects. After 24, 48 and 72 hours the total number of mononuclear cells and the CD4+, CD8+ and B cell populations were counted by flow cytometry. The Lemna extracts were not cytotoxic and did not cause cell necrosis or apoptosis in immune cells. The authors concluded there was no immunomodulatory activity of Lemna extracts (Catelani Cardoses et al., 2021).

6.3.2 Absorption, Distribution, Metabolism and Excretion (ADME)

As discussed in GRN 742 (Section II Page 38), the Lemna Protein will be digested like any other protein, by normal metabolic processes.

6.3.3 Toxicology/safety and Feeding Studies

In vitro Assay

As described above, there was no evidence that suggested that duckweeds have any detectable anti-proliferative or cytotoxic effects (Sree et al., 2019), genotoxicity (Kamawata et al., 2020), or immunomodulatory activity (Catelani Cardoses et al., 2021).

In vivo Studies

FDA has evaluated the safety data for the components of Lemna protein (whole *Lemnaceae*) powder in GRN 742 for use as an ingredient in food. The FDA issued a "No Objection" letter for the use of Lemna protein at levels ranging from 1 to 24 grams per serving in a variety of food products as indicated in GRN 742. The proposed use of Plantible's LLP as a food ingredient is similar to those described in GRN 742, with an EDI of 61.1 g/day or 1.0 g/kg bw/day for the 90th percentile consumption by users aged 2+ years. GRN 742 estimated that intake of a lemna protein powder by a high-end consumer would be approximately 201 g/day or 2.87 g/kg bw/day assuming an average adult weight of 70 kg. Using the budget analysis for dietary intake, GRN 742 estimated dietary exposure of 27.8-55.6 g per person per day, or 0.39-0.79 g/kg bw/day. The data included extensive feeding data, and toxicology studies in rats up to 90-days in duration. Many of the studies discussed in GRN 742 (Section VI Pages 66-72) included feeding studies that studied the efficacy and digestibility of the Lemna Protein Concentrate in numerous species, including swine, poultry, fish and shrimp. Other studies investigated various preparations of water lentils (Section VI Pages 72-89) in poultry, ducks, cattle, pigs, sheep, rats, and fish. No apparent safety concerns were reported in these feeding studies, as indicated in GRN 742.

Besides the numerous feeding studies with animal species that show that *Lemna minor* is safe for animals to consume, it also had been consumed by animals including wildlife and managed livestock for decades.

It is frequently observed that animals, such as ducks, swans, or geese, feed on duckweeds growing naturally in ponds or lakes. This is where the common name, duckweed, comes from. These plants have also been used for a long time to feed domesticated animals, either by providing them temporary access to duckweed grown ponds or by supplementing their diet with harvested duckweed, fresh or dried**.** In many parts of the world, duckweeds are consumed by domestic and wild fowl, fish, herbivorous animals, and humans (Boyd, 1968; Chang et al., 1977; Culley et al., 1973; Rusoff et al., 1977; Rusoff et al., 1978). Landolt (1986) detailed reports of feeding duckweed to pigs as early as the 1960s, and later reports with cattle, rams, sheep, horses, waterfowls, and fish**.** Since the 1970s, duckweeds have attracted considerable attention for their high protein content, fast accumulation of biomass compared to terrestrial plants, and ability to absorb nutrients and other chemicals (see the reports and reviews of Skillicorn et al., 1993; Iqbal, 1999; Hasan et al., 2009; Mwale et al., 2013). In the 1960s and 1970s, this fodder plant was well

known and used to feed waterfowl and pigs (Lassociński, 1979). The World Bank supported a project to feed fish with duckweeds in Bangladesh (Skillicorn et al., 1993). More recently, detailed reports were published in this regard, e.g., using *Wolffia arrhizal* meal as a substitute for soya in the diet of Japanese quails (Suppadit et al., 2012), using duckweed species in the feed of striped catfish (Da et al., 2013), rohu and carp (Sharma et al., 2016) and broilers (Shammout and Zakaria, 2015).

Duckweed has an advantage over other protein sources is that it is characterized by better availability and absorption of amino acids, including lysine and methionine, as well as of vitamins. It is rich in leucine, threonine, valine, isoleucine, and phenylalanine (Goopy and Murray, 2003). Many studies have confirmed the appropriateness of feeding duckweed to farm animals: poultry – ***ducks, laying hens, and broiler chickens*** (Haustein et al., 1992 and 19944; Samnang, 1999; Moyo et al., 2003; Ahammad et al., 2003; Khandaker et al., 2007; Akter et al., 2011; Anderson et al., 2011; Mwale and Gwaze, 2013); ***pigs*** (Rodríguez and Preston, 1996; Du et al., 1997; Men et al., 1997; Van et al., 1997; Nguyen, 1998; Gutierrez et al., 2001; Ly et al., 2002; Du et al., 2009; Rojas et al., 2014; Gwaze and Mwale, 2015); ***ruminants – cattle, sheep, and goats*** (Rusoff et al., 1978, 1980; Huque et al., 1996); ***as well as fish and shrimps in aquaculture*** (Hassan and Edwards, 1992; Leng et al., 1995; Bairagi et al., 2002; Pipalova, 2003; El-Shafai et al., 2004; Yilmaz et al., 2004; Effiong et al., 2009; Hasan and Chakrabarty, 2009).

Single Dose Toxicology Study in the Rat

GRN 742 Part 3 Appendix O contains excerpts of the toxicology safety studies conducted with the similar protein extract, LENTEIN™ Complete.

GRN 742 reports a single dose oral toxicity study conducted with LENTEIN™ Complete in Wistar rats. The study followed the OECD Guidelines for testing of chemicals (Number 420).

A LENTEIN™ Complete sighting study at limit dose level of 2000 mg/kg body weight (bw) was conducted using one female rat, fasted overnight prior to dosing (approximately 16 hours) and observed until 4 hours after the dosing in the first step. LENTEIN™ Complete was administered orally by gavage. No toxic signs and symptoms or mortality was noticed in the sighting study, hence the main study was performed with four female rats, which were administered orally with the same dose of 2000 mg/kg bw. No mortality, toxic signs and symptoms, or changes in body weight were observed in any of the animals. At the completion of observation period of 14 days, all the animals were sacrificed and subjected to gross pathological examination and did not reveal any pathological changes. Under the conditions of this study, no toxic signs and symptoms or mortality were observed in any of the animals at the dose level of 2000 mg/kg bw.

14-Day Oral Toxicology in the Rat

GRN 742 reports a dose range-finding study that was conducted in Wistar rats (3/sex/ group). Rats were administered LENTEIN™ Complete at the dose levels of 0, 100, 500, and 1000 mg/kg bw for 14 days consecutively orally by gavage. The control group was administered corn oil (vehicle) only for 14 days. After 14 days the test and control group animals were necropsied. No treatment related toxic sign and symptoms/mortality were observed.

90-Day Subchronic Toxicology Study in the Rat

GRN 742 also reports a 90-day repeat dose oral toxicity study with LENTEIN™ Complete in Wistar rats (10/sex/group). The study followed the OECD Guidelines for testing of chemicals (Number 408). Rats were administered LENTEIN™ Complete at the dose levels of 0, 100, 500, and 1000 mg/kg bw for 90 days consecutively orally by gavage. The control group was administered corn oil (vehicle) only for 90 days. Two additional groups (Recovery Groups, 5/sex/group) were administered 0 or 1000 mg/kg bw/day for 90 days, followed by 28 days of observation. All animals were evaluated for changes in appearance, behavior, toxic signs and symptoms, morbidity, mortality, body weights, feed consumption, hematological and biochemical analysis, urine analysis, neurobehavioral observation, ophthalmological examination, organ weights, necropsy and histopathology. After 90 days the test and control group animals were necropsied. No treatment related toxic signs and symptoms/mortality were observed as compared to the Control Groups.

A 90-day rat study designed according to OECD 408 was also conducted with dried Mankai powder from *Wolffia globosa* (Kawamata et al., 2020). Six-week-old SD rats [Crl:CD(SD)] rats were distributed randomly to four groups of 10 male and 10 female rats per group according to body weight. Mankai was provided in the diet at 0 %, 5 %, 10 %, or 20 % (w/ w) levels for 91 days. Overall, the mean test article intake throughout the administration period was 3.18, 6.49, and 13.16 g/kg/day for males and 3.58, 7.42, and 15.03 g/kg/day for females at 5%, 10 %, and 20 % (w/w), respectively. There were no mortalities during the administration period and no test article-related changes in clinical observations, detailed clinical observations, manipulative tests, measurement of grip strength and motor activity, body weight, food consumption, ophthalmology, plasma hormone levels, organ weight, necropsy, and histopathology.

There were a few differences noted in urinalysis and hematological parameters that were not deemed to be of toxicological significance. For example, decreases in total cholesterol, phospholipid, calcium, and inorganic phosphorus in males at 20 % (w/w) Mankai in the diet and increases in glucose and blood urea nitrogen in females at 20 % (w/w) Mankai in the diet were small changes and individual values were generally within the historical control data in the test facility. The no observed adverse effect level (NOAEL) of Mankai under these study conditions was judged to be 20 % (w/ w) for both males and females, i.e., 13.16 and 15.03 g/kg/day for males and females, respectively. Since no abnormalities were detected up to a very high dose level, i.e., 20 % (w/w), Mankai was considered to be a food with no toxicity concerns and an excellent nutritional balance. EFSA (2021) reviewed this study as part of a novel food (NF) application. In their analysis EFSA said, “A number of significant findings were seen in the urinalysis, haematology, blood chemistry and organ weights, in the animals fed with the NF. Most of these findings were considered as treatment-related, but the mode of action cannot be explained. Considered on their own, many of them will not be considered as adverse. However, taking together statistically significant outcomes especially for the high dose groups and the lack of a plausible explanation, the Panel considers the middle dose tested for males (i.e., 6.5 g/kg bw per day) as the overall no observed adverse effect level (NOAEL) of this study”.

Yaskolla Meir et al (2019) demonstrated that Mankai supplementation to female rats that had been on an iron deficiency anemia–inducing diet was able to help restore hemoglobin concentrations after 22 days of feeding. While not designed as a safety study per se, this study adds to the weight of evidence that consumption of duckweed does not result in adverse effects.

Safety and Feeding Studies in Other Species

Parabel tested a Lemna Protein Concentrate in a variety of animal species. Lemna Protein Concentrate is a plant protein concentrate powder produced from Parabel's Lemnaceae aquatic plants that contains a similar amino acid profile, but higher level of total protein compared to LENTEIN™ Complete (60-70% vs up to 55% protein). The influence of Lemna Protein Concentrate on piglet performance was reported in GRN 742. One hundred and twenty (120) newly weaned crossbred piglets, averaged 6.56 kg body weight, were allocated to two treatment diets, each diet with 4 replicate pens of 15 piglets per pen. The two treatment diets were formulated for each growing phase with either fish meal or Lemna Protein Concentrate at 4% during weeks 1-2 and dropping down to 2% in the diet for weeks 3-4. Body weight, daily feed intake, average daily gain, feed conversion ratio, livability, performance index and overall health score were calculated. It was concluded that Lemna Protein Concentrate outperformed fishmeal as a dietary supplement for weaned piglets.

In addition, the influence of Lemna Protein Concentrate on broiler performance was also reported in GRN 742. This study was conducted to measure the response of male Ross 308 birds to Lemna Protein Concentrate inclusion in typical commercial Southeast Asian broiler diets. Two hundred and forty (240) newly hatched broiler chicks of commercial strain (Ross 308) were randomly allocated to 3 treatments with 8 replications using 10 male chicks in a pen as an experimental unit. Three test diets for each growing phase were formulated with no addition, or fish meal or Lemna Protein Concentrate. Either the fishmeal or Lemna Protein Concentrate was added at 2% from Days 0-10, 1% at Days 10-24, and was not added at all during Days 24-35. Feed consumption and body weight as pen basis were measured during the period of 0-10, 10-24 and 24-35 days of age to calculate body weight gain (average final body weight – average initial body weight) and feed conversion ratio (pen feed intake / pen weight gain). Individual feed intake was calculated by average body weight gain multiplied by feed conversion ratio. Livability was calculated by 100 – (% death + % culls). The feed conversion ratio was slightly higher in the Lemna Protein Concentrate group on Days 0-10, otherwise, there were no apparent changes in any other parameter.

Since GRN 742 was submitted to the FDA, additional publications also indicate that *L. minor* is safe as an ingredient in animal and fish feed and is preferred as a protein substitute for soybeans due to cost factors. Herawati et al. (2020) found that feeding of tilapia using fermented *L. minor* meal has a significant effect ($P<0.05$) on total feed consumption, feed utilization efficiency, protein efficiency ratio, and relative growth rate, and had no significant effect ($P>0.05$) on survival rate. Common carp *Cyprinus carpio* fed *L. minor* up to 20% of diet (dw) had higher final weight and enhanced protein, lipid, amino acids and n-3 fatty acid content in the meat compared to carp fed a control diet with soybean meal as the major protein source (Goswami et al., 2022). In another study with rohu *Labeo rohita* fingerlings, diets containing 300 g/kg protein were formulated using either fishmeal as the control or a 1:1 mix of fish meal with a plant ingredient, including *L. minor*. The feed conversion ratio was lower for the group fed *L. minor* compared to control, showing

efficient utilization of the diet. The authors concluded that raw duckweed could be included in fish feed at this level without negatively affecting growth (Goswami et al., 2020).

In summary, there are many reports of well-established uses for duckweed in animal feeding. Although these reports typically focused on utility, these reports point to the fact that duckweed is safe in a variety of different uses. An excellent review of use of duckweed in livestock feeding and aquaculture is provided by Sonta et al. (2019).

Nonclinical safety studies with related aquatic plant proteins similar to duckweed protein have also been reported. Wu and Sun (2011) evaluated the safety of a water hyacinth leaf protein concentrate (WHLPC) in mice. The LD_{50} of WHLPC in mice was more than 20.5 g/kg bw. After feeding mice for 7, 30, 60 or 90 days, either on a diet containing WHLPC or a control diet of equivalent protein content, there were no significant differences in absolute body weight or weight gain of WHLPC-treated mice. The results of hematological analysis, histopathological evaluation, and necropsy did not show any adverse effects from diet containing WHLPC. It was concluded that there were no toxicological effects when water hyacinth leaf protein concentrate was administered to mice at single and repeat dosages for up to 90-days. While water hyacinth is from a different family (species name *Eichhornia crassipes Mart. Solms*), the results may be pertinent in the broader context of safety of water plants.

Presence and Safety of Minor Components

Contaminants, including heavy metals, are not expected to be a concern for Plantible's LLP, as *L. minor* will be grown under controlled and monitored conditions. Plantible will test heavy metals on a periodic schedule even though heavy metals are not expected to be a concern as Plantible will use only potable water in the production of LLP. Further, Plantible's proprietary extraction process incorporates both a 0.2µm microfiltration step as well as an ultrafiltration step using a 70kDa membrane to ensure that contaminants as well as heavy metals are removed from the protein composition prior to drying. A specific concern related to manganese (Mn) was raised by EFSA in their review of Parabel Ltd's LC product (EFSA, 2021b). In the analyses submitted by the company to EFSA, Mn levels ranged from 128-333 ppm across seven batches. The company set a specification at <250 ppm.

While the EFSA Panel noted that no upper limit has been set for manganese in the EU, they cited a SCF/NDA 2006 report that stated that 'oral exposure to manganese beyond the normally present in food and beverages could represent a risk of adverse health effects without evidence of any health benefit'.

In contrast, the average Mn level in LLP is 11.4 ppm (Appendix 2). At the 90^{th} percentile EDI of 61.1g of LLP/day this would equate to an additional consumption of 10 µg Mn/kg bw/day. (That is, 11.4 mg Mn/kg LLP x 0.0611 kg LLP consumption /70 kg bw = 0.01 mg Mn/kg bw/day or 10 µg Mn/kg bw/day). As this represents complete replacement of protein sources in target food categories it is likely an over-estimate of actual Mn consumption from LLP.

In the US, the average adult intake for Mn ranges from 0.7 to 10.9 mg/day, which is 10–156 µg Mn/kg bw/day, assuming a 70-kg body weight (ATSDR, 2012). A tolerable upper limit for adults has been set at 11 mg/day (IOM, 2001; summarized at Manganese - Health Professional Fact Sheet (nih.gov)).

Plantible has also added a very conservative specification for oxalic acid as their production process shows no detectable oxalic acid in the finished product. Parabel set the same specification of <0.1% in GRN 742. For context, the level of oxalic acid in the related *Wolffia globosa* (Mankai) has been evaluated by Lapidot et al. (ISCDRA, 20202b) and the authors concluded that the amount of oxalic acid in *Wolffia globosa* (Mankai) "… is moderate, much lower than that found in green vegetables such as spinach, broccoli or lettuce." (The results were reported in volume 8 (pages 25 – 30) of the Duckweed Forum (ISCDRA, 2020b)

The safety of other components/metabolites of duckweed have also been investigated and expected consumption levels were below any safety concerns for nucleic acids, carotenoids, phytic acid, protease and trypsin inhibitors, tannins, biogenic amines, and fiber/cellulose (GRN 742 Page 31, 94, 95, 96, 97, 98, 99, 99-103, respectively).

Additionally, safety hazards for duckweed may include the presence of pesticides and pathogens (van der Spiegel, 2013). As with Parabel's LENTEIN™ Complete, Plantible produces LLP in modern hydroponic ponds where environmental contaminants such as pathogens and pesticides are not present and are closely monitored.

6.3.4 Nonclinical Studies with Other Leaf Proteins

Goel et al. (1977) fed a leaf protein concentrate prepared from cauliflower leaves to rats (4/sex/group) for four weeks. The concentrate was analyzed for crude protein, calcium, phosphorus, iron, β-carotene and some of the amino acids. Lysine and tryptophan were present in nutritionally adequate amounts, but cystine and methionine were not. Cauliflower leaf protein concentrate was evaluated for its nutritional qualities in respect to growth rate, protein efficiency ratio, liver nitrogen, and plasma protein content by feeding rats. The growth rate of rats and protein efficiency ratio values of leaf protein supplemented diets were better than that of the wheat flour fed group. The authors concluded that cauliflower leaf protein concentrate might be used for improving nutritionally poor diets.

Igarashi et al. (1997) studied the effects of cabbage leaf protein concentrate on serum and liver lipid concentrations in male Wistar rats (5/group) fed cholesterol-enriched and cholesterol-free diets. It was determined that cabbage leaf protein concentrate lowered serum and liver cholesterol as well as triacylglycerol in rats fed a cholesterol-enriched diet and lowered both liver triacylglycerol and total cholesterol concentrations in rats fed a cholesterol-free diet.

A protein quality evaluation was done in male Wistar rats (4/group) with leucocephala leaf meal and leaf protein concentrate prepared from the leucocephala leaf meal as protein sources in diets (Farinu et al., 1992). Rats were fed ad *libitum* for 14 days and the results for the test diets compared with the control soya bean and sorghum diet. The leaf protein concentrate diet supported growth in rats but gave lower crude protein digestibility values than the control diet of soya bean and

Guinea corn. The low in-vivo crude protein digestibility of the leucocephala leaf meal compared with the leaf protein concentrate may be attributed to its high crude fiber content and presence of the antinutrient mimosine and/or tannin.

Fasuyi and Aletor (2005) studied cassava leaf protein concentrate as a replacement for fish meal as a protein source in broiler starter diets for chickens. The authors looked at the effects on performance, muscle growth, hematology and serum parameters. The cassava leaf protein concentrate had no deleterious effects up to 60%; however, 40% replacement seemed optimal.

As discussed previously, a large component of most leaf proteins is Rubisco, which has a strong history of safe use.

6.3.5 Summary of Nonclinical Studies

There is no evidence that duckweed extracts have anti-proliferative or cytotoxic effects, genotoxicity, or immunomodulatory activity. There was no mortality or signs of toxicity observed in an acute oral toxicity study in rats administered a Lemna protein concentrate by gavage at 2,000 mg/kg body weight (bw), the highest dose tested. No adverse toxicological effects were observed from a subchronic 90-day oral toxicity study in rats administered a Lemna protein concentrate by gavage, up to 1,000 mg/kg bw/day, the highest dose tested. Similarly, no adverse toxicological effects were observed from a subchronic 90-day oral toxicity study in rats administered a related *Wolffia globosa* protein concentrate in the diet up to 13-15 g/kg bw/day. No adverse effects in feeding studies in a variety of livestock, poultry, fish and shrimp species were observed. No adverse effects were observed in feeding and basic safety studies with leaf protein concentrate in a variety of species.

6.4 Human Safety Studies

6.4.1 Clinical Studies Cited in GRN 742

Sufficient published information is available to demonstrate that duckweed has been, and is currently, used in human food. Pertinent safety data that further support the use of duckweed in food are found in a GRAS Notice (GRN 742, pages 101-105).

As Parabel's LENTEIN™ Complete product contains 30-45% dietary fiber, and specifically 18% cellulose and 2% hemicellulose, respectively, GRN 742 investigated the safety of cellulose and hemicellulose fibers in humans. They found no adverse effects at expected levels of consumption (GRN 742 Pages 103-104). Plantible's LLP product contains not more than 15% dietary fiber; thus, cellulose and hemicellulose levers would also be expected to be lower levels compared to Parabel's LENTEIN™ Complete.

6.4.2 Additional Clinical Studies Post GRN 742

Additional clinical studies were reported after GRN 742 was submitted (Table 12). Zeinstra et al. (2019) fed twelve subjects *L. minor* or peas (equivalent to 20 g of protein) after an overnight fast and measured amino acid, glucose and insulin levels in the blood over a time course up to 180 minutes after consumption. Heart rate, blood pressure and aural temperature were measured before and after consumption. *L. minor* consumption resulted in lower blood amino acids, plasma glucose and insulin levels compared with peas. The authors concluded that these results were due to the lower digestibility and lower glucose content of *L. minor* compared to peas. The values for insulin and glucose response for *L. minor* were within the normal range. There were no significant differences between groups for the assessed health parameters (i.e., heart rate, blood pressure and aural temperature), or the number of gastrointestinal complaints for four days after consumption. No significant adverse events occurred during the study. The authors concluded that a single bolus of *L. minor* grown under controlled conditions did not induce acute adverse effects in humans.

Mes et al. (2022a) conducted a similar study comparing Lemna protein concentrate (LPC) to whey. In a cross-over, double-blind, controlled trial, 12 healthy participants received 20 grams of protein from Lemna protein concentrate (64% protein) and whey protein concentrate (80% protein) in randomized order. Adverse Events were queried by a medical doctor. The Lemna protein concentrate consumption resulted in a significantly lower postprandial increase in almost all individual amino acids. Whey protein intake resulted in a higher insulin increase, accompanied by a stronger reduction in blood glucose levels, compared with Lemna protein. Both proteins produced glucose and insulin responses within the normal range of human variability. The authors concluded that, "Based on these outcomes, and together with the knowledge that duckweed (very often not specified which species of the Lemnoideae family) is eaten for decades in Asian countries, we consider that the LPC in general can be safe for human consumption."

As a follow-up, Mes et al. (2022b) studied the tolerance of healthy adult subjects towards an intake of *Lemna minor* compared to spinach, a more established food product with similar food application characteristics. The study was a randomized controlled parallel trial, in which study subjects daily consumed either *L. minor*- or spinach-based meals for a period of 11 consecutive days. Each meal contained either 170 g fresh weight (FW) *L. minor* or 170 g spinach. All subjects were asked to report daily on gastrointestinal complaints and satiety. Based on these questionnaires, the only differences reported were statistically significant lower hunger and higher flatulence and higher constipation for the *L. minor* group compared to the spinach group. There were no differences between groups in hemoglobin, leukocytes, creatinine, urinary oxalic acid, liver enzymes, markers of iron status, glucose, blood pressure or heart rate. Sensory evaluations were also similar between groups. The authors concluded that consumption of *L. minor* as a cooked vegetable for 11 days did not result in any adverse effects in healthy adults.

Table 12. Human Clinical Studies with *L. Minor* Post GRN 742

Subjects	Dosage and source of test material	Duration	Primary results	Reference
12 healthy men and women	Subjects received two protein sources (peas	Single dose	*L. minor* consumption resulted in lower blood amino	Zeinstra et al., 2019

Subjects	Dosage and source of test material	Duration	Primary results	Reference
	and *L. minor*, equivalent to 20 g protein) in randomized order with a 1-week washout period		acids, plasma glucose and insulin levels compared with peas. There were no significant differences between groups for the assessed health parameters (i.e., heart rate, blood pressure and aural temperature), or the number of gastrointestinal complaints for four days after consumption.	
12 healthy men and women	The study was a cross-over, double-blind, controlled trial in which subjects received 20 grams of Lemna protein concentrate and whey protein concentrate in randomized order	Single dose	The Lemna protein concentrate consumption resulted in a significantly lower postprandial increase in almost all individual amino acids. No adverse events observed.	Mes et al., 2022a
24 healthy adults	Subjects consumed either *L. minor* plant material or spinach as vegetable (170 g fresh weight) as part of a warm meal in a randomized controlled parallel trial design	11 consecutive days of consumption	There were no differences between groups in clinical blood chemistry, blood pressure, heart rate or sensory evaluations. No adverse effects were observed.	Mes et al., 2022b

6.4.3 Human Clinical Studies with "Mankai"

Several human clinical trials have been reported with "Mankai" derived from *Wolffia globosa.* Two studies reported single dose (30 g of protein) or short-term consumption (3 days of 12 g Mankai protein/day); the studies do not report whether adverse effects were collected (Kaplan et al., 2018; Zelicha et al., 2019).

Yaskolla Meir et al. (2021) reported on an 18-month study called DIRECT-PLUS, which was designed to examine the effectiveness of the "green Mediterranean (MED) diet" in combination with restrictions on red/ processed meat and enriched with green plants and polyphenols on non-alcoholic fatty liver disease (NAFLD) as reflected by intrahepatic fat (IHF) loss. There were 294 participants with abdominal obesity/dyslipidaemia enrolled into the study into one of three groups: healthy dietary guidelines (HDG), MED and green-MED weight-loss diet groups, all accompanied by physical activity. Both isocaloric MED groups consumed 28 g/day walnuts (+440mg/day polyphenols provided). The green-MED group further consumed green tea (3–4 cups/day) and Mankai (a *Wolffia globosa* aquatic plant strain; 100 g/ day in frozen cubes) green shake (+1240mg/day total polyphenols provided). The study does not report whether adverse events were collected.

No serious side effects were reported when duckweed was administered as an herbal medicine at daily doses of ~3 g of herb or 1-2 g per day as a powder (Al-Snafi, 2019). Duckweed consumption by astronauts in long-duration space missions, was also the subject of a PhD Thesis in 2020 (McNamara, 2020).

In summary, a body of clinical studies is accumulating that shows consumption up 170 g of fresh duckweed leaf per day on a short-term basis and up to 100 g of duckweed plant per day on a long-term (18-month) basis with no reported adverse effects.

6.4.4 Allergenicity

GRN 742 Page 93-94 discusses the lack of allergenicity concerns with water lentil proteins. In a thorough review (van der Spiegel et al., 2013), the human safety issues associated with popular sources of alternative proteins, including water lentil protein, for use in food were examined. The authors discussed in detail the real possibility of allergenicity issues for several protein sources, but not for water lentils. The absence of discussion of allergenicity for water lentil protein in this review, including in a tabulated summary of the prime safety issues of alternative sources of protein is indicative of the lack of any reports of allergy and suggests no scientific basis for suspicion of any allergic hazard from water lentils' protein. Rubisco, the major protein component of LLP, is known to be rapidly and completely degraded at low pH in the presence of pepsin; potential allergenicity of a protein has been linked with resistance to degradation by proteases, such as pepsin (Wang et al., 2017).

Additionally, GRN 742 included an extensive global literature search on the potential allergenicity of water lentils and water lentil proteins, and no publications were found that indicated that there was an allergenicity issue. Also included in GRN 742, GRAS Associates LLC has sought the opinion of allergen expert Dr. Steven Taylor of the Food Allergy Research and Resource Program of the University of Nebraska. Refer to Appendix I of GRN 742 for details on the expert's conclusions. In summary, consumption of water lentils in Southeast Asia has not been associated with any known occurrence of allergies and there are no scientific publications on the allergenicity of proteins in duckweed. Testing of duckweed protein concentrate for allergenic potential is not feasible because of technical challenges that would be encountered working with a mixture of proteins. For example, there are likely "hundreds of proteins" in duckweed that would need to be individually isolated and sequenced to make comparisons against the amino acid sequences of known allergens. Available testing techniques like ELISA assays are specific to the known allergens and unlikely to identify new allergens unless those novel proteins were highly homologous to a known allergen. Likewise, clinical testing is only practical in cases where cross-reactivity is suspected. However, there are no known allergenic sources botanically related to duckweed. Finally, resistance to digestion in the presence of pepsin is considered a possible indicator of allergenicity, however, interpretation of results would be difficult for a mixture of proteins.

Plantible also sought the opinion of a food allergy expert, Dr. Steve Gendel. Dr. Gendel's review and conclusions are found in Appendix 6. Dr. Gendel reviewed previous regulatory conclusions and the published literature since 2018 and found no new relevant publications that would alter

those conclusions. Consideration was given to the taxonomic and morphological characteristics of *L. minor*, which would not suggest similarity to known food allergens. There are no proteins from species that are related to *L. minor* in databases that contain information on known allergenic proteins. Finally, Lemna protein isolates are available to consumers in the U.S. and other countries, with no reports of adverse effects in the biomedical literature or in the CFSAN Adverse Event Reporting System. In conclusion, there is no available evidence indicating that Lemna Leaf Protein (LLP) from *Lemna minor* presents a significant food allergy risk either for currently food-allergic individuals or for the development of new food allergies.

Plantible will process LLP in a facility that does not process foods containing known allergen sources (i.e., egg, peanut, wheat, etc.).

6.5 Regulatory Status

United States

As discussed throughout this document, the US FDA has issued a "No Objection" letter for Lemanaceae protein isolates. There is a long history of recognized GRAS status for several types of protein preparations, including concentrates and hydrolysates, derived from a wide variety of sources including plants, fungi, fish, poultry, dairy, yeast, pork, and beef. Based on available information from FDA's GRAS notice inventory website as of July 22, 2022, the agency has written dozens of "no questions" letters on GRAS notices on protein preparations, many from plant sources. A number of these are from aquatic sources. Chacon-Lee and Marino (2010) state that microalgae such as spirulina, *Chlorella vulgaris* and *Dunaliella salina*, when properly processed, have been shown to be safe with no known negative effects, based on human studies.

Enriched plant proteins are available commercially in the form of protein concentrates and protein isolates. Enrichment of the raw material results from the extraction of the protein constituents (protein concentrate) or from extract and further subsequent separation (protein isolate)

Canada

Water lentil protein concentrate is also approved in Canada under their Natural Health Products regulations (Appendix 4).

Europe

In 2021 EFSA assessed a traditional food notification regarding the consumption of *W. globosa* and *W. arrhiza* as a fresh vegetable and no safety concerns were raised (EFSA, 2021a).

In 2021, EFSA also delivered an opinion on the safety of water lentil powder as a novel food pursuant to Regulation (EU) 2015/2283 (EFSA, 2021b). This review was based on a submission for novel food authorization by Parabel for LENTEIN™ Complete. EFSA noted that water lentils refer to aquatic plants belonging to the Araceae family and represented by five genera (*Lemna*, *Wolffia*, *Wolffiella*, *Landoltia* and *Spirodela*). The novel food reviewed is thermally washed and

dried water lentils, which are produced as a polyculture crop consisting of species from the *Lemna* genus (70–100%) and the *Wolffia* genus (0–30%). The main constituents of the novel food are protein, fibre and fat. The Panel considers that based on the composition of the novel food and the proposed intended uses, the novel food is not nutritionally disadvantageous, except for concerns regarding intake of manganese from the novel food. Ultimately, because of manganese levels, the safety of the novel food could not be established. For comparison Parabel's five lot analysis showed manganese levels of 128-333 ppm. In contrast, LLP has much lower levels of ~ 11.4 ppm.

In 2021 EFSA also delivered an opinion on the safety of *Wolffia globosa* 'Mankai' powder as a novel food, based on a request submitted by the company Hinoman. *Wolffia globosa* is an aquatic plant, one out of the 38 species of the water lentil family which is composed of five genera (i.e., *Spirodela*, *Landoltia*, *Lemna*, *Wolffiella* and *Wolffia*) (EFSA 2021c). The novel food is produced by cultivation of *Wolffia globosa* plants under controlled conditions, washing with hot water and drying. The main constituents of this novel food are protein, fiber and fat. Again, the Panel determined that the safety could not be established because of manganese levels, which ranged from 59.6-292 in analysis. The company set a manganese specification at <116.5 ppm.

EFSA approved a novel food application by ABC Kroos BV for Water lentil protein concentrate made from *L. minor* and *L. Gibba* in April 2023 (EFSA, 2023). Wageningen University submitted an application for *L. minor* and *L. gibba* as whole plant material as a vegetable. As of August 2023, there is no scientific opinion from EFSA on this applications available through the EFSA Journal.

Australia/New Zealand

Parabel has received feedback from Food Standards Australia New Zealand (FSANZ). In April 2017, the Advisory Committee for Novel Foods concluded that Parabel's LENTEIN Complete, although a non-traditional food in ANZ, is not considered to be a Novel Food under the ANZ Food Standard Codes; hence, the product does not have to undergo a pre-market assessment (Refer to Appendix J). Parabel's LENTEIN™ Complete is considered compliant with the ANZ Food Standards code and therefore can be marketed as a Food Ingredient up to 24 grams per serving in the ANZ region.

6.6 GRAS Determination Summary and Discussion

Based upon a review of the information and data available, Plantible has determined, using scientific procedures, that the amount of Plantible's LLP consumed from the intended uses specified, has been shown to be safe and GRAS.

The intended use of Plantible's LLP, manufactured by Plantible, in foods has been determined through the application of scientific procedures to be safe as described under 21 CFR 170.30 (b) and is supported by the following:

1. Duckweeds, also known as water lentils, have a long history of safe consumption by humans in SE Asia. Duckweed comprises approximately 37 species and the literature has shown considerable similarity in composition across related species. *Lemna minor* is

currently used in consumed foods and dietary supplements in the U.S (https://www.amazon.com/Clean-Green-Protein-Lentein-Sourced/dp/B08JH2JHJW).
EFSA (2021a) has recently assessed a traditional food notification regarding the consumption of *W. globosa* and *W. arrhiza* as a fresh vegetable and no safety concerns were raised.

2. Parabel Ltd determined their LENTEIN™ Complete protein to be GRAS, as described in GRN 742, and the FDA issued a "No Objections" letter regarding this product. The product is very similar to Plantible's LLP; both are purified protein concentrates from controlled hydroponic production of water lentil (whole Lemnaceae). Plantible's LLP contains not less than 80% protein and LENTEIN™ Complete contains up to 50% protein on an 'as is' basis. The essential amino acid content is very similar. The remaining macro-constituents are fat, carbohydrate, ash and dietary fiber. There is no evidence of allergic reactions in humans to duckweed protein. The products are determined to be substantially equivalent; therefore, any reference to the Parabel products also apply to Plantible's LLP. The FDA issued a "No Objections" letter for Parabel's protein concentrate.
3. The major protein in LLP is Rubisco, a ubiquitous protein involved in the Calvin cycle of carbon fixation. Rubisco has a well understood mode of action and a strong history of safe consumption. Rubisco and other minor proteins in LLP are digested like other dietary proteins, by normal metabolic processes. There is no evidence of allergic potential for LLP.
4. The composition of LLP is further supported by a large volume of literature that indicates water lentils have been well characterized and are considered a nontoxic protein source with adequate levels of all amino acids. The protein has a high nutritional quality in that all essential amino acids are present, and the amino acid scoring pattern is similar to that of complete animal proteins.
5. Numerous studies have been conducted to establish the safety and utility of *Lemna minor* and related duckweeds in animal feed. These studies have been conducted over a wide range of dosages in cattle, sheep, swine, poultry, fish, and shrimp with no evidence of adverse effects. While most of these studies did not examine toxicological end points, they do point to the fact that *Lemna minor*/duckweed can be used without adverse effects in animal feed.
6. The estimated consumption from the proposed uses of Plantible's LLP is discussed in Section III. The major interest is to use Plantible's LLP as a protein source in some food products. The proposed use level spans a range of 1 – 20%.
7. No mortality or signs of toxicity were observed in an acute oral toxicity study with Parabel's LENTEIN™ Complete in rats administered by gavage at 2,000 mg/kg bw, the highest dose tested. In addition, under the conditions of the subchronic repeated dose oral toxicity study, the repeated oral administration of Parabel's LENTEIN™ Complete in Wistar rats at the dose level of 1000 mg/kg body weight daily for 90-days showed no observable toxic effects when compared to its corresponding control group of animals. The NOAEL was determined to be 1000 mg/kg, the highest dosage tested. A 90-day rat study designed according to OECD 408 was also conducted with dried Mankai powder from *Wolffia globosa* with a reported NOAEL of 13.16 g/kg/day for males and 15.03 g/kg/day for females.
8. Human clinical studies of consumption of up 170 g of fresh duckweed leaf per day on a short-term basis and up to 100 g of duckweed plant per day on a long-term (18-month) basis have no reported adverse effects.

9. Plantible's LLP is very well characterized and meets high chemical and biological standards. Plantible has reviewed the analytical data for microbial contamination, several key heavy metals and oxalic acid, compared to levels found in common foods. The levels found in Plantible's LLP do not raise concerns of safety. Safe and appropriately low specifications have been proposed by Plantible in Table 2.
10. Plantible has thoroughly reviewed the occurrence of several secondary metabolites that are known to be present in water lentils and the residual levels in water lentil protein concentrations described in GRN 472. The levels of anti-nutritionals and biogenic amines were reported to be significantly lower than other food sources containing oxalic acid, tannins, phytate, trypsin and protease inhibitors and biogenic amines. Given the biological similarity in plants and production environment, these conclusions can be extended to Plantible's LLP and no safety concerns are expected regarding the mentioned anti-nutritionals and secondary metabolites.
11. Plantible employs state-of-the-art, well-controlled manufacturing conditions and GMPs that ensure no contamination is present and eliminate pathogen and pesticide concerns. The water is monitored for heavy metals as well, and specifications have been set for mercury, arsenic, cadmium and lead. Plantible's LLP will be manufactured under cGMP to meet SQF level 2 Category 19 and 21 CFR 117 Manufacture Standards for GMP, Hazard Analysis and Risk-based Preventive Controls and food additive regulations established by the U.S. Food and Drug Administration (FDA) and the product specifications for food grade are consistent with current state-of-the-art requirements.

6.7 GRAS Conclusion

Plantible has critically evaluated the published and unpublished data and information summarized in this safety evaluation, and concludes that Plantible's LLP - which is produced in accordance with FDA Good Manufacturing Practices requirements and which meets the appropriate food-grade product specifications as set forth in Section II.E.2 of the provided safety evaluation and as required by FDA regulation, 21 CFR 182.1 (b)(l) - is considered to be Generally Recognized As Safe when consumed as a nutritional ingredient in a variety of food categories that include beverages and beverage bases, breakfast cereals, frozen dairy desserts and mixes, grain products and pastas, milk products, plant protein products, processed fruits and fruit juices, snack foods, soft candy, soups and soup mixes, and salad dressings at a level of use consistent with current good manufacturing practices resulting in 1-20% inclusion.

This declaration is made in accordance with FDA's standard for food ingredient safety, i.e., reasonable certainty of no harm under the intended conditions of use.

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Part 7: List of supporting data and information

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Appendix 1. Certificates of Analysis for Plantible's Lemna Leaf Protein Five Batch Analysis

Certified Laboratories the Midwest

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Certificate of Analysis

REPORT #: 959139
PROJECT ID: MWCR14097-2206-001-S
REPORT DATE: 6/16/22
PRINT DATE: 6/16/22

PLANTIBLE FOODS
2600 SARVER LANE
SAN MARCOS, CA 92069
ATT: TONY MARTENS

PROJECT TITLE: SHELF LIFE DETERMINATION OF A GRAS PRODUCT

LAB #: 3423960
PRODUCT: GRAS - REP 1
LOT/BATCH #: P022822C1

DATE RECEIVED:6/2/22

ANALYTE	RESULT	UNITS	METHOD REFERENCE
AEROBIC PLATE COUNT	840	CFU/g	APHA CMMEF CHP 8
COLIFORM	<10	CFU/g	AOAC 991.14
E.COLI	<10	CFU/g	AOAC 991.14
LISTERIA MONOCYTOGENES	NEGATIVE	/25g	AOAC 2004.02
SALMONELLA	NEGATIVE	/25g	AOAC 2011.03
MOLD	20	CFU/g	APHA CMMEF CHP 21
YEAST	<10	CFU/g	APHA CMMEF CHP 21
TOTAL ASH	2.99	%	AOAC
FFA AS OLEIC ACID	19.80	% ON FAT BASIS	AOAC 940.28
VACUUM DRYING MOISTURE	8.03	%	AOAC
PROTEIN	81.56	%	AOAC
TOTAL DIETARY FIBER	10.0	%	AOAC 991.43
METALS BY ICP-MS			FDA EAM 4.7
ARSENIC	212	ppb	
CADMIUM	24.3	ppb	
MERCURY	35.0	ppb	
LEAD	58.6	ppb	
ORGANIC ACID PROFILE			HPLC
OXALIC ACID	0.019	%	

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REPORT DATE: 6/16/22
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PLANTIBLE FOODS
2600 SARVER LANE
SAN MARCOS, CA 92069
ATT: TONY MARTENS

PROJECT TITLE: SHELF LIFE DETERMINATION OF A GRAS PRODUCT

LAB #: 3423961
PRODUCT: GRAS - REP 2
LOT/BATCH #: P031522C1

DATE RECEIVED:6/2/22

ANALYTE	RESULT	UNITS	METHOD REFERENCE
AEROBIC PLATE COUNT	90	CFU/g	APHA CMMEF CHP 8
COLIFORM	<10	CFU/g	AOAC 991.14
E.COLI	<10	CFU/g	AOAC 991.14
LISTERIA MONOCYTOGENES	NEGATIVE	/25g	AOAC 2004.02
SALMONELLA	NEGATIVE	/25g	AOAC 2011.03
MOLD	<10	CFU/g	APHA CMMEF CHP 21
YEAST	<10	CFU/g	APHA CMMEF CHP 21
TOTAL ASH	3.21	%	AOAC
FFA AS OLEIC ACID	19.43	% ON FAT BASIS	AOAC 940.28
VACUUM DRYING MOISTURE	7.16	%	AOAC
PROTEIN	82.56	%	AOAC
TOTAL DIETARY FIBER	8.6	%	AOAC 991.43
METALS BY ICP-MS			FDA EAM 4.7
ARSENIC	206	ppb	
CADMIUM	23.3	ppb	
MERCURY	35.4	ppb	
LEAD	48.5	ppb	
ORGANIC ACID PROFILE			HPLC
OXALIC ACID	0.018	%	

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PLANTIBLE FOODS
2600 SARVER LANE
SAN MARCOS, CA 92069
ATT: TONY MARTENS

PROJECT TITLE: SHELF LIFE DETERMINATION OF A GRAS PRODUCT

LAB #: 3423962
PRODUCT: GRAS - REP 3
LOT/BATCH #: P011022C1

DATE RECEIVED:6/2/22

ANALYTE	RESULT	UNITS	METHOD REFERENCE
AEROBIC PLATE COUNT	150	CFU/g	APHA CMMEF CHP 8
COLIFORM	<10	CFU/g	AOAC 991.14
E.COLI	<10	CFU/g	AOAC 991.14
LISTERIA MONOCYTOGENES	NEGATIVE	/25g	AOAC 2004.02
SALMONELLA	NEGATIVE	/25g	AOAC 2011.03
MOLD	<10	CFU/g	APHA CMMEF CHP 21
YEAST	<10	CFU/g	APHA CMMEF CHP 21
TOTAL ASH	3.28	%	AOAC
FFA AS OLEIC ACID	21.84	% ON FAT BASIS	AOAC 940.28
VACUUM DRYING MOISTURE	7.01	%	AOAC
PROTEIN	82.53	%	AOAC
TOTAL DIETARY FIBER	7.5	%	AOAC 991.43
METALS BY ICP-MS			FDA EAM 4.7
ARSENIC	213	ppb	
CADMIUM	20.3	ppb	
MERCURY	36.8	ppb	
LEAD	51.6	ppb	
ORGANIC ACID PROFILE			HPLC
OXALIC ACID	0.016	%	

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Certificate of Analysis

REPORT #: 959139
PROJECT ID: MWCR14097-2206-001-S
REPORT DATE: 6/16/22
PRINT DATE: 6/16/22

PLANTIBLE FOODS
2600 SARVER LANE
SAN MARCOS, CA 92069
ATT: TONY MARTENS

PROJECT TITLE: SHELF LIFE DETERMINATION OF A GRAS PRODUCT

LAB #: 3423963
PRODUCT: GRAS - REP 4
LOT/BATCH #: P030122C1

DATE RECEIVED:6/2/22

ANALYTE	RESULT	UNITS	METHOD REFERENCE
AEROBIC PLATE COUNT	22,000	CFU/g	APHA CMMEF CHP 8
COLIFORM	<10	CFU/g	AOAC 991.14
E.COLI	<10	CFU/g	AOAC 991.14
LISTERIA MONOCYTOGENES	NEGATIVE	/25g	AOAC 2004.02
SALMONELLA	NEGATIVE	/25g	AOAC 2011.03
MOLD	<10	CFU/g	APHA CMMEF CHP 21
YEAST	<10	CFU/g	APHA CMMEF CHP 21
TOTAL ASH	3.22	%	AOAC
FFA AS OLEIC ACID	17.49	% ON FAT BASIS	AOAC 940.28
VACUUM DRYING MOISTURE	8.92	%	AOAC
PROTEIN	80.85	%	AOAC
TOTAL DIETARY FIBER	9.5	%	AOAC 991.43
METALS BY ICP-MS			FDA EAM 4.7
ARSENIC	199	ppb	
CADMIUM	32.6	ppb	
MERCURY	28.7	ppb	
LEAD	53.8	ppb	
ORGANIC ACID PROFILE			HPLC
OXALIC ACID	0.013	%	

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Certificate of Analysis

REPORT #: 959139
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REPORT DATE: 6/16/22
PRINT DATE: 6/16/22

PLANTIBLE FOODS
2600 SARVER LANE
SAN MARCOS, CA 92069
ATT: TONY MARTENS

PROJECT TITLE:SHELF LIFE DETERMINATION OF A GRAS PRODUCT

LAB #: 3423964
PRODUCT: GRAS - REP 5
LOT/BATCH #: P012222C1

DATE RECEIVED:6/2/22

ANALYTE	RESULT	UNITS	METHOD REFERENCE
AEROBIC PLATE COUNT	370	CFU/g	APHA CMMEF CHP 8
COLIFORM	<10	CFU/g	AOAC 991.14
E.COLI	<10	CFU/g	AOAC 991.14
LISTERIA MONOCYTOGENES	NEGATIVE	/25g	AOAC 2004.02
SALMONELLA	NEGATIVE	/25g	AOAC 2011.03
MOLD	60	CFU/g	APHA CMMEF CHP 21
YEAST	<10	CFU/g	APHA CMMEF CHP 21
TOTAL ASH	3.04	%	AOAC
FFA AS OLEIC ACID	15.67	% ON FAT BASIS	AOAC 940.28
VACUUM DRYING MOISTURE	7.31	%	AOAC
PROTEIN	81.74	%	AOAC
TOTAL DIETARY FIBER	9.7	%	AOAC 991.43
METALS BY ICP-MS			FDA EAM 4.7
ARSENIC	201	ppb	
CADMIUM	21.7	ppb	
MERCURY	38.6	ppb	
LEAD	62.0	ppb	
ORGANIC ACID PROFILE			HPLC
OXALIC ACID	0.018	%	

Benjamin Howard
Laboratory Director

END OF REPORT

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Standard Limits of Quantification of Tests Conducted by Certified Laboratories the Midwest

Communicated by Peter Yi, October 10, 2022

Analyte	Limit of Quantification
APC	<10 CFU/g*
Coliforms	<10 CFU/g*
E.coli	<10 CFU/g*
Mold	<10 CFU/g*
Yeast	<10 CFU/g*
Metals ICP-MS	<10 ppb*

***Based on Standard Default Dilutions**

Appendix 2. Representative Certificate of Analysis for Nutritional and Compositional Components

FSNS Food Safety Net Services

Analytical Results

Report Number: 22-270984
Report Date: 06/13/2022

6281 Chalet Dr, Commerce, CA, 90040 Phone:562-806-2143 Fax:562-927-7958

Customer*: Plantible Foods
Contact*: Allison Stapleford
2600 Sarver Lane
San Marcos, CA, 92069
Phone*: 907-444-5192
Fax*:

Samples Received: 05/26/2022
Start of Testing: 05/31/2022
PO Number:

Billing Code	Sample Date*	Sample Number	Sample Description*	Analysis - FSNS Method Number	Result	Units
FAT02	05/25/2022	001	P033122-P1 PROTEIN POWDER Composite: None	Fat, Acid Hydrolysis - Mojonnier (AOAC)	0.35	%
HMS28	05/25/2022	001		Heavy Metal Screen 4 - ICPMS: As, Cd, Hg, Pb C#1555	Complete	
ICP-CA	05/25/2022	001		Calcium by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	60.60	mg/100g
ICP-FE	05/25/2022	001		Iron by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	58.90	mg/100g
ICP-MN	05/25/2022	001		Manganese by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	12400.00	ppb
ICP-P	05/25/2022	001		Phosphorus by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	566.00	mg/100g
ICP-K	05/25/2022	001		Potassium by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	1640.00	mg/100g
ICP-NA	05/25/2022	001		Sodium by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	285.00	mg/100g
NPN01	05/25/2022	001		Non-Protein Nitrogen (NPN)	1.13	%
PRO01	05/25/2022	001		Percent Protein- Kjeldahl #C1503	80.15	%
SPEPRO	05/25/2022	001		Special Chemistry Project Test Note: Total Ash: 4.17% STARCH <0.1 % INSOLUBLE DIETARY FIBER (IDF) 4.3 % SOLUBLE DIETARY FIBER (SDF) 8.2 % TOTAL DIETARY FIBER (TDF) 12.5 %	Complete	
VACMOI	05/25/2022	001		Vacuum Moisture #C02.2	4.71	%
VIT-B12	05/25/2022	001		Vitamin B12 - Cyanocobalamin	16.76 mcg / 100g	
NC	05/25/2022	001		Arsenic (ICP-MS) #C55	65.600	ppb
NC	05/25/2022	001		Cadmium (ICP-MS) #C55	21.300	ppb

Customer : Plantible Foods Report Number : 22-270984 Report Date : 06/13/2022

Billing Code	Sample Date*	Sample Number	Sample Description*	Analysis - FSNS Method Number	Result	Units
NC	05/25/2022	001		Mercury (ICP-MS) #C55	<10.000	ppb
NC	05/25/2022	001		Lead (ICP-MS) #C55	314.000	ppb
NC	05/25/2022	001		Protein Factor	6.25	

Sample Temperature Upon Receipt: 19.3 deg C

Remarks:

All results contained in the above report relate only to the items tested. All samples received in satisfactory condition unless noted otherwise. *The indicated information has been provided by the client to FSNS.

For Questions or Comments Contact:
Jennifer Birch
562-806-2143 or Jennifer.Birch@fsns.com

First Approval By: **John Estrada**

Signature:

Second Approval By: **Elise Calnin**

Signature:

FSNS
Food Safety Net Services

Analytical Results

Report Number: 22-327767
Report Date: 07/05/2022

6281 Chalet Dr, Commerce, CA, 90040 Phone:562-806-2143 Fax:562-927-7958

Customer*: Plantible Foods
Contact*: Allison Stapleford
2600 Sarver Lane

San Marcos, CA, 92069
Phone*: 907-444-5192
Fax*:

Samples Received: 06/27/2022
Start of Testing: 06/27/2022
PO Number:

Billing Code	Sample Date*	Sample Number	Sample Description*	Analysis - FSNS Method Number	Result	Units
			P062322-P1 PROTEIN POWDER Composite: None			
ICP-MN	06/24/2022	001		Manganese by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	0.82	mg/100g
			P062122-P1 PROTEIN POWDER Composite: None			
ICP-MN	06/24/2022	002		Manganese by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	1.13	mg/100g
ICPMS-PB	06/24/2022	003	P030822-P1	Lead (ICP-MS) C#1555	368.0000	ppb

Customer : Plantible Foods | Report Number : 22-327767 | Report Date : 07/05/2022

Billing Code	Sample Date*	Sample Number	Sample Description*	Analysis - FSNS Method Number	Result	Units
			Composite: None			
ICP-Ca	06/24/2022	003		Calcium by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	89.70	mg/100g
ICP-MN	06/24/2022	003		Manganese by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	1.38	mg/100g
ICP-K	06/24/2022	003		Potassium by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	1610.00	mg/100g
ICP-NA	06/24/2022	003		Sodium by ICP-OES #C1526 (AOAC 985.01M/2011.14M)	231.00	mg/100g

Sample Temperature Upon Receipt: 23.2 deg C

Remarks:

All results contained in the above report relate only to the items tested. All samples received in satisfactory condition unless noted otherwise. *The indicated information has been provided by the client to FSNS.

For Questions or Comments Contact:
Jennifer Birch
562-806-2143 or Jennifer.Birch@fsns.com

First Approval By: **Crystal Leem**

Signature:

Second Approval By: **John Estrada**

Signature:

Appendix 3. Dietary Intake Assessment for LLP

Regulatory Connections, LLC

Estimated Daily Intake of Lemma Leaf Protein

Prepared for Plantible Foods

August 23 2023

Bridging Compliance from Concept to Consumer

Contents

Executive Summary

Regulatory Connections, LLC has conducted an intake assessment to estimate the mean and 90th percentile daily intake of the ingredient Lemma Leaf Protein based on its intended use in foods. This assessment included the proposed food categories for the use of Lemma Leaf Protein in baked goods, beverages, breakfast cereals, frozen dairy desserts, milk substitutes, pasta, puddings, plant protein products, salad dressings, snack foods, soft candy and confections (candy), and soups and soup mixes. In mixed dishes, Lemma Leaf Protein was assumed to be present only in a component of the food; therefore, the proportion of the Lemma Leaf Protein in these foods was calculated using the Food and Nutrient Database for Dietary Studies (FNDDS).

Using the dietary survey data from the National Health and Nutrition Examination Survey (NHANES 2017-2022 pre-pandemic), the total estimated daily intake (EDI) of the Lemma Leaf Protein was calculated. The *per user* mean and 90th percentile EDIs of the Lemma Leaf Protein for the US population 2 years and over were determined to be 31.4 and 61.1 g/day (0.55 and 1.16 g/kg bw/day), respectively. The *per capita* mean and 90th percentile EDI of Lemma Leaf Protein for the US population 2 years and older were determined to be 31.3 and 69.5 g/day (0.50 and 1.03 g/kg bw/day), respectively.

Data

To calculate the EDI of the Lemma Leaf Protein, information about its proposed uses in foods was combined with up-to-date, publicly available dietary intake survey data. Data sources are described in the following sections.

1. Proposed Uses and Use Levels of Lemma Leaf Protein

Plantible Foods proposes to use Lemma Leaf Protein in various food categories according to Table 1.

Table 1. Proposed Uses and Use Levels of Lemma Leaf Protein

Food Category		Usage, %
Baked goods and Baking mixes	Cakes	1 - 10
	Cookies	1 - 10
	Crackers	1 - 10
	Crouton	1 - 10
	Grain based bars	1 - 10
	Bread and similar products	1 - 10
	Fine bakery, e.g. croissants, scones	1 - 10
	Doughs and similar products	1 - 10
Beverages	Functional drinks; sports and ready to drink beverages	4.1
	Non-alcoholic, including soft drinks, coffee substitutes, and fruit- and vegetable- flavored gelatin drinks]	4.1
	Ingredients for coffee, cocoa, tea, and herbal infusions	4.1
	Beverage concentrates, powdered nutritional beverage	4.1
Breakfast Cereals	Museli and similar breakfast cereals	1 - 10
	Breakfast cereals	1 - 10
	Cereals and cereal primary derivatives	1 - 10
Frozen Dairy Desserts	Frozen dairy desserts and mixes	1 - 5
	Spoonable desserts and ice cream	1 - 5
Grain Products	Pasta	1 - 10
Milk Products	Milk drink products (specifically milk substitutes)	6.25
	Spreads, dips, cream substitutes	1 - 10
Plant Protein Products	NAS reconstituted vegetable protein	1 - 20
	Meat imitates	1 - 20
	Dairy imitates	1 - 20
	Seafood imitates	1 - 20
	Poultry imitates	1 - 20
	Egg imitates	1 - 20
	Protein based nutritional bars	1 - 20
Processed Fruit and Fruit Juices	Commercially processed fruits, citrus, berries, and mixed fruits	5
	Fruit/vegetable juices and nectars	6.25
Snack Foods	Snacks	1 - 10
Soft Candy and Confections	Desserts and mousses	5
	Confections (including chocolate confections)	1 - 10

	Coatings, fillings, dessert sauces/toppings	1 - 10
Soups and Soup Mixes	Soups and Soup Mixes	5
Other	Salad dressings	5
	Savory extracts and sauce ingredients	5

2. Dietary Survey Data

Dietary survey data was obtained from What We Eat in America (WWEIA), the dietary interview portion of the NHANES database. NHANES is carried out by the Centers for Disease Control and Prevention (CDC), to characterize the general health and nutritional status of children and adults across the US. The dietary intake survey portion of NHANES is a joint effort between CDC and the US Department of Agriculture (USDA). The NHANES dietary intake data for 2017-2020 pre-pandemic was included in the present analysis.

WWEIA consists of two 24-hour dietary recall interviews. The first day of the WWEIA dietary questionnaire was administered in person, in conjunction with the participants' interviews and examinations for the other NHANES lifestyle and laboratory assessments. The second day of the survey was collected via a phone interview at some point 3–10 days after the first survey day. Respondents who provided complete records for both days were designated "reliable" by WWEIA.

NHANES also collects demographic and anthropometric information for each respondent, including age, sex, and body weight. These data can be linked to the WWEIA dietary intake data using a unique (but anonymous) ID number assigned to each NHANES respondent. Some respondents may be missing some information. To calculate intake on a per-kg-body-weight basis, only the "reliable" WWEIA respondents who also provided body-weight information are considered in the analysis.

Data collected during the dietary interview include a list of foods consumed by the participant, each encoded by a numerical "food code," and the amount of each food that was eaten at each meal, in grams.

Plantible Foods was provided a "Food Use Workbook" to aid in determining the appropriate WWEIN Categories and Food Codes. The results of this prework is found in Appendix A.

3. Proportion of Ingredients in Foods

Food codes were included in each of the use categories in Table 1 if they are expected to contain any proportion of the ingredient in that use category. For example, food code 42301015, "Peanut butter sandwich, with regular peanut butter, on white bread," was included in the use category "Baked Goods" because the "bread" component of this food code was part of this use category. However, WWEIA does not separately record the amounts consumed of individual food components; it only records the amount consumed of the whole food "as eaten." The amounts of the separate components, peanut butter and bread, are not broken out. Therefore, when Lemma Leaf Protein is to be added only to one

component of a food, it is necessary to estimate the relevant proportion of that component in the food. In the peanut butter sandwich example, the 10% use level in the "Baked Goods" category should not be applied to the total grams of food code 42301015 consumed; it should be applied only to the portion of that food code that is composed of bread.

The proportion of the relevant component in each food code was obtained using the FNDDS Databases from 2019-2020. FNDDS provides nutrient profiles, associated portions, and recipe calculations for foods and beverages specified in each WWEIA NHANES survey year. Recipes specify ingredients and their amounts, which were determined by USDA based on food-label data from USDA's Branded Food Products Database, company websites, product preparation instructions, label ingredients, cookbooks, and recipe websites. An example of an FNDDS recipe generated for WWEIA food code 42301015 (the peanut butter sandwich) is shown in Table 2.

"Food code" is the eight-digit WWEIA food code.
"Seq num" is a number denoting the order of the ingredients within a food code
"Ingredient code" is a unique numerical code identifying the ingredient.
"Ingredient description" describes each ingredient in words.
"Ingredient fraction" is the proportion of each ingredient in one standard portion of the food code

Table 2. Example of FNDDS Recipe WWEIA Food Code 42301015

Food code	Main food description	WWEIA Category number	WWEIA Category description	Seq Num	Ingredient code	Ingredient description	Ingredient Fraction
42301015	Peanut butter sandwich, with regular peanut butter, on white bread	3722	Peanut butter and jelly sandwiches	1	16098	Peanut butter, smooth style, with salt	0.347826087
42301015	Peanut butter sandwich, with regular peanut butter, on white bread	3722	Peanut butter and jelly sandwiches	2	18069	Bread, white, commercially prepared	0.652173913

Methods

To estimate the intake of Lemma Leaf Protein from its proposed uses, the following steps were performed:

- Step 1: Identify WWEIA foods to which Lemma Leaf Protein may be applied
- Step 2: Identify and eliminate Food Codes which are not applicable to Lemma Leaf Protein intended use
- Step 3: Identify Food Codes which include only a proportion of Lemma Leaf Protein intended use
- Step 4: Search FNDDS database recipes for determination of ingredient fraction
- Step 5: Analyze intake of Lemma Leaf Protein for individual NHANES respondents, using DaDiet Software[1]
- Step 6: Generate an estimated daily intake (EDI) report for per capita and "users", stratified by age and gender

[1] DaDiet Software is a web-based software tool that allows accurate estimation of exposure to nutrients and to substances added to foods, including contaminants, food additives and novel ingredients. The main input components are concentration (use level) data and food consumption data. Data sets are combined in the software to provide accurate and efficient exposure assessments.

Results

Figure 1 presents the top food category contributors to the mean intake

Tables 3 and 4, below, present the EDIs for Lemma Leaf Protein in g/day and g/kg bw/per day, respectively. The daily intake of tigernuts under the conditions of intended use are estimated on an "All Person" (i.e. per capita) and "All User" consumption basis. At the mean and 90th percentile intake. In this analysis "all person" estimates refer to the consumption based on the entire population of interest, whereas a "user" is anyone who reported consuming the food category of interest on either of the survey days. If the food is commonly consumed, the "eaters" intake will be comparable to the per capita intake.

The *per user* mean and 90th percentile EDIs of the Lemma Leaf Protein for the US population 2 years and over were determined to be 31.4 and 61.1 g/day (0.55 and 1.16 g/kg bw/day), respectively. The *per capita* mean and 90th percentile EDI of Lemma Leaf Protein for the US population 2 years and older were determined to be 31.3 and 69.5 g/day (0.50 and 1.03 g/kg bw/day), respectively.

Figure 1. Top Contributors to Mean Lemma Leaf Protein Intake.

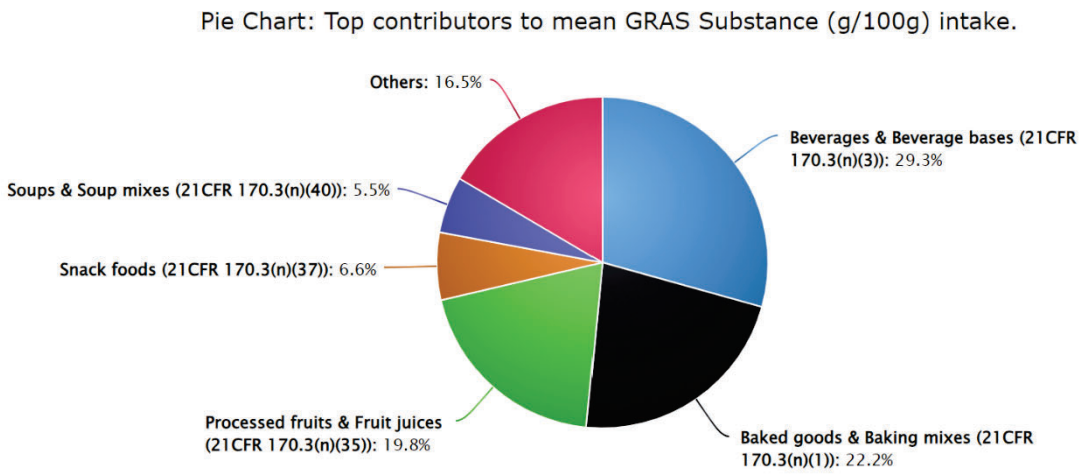

Table 3. Estimated Daily Intake of Lemma Leaf Protein (g/day)

Ages (Years)	Sex	% Population	Actual # Population	All Person Consumption (g/day)		% Users	Actual # Total Users	All Users Consumption (g/day)	
				Mean	90th Percentile			Mean	90th Percentile
0-1	Both	100.0	Not applicable - intended use does not include infants						
	Female	100.0							
	Male	100.0							
1-5	Both	100.0	1052	22.788	41.558	99.8	1050	22.838	41.558
	Female	100.0	502	21.59	39.014	99.6	501	21.687	39.014
	Male	100.0	550	23.86	44.394	100.0	549	23.863	44.394
6-12	Both	100.0	1381	31.354	52.301	99.9	1380	31.376	52.301
	Female	100.0	678	30.548	49.982	99.8	677	30.594	49.982
	Male	100.0	703	32.065	55.76	100.0	703	32.065	55.76
13-19	Both	100.0	1294	33.686	62.048	99.7	1287	33.792	62.118
	Female	100.0	648	29.903	55.041	99.9	646	29.947	55.069
	Male	100.0	646	37.476	67.351	99.5	641	37.658	67.351
19+	Both	100.0	6799	31.522	62.812	99.1	6727	31.808	62.963
	Female	100.0	3549	26.088	51.035	99.1	3516	26.336	51.251
	Male	100.0	3250	31.522	74.035	99.1	3211	37.743	74.304
2+	Both	100.0	10116	31.304	69.48	99.3	10038	31.534	61.105
	Female	100.0	5198	26.605	50.522	99.2	5162	26.81	50.785
	Male	100.0	4918	36.248	60.883	99.3	4876	36.5	69.485

Table 4. Estimated Daily Intake of Lemma Leaf Protein (g/kg bw/day)

Ages (Years)	Sex	% Population	Actual # Population	All Person Consumption (g/kg bw/day)		% Users	Actual # Total Users	All Users Consumption (g/kg bw/day)	
				Mean	90th Percentile			Mean	90th Percentile
0-1	Both	100.0							
	Female	100.0			Not applicable - intended use does not include infants				
	Male	100.0							
1-5	Both	100.0	1032	1.44	2.575	99.8	1030	1.443	2.68
	Female	100.0	497	1.391	2.432	99.5	496	1.398	2.432
	Male	100.0	535	1.484	2.68	100.0	534	1.484	2.575
6-12	Both	100.0	1373	0.909	1.724	99.9	1372	0.91	1.725
	Female	100.0	675	0.868	1.616	99.8	674	0.869	1.623
	Male	100.0	698	0.945	1.832	100.0	698	0.945	1.832
13-19	Both	100.0	1278	0.519	0.975	99.7	1272	0.521	0.975
	Female	100.0	638	0.483	0.95	99.9	636	0.483	0.95
	Male	100.0	640	0.556	1.1	99.5	636	0.558	1.1
19+	Both	100.0	6731	0.389	0.765	99.1	6660	0.392	0.765
	Female	100.0	3509	0.352	0.681	99.0	3476	0.355	0.683
	Male	100.0	3222	0.429	0.84	99.1	3184	0.433	0.844
2+	Both	100.0	10015	0.5	1.032	99.3	9938	0.503	1.037
	Female	100.0	5148	0.456	0.926	99.2	5112	0.459	0.931
	Male	100.0	4867	0.546	1.032	99.3	4826	0.55	1.171

Appendix A: WWEIA Categories & Food Code Prework

Food Category		Usage, %	Comments
Baked goods and Baking mixes	Cakes	1 - 10	WWEIA 5502 not include pies; not cobblers; not crisps; not turnovers
	Cookies	1 - 10	WWEIA 5504 not include brownies; not include graham cracker cookies
	Crouton	1 - 10	Not a WWEIA Category, will need to search by Food Code
	Bread and similar products	1 - 10	WWEIA 4202, 4204; fractionate sandwiches
	Fine bakery, e.g. croissants, scones	1 - 10	Not a WWEIA Category, will need to search by Food Code
	Doughs and similar products	1 - 10	Not a WWEIA Category, will need to search by Food Code
Beverages	Functional drinks; sports and ready to drink beverages	4.1	WWEIA 7104; WWEIA 7206
	Non-alcoholic, including soft drinks, coffee substitutes, and fruit- and vegetable- flavored gelatin drinks]	4.1	WWEIA 7102; WWEIA 7202
	Ingredients for coffee, cocoa, tea, and herbal infusions	4.1	Not WWEIA 7302 (coffee); Not WWEIA 7304 (tea); No WWEIA for herbal - will need to search by Food Code
	Beverage concentrates, powdered nutritional beverage	4.1	WWEIA 9802; Search beverage concentrates by Food Code
Breakfast Cereals	Museli and similar breakfast cereals	1 - 10	WWEIA 4602; WWEIA 4604; WWEIA 4804; WWEIA 5402; Not baby cereals
	Breakfast cereals	1 - 10	Ditto
	Cereals and cereal primary derivatives	1 - 10	Ditto
	Grain based bars	1 - 10	WWEIA 5402 which is in FDA cereal category; WWEIA 5404 Nutrition bar which is considered a snack
Cheeses	Spreads, dips, cream substitutes	1 - 10	Subdivide WWEIA 8412 for dips & spreads made with cheese; will need to search dips by Food Code
Frozen Dairy Desserts	Frozen dairy desserts and mixes	1 - 5	WWEIA 5802
	Spoonable desserts and ice cream	1 - 5	Ditto
Grain Products	Pasta	1 - 10	WWEIA 4004; Fractionate WWEIA 3204; Ask client if macaroni included
Milk Products	Milk drink products	6.25	not WWEIA 1402 (not includes shakes); Not milk; Not flavored milk; WWEIA 1404 includes milk substitutes; plant based milks
	Spreads, dips, cream substitutes	1 - 10	Subdivide WWEIA 8412; will need to search dips by Food Code
Plant Protein Products	NAS reconstituted vegetable protein	1 - 20	Not a WWEIA Category, will need to search by Food Code; fractionate substitutes?
	Meat imitates	1 - 20	Not a WWEIA Category, will need to search by Food Code; fractionate substitutes?
	Dairy imitates	1 - 20	Not a WWEIA Category, will need to search by Food Code; fractionate substitutes?
	Seafood imitates	1 - 20	Not a WWEIA Category, will need to search by Food Code; fractionate substitutes?

	Poultry imitates	1 - 20	Not a WWEIA Category, will need to search by Food Code; fractionate substitutes?
	Egg imitates	1 - 20	Not a WWEIA Category, will need to search by Food Code; fractionate substitutes?
	Protein based nutritional bars	1 - 20	WWEIA 5404 (remove duplicates from grain based bars); Nutrition bars considered as a snack
Processed Fruit and Fruit Juices	Commercially processed fruits, citrus, berries, and mixed fruits	5	WWEIA 6012; Not dried fruit; Not fruit salad;
	Fruit/vegetable juices and nectars	6.25	WWEIA 7006; WWEIA 7204; WWEIA 7002; WWEIA 7004; WWEIA 7008; not baby food
Snack Foods	Snacks	1 - 10	WWEIA 5008 (pretzels); Not baby snacks; WWEIA 5002 (chips); WWEIA 5004 (chips); WWEIA 5006 (popcorn)
	Crackers	1 - 10	WWEIA 5202; Ask client about WWEIA 5204 Saltines; Note "Crackers" are considered FDA snack
	Grain based bars	1 - 10	WWEIA 5402 which is in FDA cereal category; WWEIA 5404 Nutrition bar which is considered a snack
Soft Candy and Confections	Desserts and mousses	5	Not a WWEIA Category, will need to search by Food Code
	Confections (including chocolate confections)	1 - 10	WWEIA 5702; Ask client if non-chocolate candy
	Coatings, fillings, dessert sauces/toppings	1 - 10	Not a WWEIA Category (WWEIA 8806), will need to search by Food Code
Soups and Soup Mixes	Soups and Soup Mixes	5	WWEIA 3802 (not include home recipe unless canned)
Other	Salad dressings	5	Subdivide WWEIA 8012; dressings are in Fats and Oils
	Savory extracts and sauce ingredients	5	Subdivide WWEIA 8412; Ask client if pasta sauces included

Appendix B: List of Food Codes and Calculated Proportions

Food Code	Main Food Description	GRAS Food Group	GRAS Substance (g/100g)	Ingredient Fraction	Concentration in Substance
11300100	Non-dairy milk, NFS	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11320000	Soy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11320100	Soy milk, light	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11320200	Soy milk, nonfat	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11321000	Soy milk, chocolate	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11321100	Soy milk, light, chocolate	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11321200	Soy milk, nonfat, chocolate	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11350000	Almond milk, sweetened	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11350010	Almond milk, sweetened, chocolate	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11350020	Almond milk, unsweetened	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11350030	Almond milk, unsweetened, chocolate	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11360000	Rice milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11370000	Coconut milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11440010	Chipotle dip, yogurt based	Milk products (21CFR 170.3(n)(31))	10	1	10
11440020	Dill dip, yogurt based	Milk products (21CFR 170.3(n)(31))	10	1	10
11440030	Onion dip, yogurt based	Milk products (21CFR 170.3(n)(31))	10	1	10
11440040	Ranch dip, yogurt based	Milk products (21CFR 170.3(n)(31))	10	1	10
11440050	Spinach dip, yogurt based	Milk products (21CFR 170.3(n)(31))	10	1	10
11440060	Tzatziki dip	Milk products (21CFR 170.3(n)(31))	10	1	10
11440070	Vegetable dip, yogurt based	Milk products (21CFR 170.3(n)(31))	10	1	10
11459990	Frozen yogurt, NFS	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11460000	Frozen yogurt, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5

11460100	Frozen yogurt, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11460500	Frozen yogurt, soft serve, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11460510	Frozen yogurt, soft serve, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461200	Frozen yogurt sandwich	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461210	Frozen yogurt bar, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461220	Frozen yogurt bar, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461250	Frozen yogurt cone, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461260	Frozen yogurt cone, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461300	Frozen yogurt cone, vanilla, waffle cone	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11461320	Frozen yogurt cone, chocolate, waffle cone	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
11512030	Hot chocolate / Cocoa, ready to drink, made with non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11512120	Hot chocolate / Cocoa, ready to drink, made with non-dairy milk and whipped cream	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11513310	Chocolate milk, made from dry mix with non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11513375	Chocolate milk, made from reduced sugar mix with non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11513385	Chocolate milk, made from dry mix with non-dairy milk (Nesquik)	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11513395	Chocolate milk, made from no sugar added dry mix with non-dairy milk (Nesquik)	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25

11513750	Chocolate milk, made from syrup with non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11513805	Chocolate milk, made from light syrup with non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11513855	Chocolate milk, made from sugar free syrup with non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11514150	Hot chocolate / Cocoa, made with dry mix and non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11514360	Hot chocolate / Cocoa, made with no sugar added dry mix and non-dairy milk	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
11519215	Strawberry milk, non-dairy	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
12320100	Sour cream, imitation	Cheeses (21CFR 170.3(n)(5))	20	1	20
12350010	Dip, NFS	Milk products (21CFR 170.3(n)(31))	10	1	10
12350200	Chipotle dip, regular	Milk products (21CFR 170.3(n)(31))	10	1	10
12350205	Chipotle dip, light	Milk products (21CFR 170.3(n)(31))	10	1	10
12350210	Dill dip, regular	Milk products (21CFR 170.3(n)(31))	10	1	10
12350215	Dill dip, light	Milk products (21CFR 170.3(n)(31))	10	1	10
12350220	Onion dip, regular	Milk products (21CFR 170.3(n)(31))	10	1	10
12350225	Onion dip, light	Milk products (21CFR 170.3(n)(31))	10	1	10
12350230	Ranch dip, regular	Milk products (21CFR 170.3(n)(31))	10	1	10
12350235	Ranch dip, light	Milk products (21CFR 170.3(n)(31))	10	1	10
12350240	Spinach dip, regular	Milk products (21CFR 170.3(n)(31))	10	1	10
12350245	Spinach dip, light	Milk products (21CFR 170.3(n)(31))	10	1	10
12350250	Vegetable dip, regular	Milk products (21CFR 170.3(n)(31))	10	1	10
12350255	Vegetable dip, light	Milk products (21CFR 170.3(n)(31))	10	1	10
13110000	Ice cream, NFS	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5

13110100	Ice cream, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110102	Ice cream, vanilla, with additional ingredients	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110110	Ice cream, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110112	Ice cream, chocolate, with additional ingredients	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110200	Ice cream, soft serve, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110210	Ice cream, soft serve, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110460	Gelato, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13110470	Gelato, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120050	Ice cream bar, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120100	Ice cream bar, vanilla, chocolate coated	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120110	Ice cream candy bar	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120140	Ice cream bar, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120500	Ice cream sandwich, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120510	Ice cream sandwich, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120550	Ice cream cookie sandwich	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120730	Ice cream cone, scooped, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5

13120735	Ice cream cone, scooped, vanilla, waffle cone	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120740	Ice cream cone, NFS	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120770	Ice cream cone, scooped, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120775	Ice cream cone, scooped, chocolate, waffle cone	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120782	Ice cream cone, soft serve, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120784	Ice cream cone, soft serve, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120786	Ice cream cone, soft serve, vanilla, waffle cone	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120788	Ice cream cone, soft serve, chocolate, waffle cone	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120790	Ice cream cone, vanilla, prepackaged	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13120792	Ice cream cone, chocolate, prepackaged	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13121000	Ice cream sundae, NFS	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13121100	Ice cream sundae, fruit topping	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13121120	Banana split	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13121300	Ice cream sundae, hot fudge topping	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13121400	Ice cream sundae, caramel topping	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13126000	Ice cream, fried	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5

13130100	Light ice cream, NFS	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13130300	Light ice cream, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13130310	Light ice cream, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13130700	Soft serve, blended with candy or cookies, from fast food	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13135000	Light ice cream sandwich, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13135010	Light ice cream sandwich, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13140000	Light ice cream bar, vanilla	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13140100	Light ice cream bar, vanilla, chocolate coated	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13140115	Light ice cream bar, chocolate	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13140700	Creamsicle	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13140710	Creamsicle, light	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13140900	Fudgesicle	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13142100	Light ice cream cone, vanilla, prepackaged	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13142110	Light ice cream cone, chocolate, prepackaged	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13150000	Sherbet, all flavors	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5
13161600	Fudgesicle, light	Frozen dairy desserts & Mixes (21CFR 170.3(n)(20))	5	1	5

13250000	Mousse	Gelatins, Puddings, & Fillings (21CFR 170.3(n)(22))	5	1	5
13252600	Tiramisu	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
14502000	Imitation cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	20	1	20
14620115	Spinach and artichoke dip	Milk products (21CFR 170.3(n)(31))	10	1	10
14620130	Seafood dip	Milk products (21CFR 170.3(n)(31))	10	1	10
14620150	Cheese dip with chili pepper	Cheeses (21CFR 170.3(n)(5))	10	1	10
14620200	Cheese dip	Cheeses (21CFR 170.3(n)(5))	10	1	10
14630100	Cheese fondue	Cheeses (21CFR 170.3(n)(5))	10	1	10
14640000	Cheese sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640002	Cheese sandwich, American cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640004	Cheese sandwich, American cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640006	Cheese sandwich, American cheese, on whole wheat bread, no spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640008	Cheese sandwich, cheddar cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640010	Cheese sandwich, cheddar cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640012	Cheese sandwich, Cheddar cheese, on whole wheat bread, no spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640014	Cheese sandwich, reduced fat cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640016	Cheese sandwich, reduced fat cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10

14640018	Cheese sandwich, reduced fat American cheese, on whole wheat bread, no spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640020	Cheese sandwich, reduced fat Cheddar cheese, on white bread, no spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640022	Cheese sandwich, reduced fat Cheddar cheese, on wheat bread, no spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640024	Cheese sandwich, reduced fat Cheddar cheese, on whole wheat bread, no spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640026	Cheese sandwich, American cheese, on white bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640028	Cheese sandwich, American cheese, on wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640030	Cheese sandwich, American cheese, on whole wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640032	Cheese sandwich, Cheddar cheese, on white bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640034	Cheese sandwich, Cheddar cheese, on wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640036	Cheese sandwich, Cheddar cheese, on whole wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640038	Cheese sandwich, reduced fat American cheese, on white bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640040	Cheese sandwich, reduced fat American cheese,, on wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10

14640042	Cheese sandwich, reduced fat American cheese, on whole wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640044	Cheese sandwich, reduced fat Cheddar cheese, on white bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640046	Cheese sandwich, reduced fat Cheddar cheese, on wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640048	Cheese sandwich, reduced fat Cheddar cheese, on whole wheat bread, with mayonnaise	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640050	Cheese sandwich, American cheese, on white bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640052	Cheese sandwich, American cheese, on wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640054	Cheese sandwich, American cheese, on whole wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640056	Cheese sandwich, Cheddar cheese, on white bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640058	Cheese sandwich, Cheddar cheese, on wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640060	Cheese sandwich, Cheddar cheese, on whole wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640062	Cheese sandwich, reduced fat American cheese, on white bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640064	Cheese sandwich, reduced fat American cheese, on wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640066	Cheese sandwich, reduced fat American cheese, on whole wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10

14640068	Cheese sandwich, reduced fat Cheddar cheese, on white bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640070	Cheese sandwich, reduced fat Cheddar cheese, on wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640072	Cheese sandwich, reduced fat Cheddar cheese, on whole wheat bread, with butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640100	Grilled cheese sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640105	Grilled cheese sandwich, American cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640110	Grilled cheese sandwich, American cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640115	Grilled cheese sandwich, American cheese, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640125	Grilled cheese sandwich, cheddar cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640130	Grilled cheese sandwich, cheddar cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640135	Grilled cheese sandwich, Cheddar cheese, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640155	Grilled cheese sandwich, reduced fat cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640160	Grilled cheese sandwich, reduced fat cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640165	Grilled cheese sandwich, reduced fat American cheese, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640185	Grilled cheese sandwich, reduced fat Cheddar cheese, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14640190	Grilled cheese sandwich, reduced fat Cheddar cheese, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10

14640195	Grilled cheese sandwich, reduced fat Cheddar cheese, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	5.9	0.59	10
14650100	Cheese sauce	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650160	Alfredo sauce	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650165	Alfredo sauce with added vegetables	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650170	Alfredo sauce with meat	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650175	Alfredo sauce with meat and added vegetables	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650180	Alfredo sauce with poultry	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650185	Alfredo sauce with poultry and added vegetables	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650190	Alfredo sauce with seafood	Cheeses (21CFR 170.3(n)(5))	5	1	5
14650195	Alfredo sauce with seafood and added vegetables	Cheeses (21CFR 170.3(n)(5))	5	1	5
14710100	Cheddar cheese soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
14710200	Beer cheese soup, made with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
21420100	Beef, sandwich steak	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27250520	Imitation crab meat	Plant protein products (21CFR 170.3(n)(33))	20	1	20
27450130	Crab salad made with imitation crab	Plant protein products (21CFR 170.3(n)(33))	20	1	20
27500050	Sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27500100	Meat sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27500300	Sandwich wrap, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27500400	Barbecue sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27510000	Beef sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510700	Meatball sandwich or sub	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510702	Meatloaf sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510910	Corned beef sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510920	Corned beef sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510930	Corned beef sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510940	Corned beef sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27510950	Reuben sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27511010	Pastrami sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513010	Roast beef sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513020	Roast beef sandwich, with gravy	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513040	Roast beef submarine sandwich, with lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513041	Roast beef submarine sandwich, with cheese, lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513050	Roast beef sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513055	Roast beef sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513060	Roast beef sandwich with bacon and cheese sauce	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27513065	Roast beef sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27513070	French dip sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27514010	Steak sandwich or sub on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27514020	Steak sandwich or sub on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27514030	Cheese steak sandwich or sub on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27514040	Cheese steak sandwich or sub on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515000	Steak submarine sandwich with lettuce and tomato	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515010	Steak sandwich, plain, on roll	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515020	Steak and cheese submarine sandwich, with lettuce and tomato	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515030	Steak and cheese sandwich, plain, on roll	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515040	Steak and cheese submarine sandwich, plain, on roll	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515050	Fajita-style beef sandwich with cheese, on pita bread, with lettuce and tomato	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515070	Steak and cheese submarine sandwich, with fried peppers and onions, on roll	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27515080	Steak sandwich, plain, on biscuit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27516010	Gyro sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27517000	Hamburger wrap sandwich, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27520110	Bacon sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520120	Bacon and cheese sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520140	Bacon and egg sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520150	Bacon, lettuce, and tomato sandwich with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520155	Bacon, lettuce, and tomato submarine sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520156	Bacon, lettuce, tomato, and cheese submarine sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520210	Ham sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520220	Ham sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520230	Ham sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520240	Ham sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520255	Ham sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520260	Ham sandwich or sub, with cheese, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520270	Ham sandwich wrap	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520300	Ham sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520310	Ham sandwich with lettuce and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520320	Ham and cheese sandwich, with lettuce and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27520340	Ham salad sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520345	Ham salad sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520360	Ham and cheese sandwich, on bun, with lettuce and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520370	Hot ham and cheese sandwich, on bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520390	Ham and cheese submarine sandwich, with lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520410	Cuban sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520420	Midnight sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520500	Barbecue rib sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520510	Barbecue pork sandwich, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520515	Barbecue pork sandwich, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520520	Pork sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520525	Pork sandwich, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520610	Bacon, lettuce, tomato sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27520620	Bacon, lettuce, tomato sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540010	Turkey sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540020	Turkey sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27540030	Turkey sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540040	Turkey sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540050	Turkey sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540060	Turkey sandwich or sub, with cheese, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540070	Turkey sandwich wrap	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540080	Chicken deli sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540090	Chicken deli sandwich or sub, with cheese, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540110	Sliced chicken sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540111	Sliced chicken sandwich, with cheese and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540120	Chicken salad sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540121	Chicken salad sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540122	Chicken salad sandwich wrap	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540123	Club sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540124	Club sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540125	Club sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540126	Club sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27540127	Club sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540130	Barbecue chicken sandwich, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540131	Barbecue chicken sandwich, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540132	Chicken fillet sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540139	Chicken fillet sandwich, from school cafeteria	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540146	Chicken fillet sandwich, fried, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540147	Chicken fillet sandwich, fried, from fast food, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540152	Chicken fillet sandwich, grilled, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540153	Chicken fillet sandwich, grilled, from fast food, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540160	Chicken fillet sandwich, NS as to fried or grilled, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540175	Chicken fillet sandwich, fried, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540176	Chicken fillet sandwich, fried, on white bun; with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540185	Chicken fillet sandwich, fried, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540186	Chicken fillet sandwich, fried, on wheat bun, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540195	Chicken fillet sandwich, grilled, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540196	Chicken fillet sandwich, grilled, on white bun, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27540205	Chicken fillet sandwich, grilled, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540206	Chicken fillet sandwich, grilled, on wheat bun, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540210	Chicken fillet wrap sandwich, fried, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540285	Chicken, bacon, and tomato club sandwich, with lettuce and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540290	Chicken submarine sandwich, with lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540291	Chicken submarine sandwich, with cheese, lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540295	Buffalo chicken submarine sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540296	Buffalo chicken submarine sandwich with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540300	Chicken fillet wrap sandwich, grilled, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540310	Turkey sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540320	Turkey salad or turkey spread sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540350	Turkey submarine sandwich, with cheese, lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540360	Turkey and bacon submarine sandwich, with lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27540361	Turkey and bacon submarine sandwich, with cheese, lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27541000	Turkey, ham, and roast beef club sandwich, with lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27541001	Turkey, ham, and roast beef club sandwich with cheese, lettuce, tomato, and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550000	Fish sandwich, fried, from fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550100	Fish sandwich, fried, from fast food, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550110	Crab cake sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550120	Salmon cake sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550150	Fried seafood sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550200	Fish sandwich, from school cafeteria	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550300	Fish sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550400	Fish sandwich, fried, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550405	Fish sandwich, fried, on white bun, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550410	Fish sandwich, fried, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550415	Fish sandwich, fried, on wheat bun, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550420	Fish sandwich, grilled	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550425	Fish wrap sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550510	Sardine sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550720	Tuna salad sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27550730	Tuna salad sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550735	Tuna salad sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550737	Tuna salad sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550740	Tuna salad sandwich, on bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550745	Tuna salad sandwich, on bun, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550755	Tuna salad sandwich wrap	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27550800	Seafood salad sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560000	Luncheon meat sandwich, NFS, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560110	Bologna sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560120	Bologna and cheese sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560130	Bologna sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560140	Bologna sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560150	Bologna sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560160	Bologna sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560410	Puerto Rican sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560500	Pepperoni and salami submarine sandwich, with lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27560510	Salami sandwich, with spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560520	Salami sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560530	Salami sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560540	Salami sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560550	Salami sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560610	Italian sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560620	Italian sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560630	Italian sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560660	Sausage griddle cake sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560710	Italian sausage sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560715	Italian sausage sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560720	Sausage and spaghetti sauce sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560910	Cold cut sumarine sandwich, with cheese, lettuce, tomato and spread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27560920	Spam sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27563010	Meat spread or potted meat sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27564000	Hot dog sandwich, NFS, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10

27564001	Hot dog sandwich, NFS, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564002	Frankfurter or hot dog sandwich, NFS, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564003	Frankfurter or hot dog sandwich, NFS, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564004	Frankfurter or hot dog sandwich, NFS, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564010	Hot dog sandwich, NFS, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564020	Hot dog sandwich, NFS, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564030	Frankfurter or hot dog sandwich, NFS, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564040	Frankfurter or hot dog sandwich, NFS, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564050	Frankfurter or hot dog sandwich, NFS, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564060	Hot dog sandwich, beef, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564061	Hot dog sandwich, beef, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564062	Frankfurter or hot dog sandwich, beef, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564063	Frankfurter or hot dog sandwich, beef, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564064	Frankfurter or hot dog sandwich, beef, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564070	Hot dog sandwich, beef, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564080	Hot dog sandwich, beef, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10

27564090	Frankfurter or hot dog sandwich, beef, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564100	Frankfurter or hot dog sandwich, beef, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564110	Frankfurter or hot dog sandwich, beef, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564120	Frankfurter or hot dog sandwich, beef and pork, plain, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564121	Frankfurter or hot dog sandwich, beef and pork, plain, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564122	Frankfurter or hot dog sandwich, beef and pork, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564123	Frankfurter or hot dog sandwich, beef and pork, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564124	Frankfurter or hot dog sandwich, beef and pork, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564130	Frankfurter or hot dog sandwich, beef and pork, plain, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564140	Frankfurter or hot dog sandwich, beef and pork, plain, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564150	Frankfurter or hot dog sandwich, beef and pork, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564160	Frankfurter or hot dog sandwich, beef and pork, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564170	Frankfurter or hot dog sandwich, beef and pork, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564180	Hot dog sandwich, meat and poultry, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564181	Hot dog sandwich, meat and poultry, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10

27564182	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564183	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564184	Frankfurter or hot dog sandwich, meat and poultry, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564190	Hot dog sandwich, meat and poultry, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564200	Hot dog sandwich, meat and poultry, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564210	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564220	Frankfurter or hot dog sandwich, meat and poultry, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564230	Frankfurter or hot dog sandwich, meat and poultry, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564240	Hot dog sandwich, turkey, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564241	Hot dog sandwich, turkey, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564242	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564243	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564244	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10

27564250	Hot dog sandwich, turkey, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564260	Hot dog sandwich, turkey, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564270	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564280	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564290	Frankfurter or hot dog sandwich, chicken and/or turkey, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564300	Hot dog sandwich, reduced fat, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564301	Hot dog sandwich, reduced fat, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564302	Frankfurter or hot dog sandwich, reduced fat or light, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564303	Frankfurter or hot dog sandwich, reduced fat or light, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564304	Frankfurter or hot dog sandwich, reduced fat or light, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564310	Hot dog sandwich, reduced fat, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564320	Hot dog sandwich, reduced fat, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564330	Frankfurter or hot dog sandwich, reduced fat or light, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564340	Frankfurter or hot dog sandwich, reduced fat or light, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10

27564350	Frankfurter or hot dog sandwich, reduced fat or light, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564360	Frankfurter or hot dog sandwich, fat free, plain, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564361	Frankfurter or hot dog sandwich, fat free, plain, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564362	Frankfurter or hot dog sandwich, fat free, plain, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564363	Frankfurter or hot dog sandwich, fat free, plain, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564364	Frankfurter or hot dog sandwich, fat free, plain, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564370	Frankfurter or hot dog sandwich, fat free, plain, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564380	Frankfurter or hot dog sandwich, fat free, plain, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564390	Frankfurter or hot dog sandwich, fat free, plain, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564400	Frankfurter or hot dog sandwich, fat free, plain, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564410	Frankfurter or hot dog sandwich, fat free, plain, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564418	Frankfurter or hot dog sandwich, reduced sodium	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564420	Hot dog sandwich, vegetarian, on bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564430	Hot dog sandwich, vegetarian, on bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564440	Chili hot dog sandwich, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564441	Chili hot dog sandwich, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10

27564442	Frankfurter or hot dog sandwich, with chili, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564443	Frankfurter or hot dog sandwich, with chili, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564444	Frankfurter or hot dog sandwich, with chili, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564450	Chili hot dog sandwich, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564460	Chili hot dog sandwich, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564470	Frankfurter or hot dog sandwich, with chili, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564480	Frankfurter or hot dog sandwich, with chili, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564490	Frankfurter or hot dog sandwich, with chili, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564500	Frankfurter or hot dog sandwich, with meatless chili, on white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564501	Frankfurter or hot dog sandwich, with meatless chili, on wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564502	Frankfurter or hot dog sandwich, with meatless chili, on whole wheat bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564503	Frankfurter or hot dog sandwich, with meatless chili, on whole grain white bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564504	Frankfurter or hot dog sandwich, with meatless chili, on multigrain bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	4.4	0.44	10
27564510	Frankfurter or hot dog sandwich, with meatless chili, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10
27564520	Frankfurter or hot dog sandwich, with meatless chili, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10
27564530	Frankfurter or hot dog sandwich, with meatless chili, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10

27564540	Frankfurter or hot dog sandwich, with meatless chili, on whole grain white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10
27564550	Frankfurter or hot dog sandwich, with meatless chili, on multigrain bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10
27564560	Frankfurter or hot dog sandwich, meatless, on bun, with meatless chili	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10
27564570	Frankfurter or hot dog sandwich, meatless, on bread, with meatless chili	Baked goods & Baking mixes (21CFR 170.3(n)(1))	2	0.2	10
27580010	Multiple meat sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580020	Multiple meat sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580030	Multiple meat sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580040	Multiple meat sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580050	Multiple meat sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580060	Multiple meat sandwich or sub, with cheese, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580070	Multiple meat sandwich wrap	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580110	Turkey and ham sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580120	Turkey and ham sandwich on white, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580130	Turkey and ham sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580140	Turkey and ham sandwich on wheat, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
27580150	Turkey and ham sandwich or sub, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10

27580160	Turkey and ham sandwich or sub, with cheese, restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.3	0.63	10
28310110	Beef, broth, bouillon, or consommé	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28310150	Oxtail soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28310320	Beef noodle soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28310330	Pho	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28310420	Beef and rice soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28311010	Pepperpot soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28311030	Menudo soup, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28315050	Beef vegetable soup with potato, pasta, or rice, chunky style, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28315160	Italian Wedding Soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28317010	Beef stroganoff soup, chunky style, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28320140	Ham, noodle, and vegetable soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28320160	Pork vegetable soup with potato, pasta, or rice, stew type, chunky style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28320300	Pork with vegetable excluding carrots, broccoli and/or dark-green leafy; soup, Asian Style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28321130	Bacon soup, cream of, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28331110	Lamb, pasta, and vegetable soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340110	Chicken or turkey broth, bouillon, or consomme	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340150	Mexican style chicken broth soup stock	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

28340179	Beef broth, less or reduced sodium, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340180	Chicken or turkey broth, less or reduced sodium, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340210	Chicken rice soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340220	Chicken soup with noodles and potatoes, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340310	Chicken or turkey gumbo soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340510	Chicken or turkey noodle soup, chunky style, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340550	Sweet and sour soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340580	Chicken or turkey soup with vegetables, broccoli, carrots, celery, potatoes and onions, Asian style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340600	Chicken or turkey vegetable soup, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340610	Chicken or turkey vegetable soup, stew type	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340630	Chicken or turkey vegetable soup with rice, stew type, chunky style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340640	Chicken or turkey vegetable soup with noodles, stew type, chunky style, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340690	Chicken or turkey vegetable soup with potato and cheese, chunky style, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340700	Bird's nest soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340750	Hot and sour soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28340800	Chicken or turkey soup with vegetables and fruit, Asian Style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

28345010	Chicken or turkey soup, cream of, canned, reduced sodium, NS as to made with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28345020	Chicken or turkey soup, cream of, canned, reduced sodium, made with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28345030	Chicken or turkey soup, cream of, canned, reduced sodium, made with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28345110	Chicken or turkey soup, cream of, NS as to prepared with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28345120	Chicken or turkey soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28345130	Chicken or turkey soup, cream of, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28345160	Chicken or turkey mushroom soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28350050	Fish chowder	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28350110	Crab soup, NS as to tomato-base or cream style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28350120	Crab soup, tomato-base	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28350210	Clam chowder, NS as to Manhattan or New England style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28350220	Clam chowder, Manhattan	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28350310	Turtle and vegetable soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28351110	Fish and vegetable soup, no potatoes, Mexican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28351120	Fish soup with potatoes, Mexican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28351160	Codfish, rice, and vegetable soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28351170	Codfish soup with noodles, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

28355110	Clam chowder, New England, NS as to prepared with water or milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355120	Clam chowder, New England, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355130	Clam chowder, New England, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355140	Clam chowder, New England, reduced sodium, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355210	Crab soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355250	Lobster bisque	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355310	Oyster stew	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355350	Salmon soup, cream style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355410	Shrimp soup, cream of, NS as to prepared with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355420	Shrimp soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355430	Shrimp soup, cream of, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355450	Seafood soup with potatoes and vegetables including carrots, broccoli, and/or dark-green leafy	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355460	Seafood soup with potatoes, and vegetables excluding carrots, broccoli, and dark-green leafy	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355470	Seafood soup with vegetables including carrots, broccoli, and/or dark-green leafy; no potatoes	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28355480	Seafood soup with vegetables excluding carrots, broccoli, and dark-green leafy; no potatoes	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28360100	Meat broth, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

28360210	Spanish vegetable soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
28522000	Mole sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
32203010	Egg salad sandwich on white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
32203020	Egg salad sandwich on wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
32204010	Scrambled egg sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
32300100	Egg drop soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
32301100	Garlic egg soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
33001010	Egg substitute, omelet, scrambled, or fried, fat added	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33001050	Egg substitute, omelet, scrambled, or fried, no added fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401000	Egg substitute, omelet, scrambled, or fried, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401100	Egg substitute, omelet, scrambled, or fried, with meat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401200	Egg substitute, omelet, scrambled, or fried, with vegetables	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401300	Egg substitute, omelet, scrambled, or fried, with cheese and meat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401400	Egg substitute, omelet, scrambled, or fried, with cheese and vegetables	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401500	Egg substitute, omelet, scrambled, or fried, with meat and vegetables	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
33401600	Egg substitute, omelet, scrambled, or fried, with cheese, meat, and vegetables	Baked goods & Baking mixes (21CFR 170.3(n)(1))	15	0.75	20
34001100	Egg sandwich on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10

34001110	Egg sandwich on white bread, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001120	Egg sandwich on white bread, with meat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001130	Egg sandwich on white bread, with meat and cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001200	Egg sandwich on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001210	Egg sandwich on wheat bread, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001220	Egg sandwich on wheat bread, with meat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001230	Egg sandwich on wheat bread, with meat and cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001300	Egg sandwich on English muffin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001310	Egg sandwich on English muffin, with sausage	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001320	Egg sandwich on English muffin, with bacon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001330	Egg sandwich on English muffin, with ham	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001400	Egg sandwich on croissant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001410	Egg sandwich on croissant, with sausage	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001420	Egg sandwich on croissant, with bacon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001430	Egg sandwich on croissant, with ham	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001500	Egg sandwich on biscuit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10

34001510	Egg sandwich on biscuit, with sausage	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001520	Egg sandwich on biscuit, with sausage and cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001530	Egg sandwich on biscuit, with bacon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001540	Egg sandwich on biscuit, with bacon and cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001600	Egg sandwich on bagel	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001610	Egg sandwich on bagel, with sausage	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001620	Egg sandwich on bagel, with bacon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001630	Egg sandwich on bagel, with ham	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001700	Egg sandwich on griddle/pancake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34001710	Egg sandwich on griddle/pancake, with meat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34002000	Egg white sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34002010	Egg white sandwich, with cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
34002020	Egg white sandwich, with meat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	3.4	0.34	10
41205100	Black bean sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
41310900	Bean chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
41410015	Soy chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
41440000	Textured vegetable protein, dry	Plant protein products (21CFR 170.3(n)(33))	20	1	20
41601010	Bean soup, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

41601020	Bean with bacon or ham soup, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601030	Black bean soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601040	Lima bean soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601070	Soybean soup, miso broth	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601080	Pinto bean soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601090	Bean soup, with macaroni, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601110	Bean and ham soup, chunky style, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601130	Bean soup, mixed beans, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601160	Bean and ham soup, canned, reduced sodium, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41601200	Liquid from stewed kidney beans, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41602010	Pea and ham soup, chunky style, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41602020	Garbanzo bean or chickpea soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41602030	Split pea and ham soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41602050	Split pea soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41602070	Split pea soup, canned, reduced sodium, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41602090	Split pea and ham soup, canned, reduced sodium, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

41603010	Lentil soup, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
41812450	Vegetarian chili, made with meat substitute	Plant protein products (21CFR 170.3(n)(33))	20	1	20
42204050	Peanut sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
42204100	Gravy, vegetarian	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
42301010	Peanut butter sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42301015	Peanut butter sandwich, with regular peanut butter, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42301020	Peanut butter sandwich, with regular peanut butter, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42301025	Peanut butter sandwich, with regular peanut butter, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42301115	Peanut butter sandwich, with reduced fat peanut butter, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42301120	Peanut butter sandwich, with reduced fat peanut butter, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42301125	Peanut butter sandwich, with reduced fat peanut butter, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302010	Peanut butter and jelly sandwich, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302015	Peanut butter and jelly sandwich, with regular peanut butter, regular jelly, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302020	Peanut butter and jelly sandwich, with regular peanut butter, regular jelly, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302025	Peanut butter and jelly sandwich, with regular peanut butter, regular jelly, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10

42302055	Peanut butter and jelly sandwich, with reduced fat peanut butter, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302060	Peanut butter and jelly sandwich, with reduced fat peanut butter, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302065	Peanut butter and jelly sandwich, with reduced fat peanut butter, regular jelly, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302105	Peanut butter and jelly sandwich, with regular peanut butter, reduced sugar jelly, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302110	Peanut butter and jelly sandwich, with regular peanut butter, reduced sugar jelly, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302115	Peanut butter and jelly sandwich, with regular peanut butter, reduced sugar jelly, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302155	Peanut butter and jelly sandwich, with reduced fat peanut butter, reduced sugar jelly, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302160	Peanut butter and jelly sandwich, with reduced fat peanut butter, reduced sugar jelly, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42302165	Peanut butter and jelly sandwich, with reduced fat peanut butter, reduced sugar jelly, on whole wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42303100	Peanut butter and jelly sandwich, frozen commercial product without crusts	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42304010	Almond butter sandwich, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10

42304020	Almond butter sandwich, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42304030	Almond butter and jelly sandwich, on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42304040	Almond butter and jelly sandwich, on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42305010	Nutella sandwich on white bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42305020	Nutella sandwich on wheat bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	6.5	0.65	10
42401010	Coconut milk, used in cooking	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
42402010	Coconut cream, canned, sweetened	Dairy product analogs (21CFR 170.3(n)(10))	6.25	1	6.25
42403010	Coconut water, unsweetened	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
42404010	Coconut water, sweetened	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
51000100	Bread, NS as to major flour	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51000110	Bread, NS as to major flour, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51000180	Bread, made from home recipe or purchased at a bakery, NS as to major flour	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51000190	Bread, made from home recipe or purchased at a bakery, toasted, NS as to major flour	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51000200	Roll, NS as to major flour	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51000300	Roll, hard, NS as to major flour	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51000400	Roll, bran, NS as to type of bran	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51101000	Bread, white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51101010	Bread, white, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51101050	Bread, white, made from home recipe or purchased at a bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51101060	Bread, white, made from home recipe or purchased at a bakery, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51102010	Bread, white with whole wheat swirl	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51102020	Bread, white with whole wheat swirl, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51105010	Bread, Cuban	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51105040	Bread, Cuban, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51106010	Bread, native, water, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51106020	Bread, native, water, toasted, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51106200	Bread, lard, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51106210	Bread, lard, toasted, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51106300	Bread, caressed, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51106310	Bread, caressed, toasted, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51107010	Bread, French or Vienna	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51107040	Bread, French or Vienna, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51108010	Focaccia, Italian, plain	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51108100	Bread, naan	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51109010	Bread, Italian, Grecian, Armenian	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51109040	Bread, Italian, Grecian, Armenian, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51109100	Bread, pita	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51109110	Bread, pita, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51109150	Bread, pita with fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51109200	Bread, pita with fruit, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51111010	Bread, cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51111040	Bread, cheese, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51113010	Bread, cinnamon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51113100	Bread, cinnamon, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51115010	Bread, cornmeal and molasses	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51115020	Bread, cornmeal and molasses, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51119010	Bread, egg, Challah	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51119040	Bread, egg, Challah, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51121015	Garlic bread, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121025	Garlic bread, from fast food / restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121035	Garlic bread, from frozen	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121045	Garlic bread, with parmesan cheese, from fast food / restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121055	Garlic bread, with parmesan cheese, from frozen	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121065	Garlic bread, with melted cheese, from fast food / restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121075	Garlic bread, with melted cheese, from frozen	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121110	Bread, onion	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51121120	Bread, onion, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51122000	Bread, reduced calorie and/or high fiber, white or NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51122010	Bread, reduced calorie and/or high fiber, white or NFS, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51122100	Bread, reduced calorie and/or high fiber, white or NFS, with fruit and/or nuts	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51122110	Bread, reduced calorie and/or high fiber, white or NFS, with fruit and/or nuts, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51122300	Bread, white, special formula, added fiber	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51122310	Bread, white, special formula, added fiber, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51123010	Bread, high protein	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51123020	Bread, high protein, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51127010	Bread, potato	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51127020	Bread, potato, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51129010	Bread, raisin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51129020	Bread, raisin, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51130510	Bread, white, low sodium or no salt	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51130520	Bread, white, low sodium or no salt, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51133010	Bread, sour dough	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51133020	Bread, sour dough, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51134000	Bread, sweet potato	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51134010	Bread, sweet potato, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51135000	Bread, vegetable	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51135010	Bread, vegetable, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51140100	Bread, dough, fried	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51150000	Roll, white, soft	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51153000	Roll, white, hard	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51154010	Roll, white, hot dog bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51154100	Roll, white, hamburger bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51154510	Roll, diet	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51154550	Roll, egg bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51154600	Roll, cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51155000	Roll, French or Vienna	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51156500	Roll, garlic	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51157000	Roll, white, hoagie, submarine	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51158100	Roll, Mexican, bolillo	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51159000	Roll, sour dough	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51166000	Croissant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51166100	Croissant, cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51166200	Croissant, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51166500	Croissant, fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51183990	Breadsticks, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51184200	Breadsticks, soft, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51184210	Breadsticks, soft, fast food / restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51184220	Breadsticks, soft, frozen	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51184230	Breadsticks, soft, with parmesan cheese, fast food / restaurant	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51184240	Breadsticks, soft, with parmesan cheese, from frozen	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51184250	Breadsticks, soft, topped with melted cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51184260	Breadsticks, soft, stuffed or topped with melted cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51185000	Croutons	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51187020	Anisette toast	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300050	Bread, whole grain white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300060	Bread, whole grain white, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300110	Bread, whole wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300120	Bread, whole wheat, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300140	Bread, whole wheat, made from home recipe or purchased at bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300150	Bread, whole wheat, made from home recipe or purchased at bakery, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300175	Bread, chappatti or roti	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300180	Bread, puri	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51300185	Bread, paratha	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300210	Bread, whole wheat, with raisins	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300220	Bread, whole wheat, with raisins, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300300	Bread, sprouted wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51300310	Bread, sprouted wheat, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301010	Bread, wheat or cracked wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301020	Bread, wheat or cracked wheat, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301040	Bread, wheat or cracked wheat, made from home recipe or purchased at bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301050	Bread, wheat or cracked wheat, made from home recipe or purchased at bakery, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301120	Bread, wheat or cracked wheat, with raisins	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301130	Bread, wheat or cracked wheat, with raisins, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301510	Bread, wheat or cracked wheat, reduced calorie and/or high fiber	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301520	Bread, wheat or cracked wheat, reduced calorie and/or high fiber, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301540	Bread, French or Vienna, whole wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301550	Bread, French or Vienna, whole wheat, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301600	Bread, pita, whole wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51301610	Bread, pita, whole wheat, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301620	Bread, pita, wheat or cracked wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51301630	Bread, pita, wheat or cracked wheat, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320010	Roll, wheat or cracked wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320060	Roll, wheat or cracked wheat, hot dog bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320070	Roll, wheat or cracked wheat, hamburger bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320500	Roll, whole wheat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320550	Roll, whole wheat, hot dog bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320560	Roll, whole wheat, hamburger bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320700	Roll, whole grain white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320710	Roll, whole grain white, hot dog bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51320720	Roll, whole grain white, hamburger bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51401010	Bread, rye	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51401020	Bread, rye, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51401030	Bread, marble rye and pumpernickel	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51401040	Bread, marble rye and pumpernickel, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51404010	Bread, pumpernickel	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51404020	Bread, pumpernickel, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51407010	Bread, black	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51407020	Bread, black, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51420000	Roll, rye	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51421000	Roll, pumpernickel	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51501010	Bread, oatmeal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51501020	Bread, oatmeal, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51501040	Bread, oat bran	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51501050	Bread, oat bran, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51502010	Roll, oatmeal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51601010	Bread, multigrain, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51601020	Bread, multigrain	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51601210	Bread, multigrain, with raisins	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51601220	Bread, multigrain, with raisins, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51602010	Bread, multigrain, reduced calorie and/or high fiber	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

51602020	Bread, multigrain, reduced calorie and/or high fiber, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51620000	Roll, multigrain	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51620020	Roll, multigrain, hot dog bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51620030	Roll, multigrain, hamburger bun	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51801010	Bread, barley	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51801020	Bread, barley, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51804010	Bread, soy	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51804020	Bread, soy, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51805010	Bread, sunflower meal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51805020	Bread, sunflower meal, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51806010	Bread, rice	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51806020	Bread, rice, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51807000	Injera, Ethiopian bread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51808000	Bread, gluten free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51808010	Bread, gluten free, toasted	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
51808100	Roll, gluten free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

52105100	Scone	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
52105200	Scone, with fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53100050	Cake batter, raw, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53100070	Cake batter, raw, not chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53100100	Cake or cupcake, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53101100	Cake, angel food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53101200	Cake, angel food, with icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53101250	Cake, angel food, with fruit and icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53102100	Cake or cupcake, applesauce, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53102200	Cake or cupcake, apple	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53102600	Cake or cupcake, banana, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53102700	Cake or cupcake, banana	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53102800	Cake or cupcake, Black Forest	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53103000	Cake, Boston cream pie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53104100	Cake or cupcake, carrot, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53104260	Cake or cupcake, carrot	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53104300	Cake, carrot, diet	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53104400	Cake or cupcake, coconut	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53104500	Cheesecake, plain	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53104550	Cheesecake, fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53104600	Cheesecake, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105262	Cake or cupcake, chocolate with white icing, bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105264	Cake or cupcake, chocolate with white icing, from mix	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105270	Cake or cupcake, chocolate with chocolate icing, bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105272	Cake or cupcake, chocolate with chocolate icing, from mix	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105275	Cake or cupcake, chocolate, no icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105300	Cake or cupcake, German chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105310	Cake or cupcake, gluten free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105396	Cake, chocolate, flourless	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53105500	Cake, chocolate, with icing, diet	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53106500	Cake, cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53108200	Snack cake, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53108220	Snack cake, chocolate, with icing or filling, reduced fat and calories	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53109200	Snack cake, white	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53109220	Snack cake, not chocolate, with icing or filling, reduced fat and calories	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53109300	Cake, Dobos Torte	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53110000	Cake, fruit cake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53111000	Cake or cupcake, gingerbread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53112100	Ice cream cake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53113000	Cake, jelly roll	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53114000	Cake or cupcake, lemon, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53114100	Cake or cupcake, lemon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53115100	Cake or cupcake, marble, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53115200	Cake or cupcake, marble	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53115310	Cake or cupcake, nut, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53115320	Cake or cupcake, nut, with icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53115410	Cake or cupcake, oatmeal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53115450	Cake or cupcake, peanut butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53116000	Cake, pound	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116020	Cake, pound, with icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116270	Cake, pound, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116350	Cake, pound, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116390	Cake, pound, reduced fat, cholesterol free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116500	Cake or cupcake, pumpkin, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116510	Cake or cupcake, pumpkin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116520	Cake or cupcake, red velvet	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116550	Cake or cupcake, raisin-nut	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116570	Cake, Ravani	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116600	Cake, rice flour, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53116650	Cake, Quezadilla, El Salvadorian style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53117100	Cake or cupcake, spice, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53117200	Cake or cupcake, spice	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53118100	Cake, sponge	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53118110	Cake or cupcake, strawberry	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53118200	Cake, sponge, with icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53118300	Cake, sponge, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53118410	Rum cake, without icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53118500	Cake, torte	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53118550	Cake, tres leche	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53119000	Cake, pineapple, upside down	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53120270	Cake or cupcake, white with white icing, bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53120272	Cake or cupcake, white with white icing, from mix	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53120275	Cake or cupcake, white, without icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53121270	Cake or cupcake, white with chocolate icing, bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53121272	Cake or cupcake, white with chocolate icing, from mix	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53121275	Cake or cupcake, white, no icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53122070	Cake, shortcake, biscuit type, with whipped cream and fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53122080	Cake, shortcake, biscuit type, with fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53123070	Cake, strawberry shortcake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53123080	Cake, shortcake, sponge type, with fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53123500	Cake, shortcake, with whipped topping and fruit, diet	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53124110	Cake or cupcake, zucchini	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53200100	Cookie, batter or dough, raw	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53201000	Cookie, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53202000	Cookie, almond	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53203000	Cookie, applesauce	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53203500	Cookie, biscotti	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53204000	Cookie, brownie, NS as to icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53204010	Cookie, brownie, without icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53204100	Cookie, brownie, with icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53204840	Cookie, brownie, reduced fat, NS as to icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53204860	Cookie, brownie, fat free, NS as to icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53205250	Cookie, butterscotch, brownie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53205260	Cookie, bar, with chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53206000	Cookie, chocolate chip	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53206020	Cookie, chocolate chip, made from home recipe or purchased at a bakery	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53206030	Cookie, chocolate chip, reduced fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53206100	Cookie, chocolate chip sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53206500	Cookie, chocolate, made with rice cereal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53206550	Cookie, chocolate, made with oatmeal and coconut, no bake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53207000	Cookie, chocolate or fudge	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53207020	Cookie, chocolate or fudge, reduced fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53207050	Cookie, chocolate, with chocolate filling or coating, fat free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53208000	Cookie, marshmallow, chocolate-covered	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53208200	Cookie, marshmallow pie, chocolate covered	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53209005	Cookie, chocolate, with icing or coating	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53209010	Cookie, sugar wafer, chocolate-covered	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53209015	Cookie, chocolate sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53209020	Cookie, chocolate sandwich, reduced fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53209100	Cookie, chocolate, sandwich, with extra filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53209500	Cookie, chocolate and vanilla sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53210000	Cookie, chocolate wafer	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53210900	Cookie, graham cracker with chocolate and marshmallow	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53211000	Cookie bar, with chocolate, nuts, and graham crackers	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53215500	Cookie, coconut	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53220000	Cookie, fruit-filled bar	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53220010	Cookie, fruit-filled bar, fat free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53220030	Cookie, fig bar	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53220040	Cookie, fig bar, fat free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53222010	Cookie, fortune	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53222020	Cookie, cone shell, ice cream type, wafer or cake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53223000	Cookie, gingersnaps	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53223100	Cookie, granola	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53224000	Cookie, ladyfinger	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53224250	Cookie, lemon bar	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53225000	Cookie, macaroon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53226000	Cookie, marshmallow, with coconut	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53226500	Cookie, marshmallow, with rice cereal, no bake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53226550	Cookie, marshmallow, with rice cereal and chocolate chips	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53226600	Cookie, marshmallow and peanut butter, with oat cereal, no bake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53228000	Cookie, meringue	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53230000	Cookie, molasses	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53231000	Cookie, Lebkuchen	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53231400	Cookie, multigrain, high fiber	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233000	Cookie, oatmeal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233010	Cookie, oatmeal, with raisins	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233040	Cookie, oatmeal, reduced fat, NS as to raisins	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233050	Cookie, oatmeal sandwich, with creme filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233060	Cookie, oatmeal, with chocolate chips	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233080	Cookie, oatmeal sandwich, with peanut butter and jelly filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53233100	Cookie, oatmeal, with chocolate and peanut butter, no bake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53234000	Cookie, peanut butter	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53234100	Cookie, peanut butter, with chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53234250	Cookie, peanut butter with rice cereal, no bake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53235000	Cookie, peanut butter sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53235500	Cookie, with peanut butter filling, chocolate-coated	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53235600	Cookie, Pfeffernusse	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53236000	Cookie, Pizzelle	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53236100	Cookie, pumpkin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53237000	Cookie, raisin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53237010	Cookie, raisin sandwich, cream-filled	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53237500	Cookie, rum ball, no bake	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53238000	Cookie, sandwich-type, not chocolate or vanilla	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53239000	Cookie, shortbread	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53239010	Cookie, shortbread, reduced fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53239050	Cookie, shortbread, with icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53239100	Pocky	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53240000	Cookie, animal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53240010	Cookie, animal, with frosting or icing	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53241500	Cookie, butter or sugar	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53241510	Marie biscuit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53241600	Cookie, butter or sugar, with fruit and/or nuts	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53242000	Cookie, sugar wafer	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53242500	Cookie, toffee bar	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53243000	Cookie, vanilla sandwich	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53243010	Cookie, vanilla sandwich, extra filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53243050	Cookie, vanilla sandwich, reduced fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53244010	Cookie, butter or sugar, with chocolate icing or filling	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53244020	Cookie, butter or sugar, with icing or filling other than chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53246000	Cookie, tea, Japanese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53247000	Cookie, vanilla wafer	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53247050	Cookie, vanilla wafer, reduced fat	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53247500	Cookie, vanilla with caramel, coconut, and chocolate coating	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53251100	Cookie, rugelach	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53260030	Cookie, chocolate chip, sugar free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53260200	Cookie, oatmeal, sugar free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53260300	Cookie, sandwich, sugar free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53260400	Cookie, sugar or plain, sugar free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53260500	Cookie, sugar wafer, sugar free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53260600	Cookie, peanut butter, sugar free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53261000	Cookie, gluten free	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53270100	Cookies, Puerto Rican style	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53300100	Pie, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53300170	Pie, individual size or tart, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53300180	Pie, fried, NFS	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53300200	Tart, all types	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53301000	Pie, apple	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53301070	Pie, apple, fast food	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53301080	Pie, apple, fried pie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53301500	Pie, apple, one crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53302000	Pie, apricot, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53302070	Pie, apricot, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53302080	Pie, apricot, fried pie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53303000	Pie, blackberry, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53303070	Pie, blackberry, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53303500	Pie, berry	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53303510	Pie, berry, not blackberry, blueberry, boysenberry, huckleberry, raspberry, or strawberry; one crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53303570	Pie, berry, not blackberry, blueberry, boysenberry, huckleberry, raspberry, or strawberry, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53304000	Pie, blueberry	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53304070	Pie, blueberry, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305000	Pie, cherry	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305010	Pie, cherry, one crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305070	Pie, cherry, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305080	Pie, cherry, fried pie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305700	Pie, lemon	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305720	Pie, lemon, not cream or meringue, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53305750	Pie, lemon, fried pie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53305800	Pie, key lime	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53306000	Pie, mince, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53307000	Pie, peach	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53307050	Pie, peach, one crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53307070	Pie, peach, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53307080	Pie, peach, fried pie	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53307500	Pie, pear, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53307570	Pie, pear, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53308000	Pie, pineapple, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53308070	Pie, pineapple, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53309000	Pie, raisin, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53309070	Pie, raisin, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53310000	Pie, raspberry, one crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53310050	Pie, raspberry, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53311000	Pie, rhubarb, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53312000	Pie, strawberry	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53313000	Pie, strawberry-rhubarb, two crust	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53314000	Pie, strawberry, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53340000	Pie, apple-sour cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53340500	Pie, cherry, made with cream cheese and sour cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53341000	Pie, banana cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53341070	Pie, banana cream, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53341500	Pie, buttermilk	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53341750	Pie, chess	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53342000	Pie, chocolate cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53342070	Pie, chocolate cream, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53343000	Pie, coconut cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53343070	Pie, coconut cream, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53344000	Pie, custard	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53344070	Pie, custard, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53344200	Mixed fruit tart filled with custard or cream cheese	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53344300	Dessert pizza	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53345000	Pie, lemon cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53345070	Pie, lemon cream, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53346000	Pie, peanut butter cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53346500	Pie, pineapple cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53347000	Pie, pumpkin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53347070	Pie, pumpkin, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53347500	Pie, sour cream, raisin	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53347600	Pie, squash	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53348000	Pie, strawberry cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53348070	Pie, strawberry cream, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53360000	Pie, sweet potato	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53365000	Pie, vanilla cream	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53370000	Pie, chiffon, not chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53371000	Pie, chiffon, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53373000	Pie, black bottom	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53381000	Pie, lemon meringue	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10

53381070	Pie, lemon meringue, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53382000	Pie, chocolate-marshmallow	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53385000	Pie, pecan	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53385070	Pie, pecan, individual size or tart	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53385500	Pie, oatmeal	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53386000	Pie, pudding, flavors other than chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53387000	Pie, Toll house chocolate chip	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53390000	Pie, shoo-fly	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53390100	Pie, tofu with fruit	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53391000	Pie shell	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53391100	Pie shell, graham cracker	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53391150	Pie shell, chocolate	Baked goods & Baking mixes (21CFR 170.3(n)(1))	10	1	10
53710400	Cereal or granola bar (General Mills Fiber One Chewy Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710500	Cereal or granola bar (Kellogg's Nutri-Grain Cereal Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710502	Cereal or granola bar (Kellogg's Nutri-Grain Yogurt Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710504	Cereal or granola bar (Kellogg's Nutri-Grain Fruit and Nut Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710600	Milk 'n Cereal bar	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

53710700	Cereal or granola bar (Kellogg's Special K bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710810	Cereal or granola bar (KIND Fruit and Nut Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710900	Cereal or granola bar (General Mills Nature Valley Chewy Trail Mix)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710902	Cereal or granola bar, with yogurt coating (General Mills Nature Valley Chewy Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710904	Cereal or granola bar (General Mills Nature Valley Sweet and Salty Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53710906	Cereal or granola bar (General Mills Nature Valley Crunchy Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53711000	Cereal or granola bar (Quaker Chewy Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53711002	Cereal or granola bar (Quaker Chewy 90 Calorie Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53711004	Cereal or granola bar (Quaker Chewy 25% Less Sugar Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53711006	Cereal or granola bar (Quaker Chewy Dipps Granola Bar)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53711100	Cereal or granola bar (Quaker Granola Bites)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53712000	Snack bar, oatmeal	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53712100	Cereal or Granola bar, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53712200	Cereal or granola bar, lowfat, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53712210	Cereal or granola bar, nonfat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53713000	Cereal or granola bar, reduced sugar, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53713010	Cereal or granola bar, fruit and nut	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53713100	Cereal or granola bar, peanuts , oats, sugar, wheat germ	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

53714200	Cereal or granola bar, chocolate coated, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714210	Cereal or granola bar, with coconut, chocolate coated	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714220	Cereal or granola bar with nuts, chocolate coated	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714230	Cereal or granola bar, oats, nuts, coated with non-chocolate coating	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714250	Cereal or granola bar, coated with non-chocolate coating	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714300	Cereal or granola bar, high fiber, coated with non-chocolate yogurt coating	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714400	Cereal or granola bar, with rice cereal	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714500	Breakfast bar, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714510	Breakfast bar, date, with yogurt coating	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53714520	Breakfast bar, cereal crust with fruit filling, lowfat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
53720100	Nutrition bar (Balance Original Bar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720200	Nutrition bar (Clif Bar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720210	Nutrition bar (Clif Kids Organic Zbar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720300	Nutrition bar (PowerBar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720400	Nutrition bar (Slim Fast Original Meal Bar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720500	Nutrition bar (Snickers Marathon Protein Bar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720600	Nutrition bar (South Beach Living Meal Bar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720610	Nutrition bar (South Beach Living High Protein Bar)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720700	Nutrition bar (Tiger's Milk)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53720800	Nutrition bar (Zone Perfect Classic Crunch)	Snack foods (21CFR 170.3(n)(37))	20	1	20
53729000	Nutrition bar or meal replacement bar, NFS	Snack foods (21CFR 170.3(n)(37))	20	1	20

54001000	Crackers, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54102050	Crackers, oatmeal	Snack foods (21CFR 170.3(n)(37))	10	1	10
54103000	Crackers, breakfast biscuit	Snack foods (21CFR 170.3(n)(37))	10	1	10
54200100	Crackers, butter, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54201010	Crackers, matzo, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54204020	Crackers, wheat, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54204030	Crackers, woven wheat, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54301010	Crackers, butter, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54301020	Crackers, butter, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54301030	Crackers, butter (Ritz)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54301100	Crackers, butter, reduced fat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54304000	Crackers, cheese	Snack foods (21CFR 170.3(n)(37))	10	1	10
54304005	Crackers, cheese (Cheez-It)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54304020	Crackers, cheese (Goldfish)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54304100	Crackers, cheese, reduced fat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54304110	Crackers, cheese, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54304150	Crackers, cheese, whole grain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54305010	Crackers, crispbread	Snack foods (21CFR 170.3(n)(37))	10	1	10
54305020	Crackers, flatbread	Snack foods (21CFR 170.3(n)(37))	10	1	10
54307000	Crackers, matzo	Snack foods (21CFR 170.3(n)(37))	10	1	10
54308000	Crackers, milk	Snack foods (21CFR 170.3(n)(37))	10	1	10
54318000	Chips, rice	Snack foods (21CFR 170.3(n)(37))	10	1	10
54318500	Rice cake	Snack foods (21CFR 170.3(n)(37))	10	1	10
54319000	Crackers, rice	Snack foods (21CFR 170.3(n)(37))	10	1	10
54319005	Crackers, rice and nuts	Snack foods (21CFR 170.3(n)(37))	10	1	10

54319020	Popcorn cake	Snack foods (21CFR 170.3(n)(37))	10	1	10
54319500	Rice paper	Snack foods (21CFR 170.3(n)(37))	10	1	10
54326000	Crackers, multigrain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328000	Crackers, sandwich	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328100	Crackers, sandwich, peanut butter filled	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328105	Crackers, sandwich, peanut butter filled (Ritz)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328110	Crackers, sandwich, reduced fat, peanut butter filled	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328120	Crackers, whole grain, sandwich, peanut butter filled	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328200	Crackers, sandwich, cheese filled	Snack foods (21CFR 170.3(n)(37))	10	1	10
54328210	Crackers, sandwich, cheese filled (Ritz)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54336000	Crackers, water	Snack foods (21CFR 170.3(n)(37))	10	1	10
54336100	Crackers, wonton	Snack foods (21CFR 170.3(n)(37))	10	1	10
54337010	Crackers, woven wheat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54337020	Crackers, woven wheat, plain (Triscuit)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54337030	Crackers, woven wheat, flavored (Triscuit)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54337060	Crackers, woven wheat, reduced fat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54338000	Crackers, wheat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54338010	Crackers, wheat, plain (Wheat Thins)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54338020	Crackers, wheat, flavored (Wheat Thins)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54338100	Crackers, wheat, reduced fat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54339000	Crackers, corn	Snack foods (21CFR 170.3(n)(37))	10	1	10
54340100	Crackers, gluten free, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54340110	Crackers, gluten free, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401011	Corn nuts	Snack foods (21CFR 170.3(n)(37))	10	1	10

54401021	Corn chips, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401026	Corn chips, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401031	Corn chips, plain (Fritos)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401035	Corn chips, flavored (Fritos)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401055	Cheese flavored corn snacks	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401065	Cheese flavored corn snacks, reduced fat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401075	Tortilla chips, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401081	Cheese flavored corn snacks (Cheetos)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401085	Tortilla chips, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401090	Corn chips, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401095	Tortilla chips, popped	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401110	Tortilla chips, nacho cheese flavor (Doritos)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401111	Tortilla chips, cool ranch flavor (Doritos)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401112	Tortilla chips, other flavors (Doritos)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401121	Tortilla chips, reduced fat, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401122	Tortilla chips, reduced fat, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54401170	Tortilla chips, low fat, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54402080	Tortilla chips, reduced sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54402200	Snack mix	Snack foods (21CFR 170.3(n)(37))	10	1	10
54402610	Potato chips, restructured, multigrain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403001	Popcorn, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403005	Popcorn, movie theater, with added butter	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403006	Popcorn, movie theater, no butter added	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403010	Popcorn, air-popped, no butter added	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403040	Popcorn, air-popped, with added butter	Snack foods (21CFR 170.3(n)(37))	10	1	10

54403045	Popcorn, popped in oil, no butter added	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403046	Popcorn, popped in oil, with added butter	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403051	Popcorn, microwave, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403052	Popcorn, microwave, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403053	Popcorn, microwave, plain, light	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403054	Popcorn, microwave, low sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403055	Popcorn, microwave, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403056	Popcorn, microwave, butter flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403057	Popcorn, microwave, flavored, light	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403058	Popcorn, microwave, cheese flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403059	Popcorn, microwave, kettle	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403061	Popcorn, microwave, kettle corn, light	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403062	Popcorn, microwave, other flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403080	Popcorn, ready-to-eat, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403081	Popcorn, ready-to-eat, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403082	Popcorn, ready-to-eat, plain, light	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403083	Popcorn, ready-to-eat, low sodium	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403084	Popcorn, ready-to-eat packaged, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403085	Popcorn, ready-to-eat, butter flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403086	Popcorn, ready-to-eat packaged, butter flavored, light	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403087	Popcorn, ready-to-eat, cheese flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403088	Popcorn, ready-to-eat, flavored, light	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403089	Popcorn, ready-to-eat, kettle	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403091	Popcorn, ready-to-eat packaged, kettle corn, light	Snack foods (21CFR 170.3(n)(37))	10	1	10

54403092	Popcorn, ready-to-eat packaged, other flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403110	Popcorn, caramel coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403120	Popcorn, caramel coated, with nuts	Snack foods (21CFR 170.3(n)(37))	10	1	10
54403160	Popcorn, chocolate coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54404000	Popcorn chips, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54404010	Popcorn chips, other flavors	Snack foods (21CFR 170.3(n)(37))	10	1	10
54404020	Popcorn chips, sweet flavors	Snack foods (21CFR 170.3(n)(37))	10	1	10
54406010	Onion flavored rings	Snack foods (21CFR 170.3(n)(37))	10	1	10
54406200	Shrimp chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408000	Pretzels, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408015	Pretzels, hard, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408016	Pretzels, hard, plain, salted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408017	Pretzels, hard, plain, lightly salted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408030	Pretzels, hard, plain, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408035	Pretzels, hard, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408070	Pretzels, hard, multigrain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408081	Pretzels, hard, plain, gluten free	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408082	Pretzels, hard, flavored, gluten free	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408105	Pretzel chips, hard, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408110	Pretzel chips, hard, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408115	Pretzel chips, hard, gluten free	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408190	Pretzels, hard, coated, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408200	Pretzels, hard, chocolate coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408210	Pretzels, hard, white chocolate coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408250	Pretzels, hard, yogurt coated	Snack foods (21CFR 170.3(n)(37))	10	1	10

54408260	Pretzels, hard, coated, gluten free	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408290	Pretzels, hard, filled, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408300	Pretzels, hard, cheese filled	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408310	Pretzels, hard, peanut butter filled	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408400	Pretzels, soft, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408405	Pretzels, soft, ready-to-eat, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408410	Pretzels, soft, ready-to-eat, salted, buttered	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408411	Pretzels, soft, ready-to-eat, unsalted, buttered	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408415	Pretzels, soft, ready-to-eat, salted, no butter	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408416	Pretzels, soft, ready-to-eat, unsalted, no butter	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408420	Pretzels, soft, ready-to-eat, cinnamon sugar coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408422	Pretzels, soft, ready-to-eat, coated or flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408430	Pretzels, soft, ready-to-eat, topped with meat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408432	Pretzels, soft, ready-to-eat, topped with cheese	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408450	Pretzels, soft, from frozen, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408455	Pretzels, soft, from frozen, salted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408456	Pretzels, soft, from frozen, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408460	Pretzels, soft, from frozen, cinnamon sugar coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408462	Pretzels, soft, from frozen, coated or flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408465	Pretzels, soft, from frozen, topped with meat	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408466	Pretzels, soft, from frozen, topped with cheese	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408470	Pretzels, soft, filled with cheese	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408475	Pretzels, soft, from school lunch	Snack foods (21CFR 170.3(n)(37))	10	1	10

54408480	Pretzels, soft, multigrain	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408485	Pretzels, soft, gluten free	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408486	Pretzels, soft, gluten free, cinnamon sugar coated	Snack foods (21CFR 170.3(n)(37))	10	1	10
54408487	Pretzels, soft, gluten free, coated or flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
54420210	Multigrain chips (Sun Chips)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54420220	Snack mix, plain (Chex Mix)	Snack foods (21CFR 170.3(n)(37))	10	1	10
54440020	Cracker chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
56104000	Pasta, vegetable, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56112000	Noodles, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56113000	Noodles, whole grain, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56113990	Noodles, vegetable, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56116990	Long rice noodles, made from mung beans, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56117090	Rice noodles, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56130000	Pasta, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56132990	Pasta, whole grain, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56140100	Pasta, gluten free	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200300	Cereal, cooked, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56200390	Barley, NS as to fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200400	Barley, no added fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200410	Barley	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200490	Buckwheat groats, NS as to fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200500	Buckwheat groats, no added fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200510	Buckwheat groats	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56200990	Grits, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

56201000	Grits, NS as to regular, quick, or instant, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201040	Grits, NS as to regular, quick, or instant, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201050	Grits, regular or quick, made with water, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201051	Grits, regular or quick, made with water, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201052	Grits, regular or quick, made with water, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201055	Grits, regular or quick, made with milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201056	Grits, regular or quick, made with milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201057	Grits, regular or quick, made with milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201065	Grits, regular or quick, made with non-dairy milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201066	Grits, regular or quick, made with non-dairy milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201067	Grits, regular or quick, made with non-dairy milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201090	Grits, with cheese, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201091	Grits, with cheese, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201092	Grits, with cheese, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201210	Grits, instant, made with water, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201220	Grits, instant, made with water, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201230	Grits, instant, made with water, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201340	Grits, instant, made with milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201342	Grits, instant, made with milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

56201344	Grits, instant, made with milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201350	Grits, instant, made with non-dairy milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201355	Grits, instant, made with non-dairy milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201360	Grits, instant, made with non-dairy milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201515	Cornmeal mush, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201516	Cornmeal mush, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201517	Cornmeal mush, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201540	Cornmeal, Puerto Rican Style	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201600	Masa harina, cooked	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56201990	Millet, NS as to fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56202000	Millet	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56202100	Millet, fat added	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56204000	Quinoa, NS as to fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56204005	Quinoa, no added fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56204010	Quinoa, fat added	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56205050	Cream of rice	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56205080	Rice, creamed, made with milk and sugar, Puerto Rican style	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56205090	Rice, cream of, cooked, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56205092	Rice, cream of, cooked, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56205094	Rice, cream of, cooked, made with milk	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56206990	Cream of wheat, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207000	Cream of wheat, NS as to regular, quick, or instant, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

56207005	Cream of wheat, NS as to regular, quick, or instant, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207015	Cream of wheat, regular or quick, made with water, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207016	Cream of wheat, regular or quick, made with water, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207017	Cream of wheat, regular or quick, made with water, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207021	Cream of wheat, regular or quick, made with milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207022	Cream of wheat, regular or quick, made with milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207023	Cream of wheat, regular or quick, made with milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207025	Cream of wheat, regular or quick, made with non-dairy milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207026	Cream of wheat, regular or quick, made with non-dairy milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207027	Cream of wheat, regular or quick, made with non-dairy milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207030	Cream of wheat, instant, made with water, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207050	Wheat, cream of, cooked, made with milk and sugar, Puerto Rican style	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207060	Cream of wheat, instant, made with water, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207070	Cream of wheat, instant, made with water, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207094	Cream of wheat, instant, made with milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207095	Cream of wheat, instant, made with milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

56207096	Cream of wheat, instant, made with milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207101	Cream of wheat, instant, made with non-dairy milk, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207102	Cream of wheat, instant, made with non-dairy milk, no added fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207103	Cream of wheat, instant, made with non-dairy milk, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207110	Bulgur, no added fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56207120	Bulgur, fat added	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56207130	Bulgur, NS as to fat	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56207160	Couscous, plain, cooked	Grain products & Pastas (21CFR 170.3(n)(23))	10	1	10
56207190	Whole wheat cereal, cooked, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207200	Whole wheat cereal, cooked	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207210	Whole wheat cereal, cooked, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56207370	Wheat cereal, chocolate flavored, cooked	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56208500	Oat bran cereal, cooked	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56208510	Oat bran cereal, cooked, fat added	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56208520	Oat bran cereal, cooked, NS as to fat	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
56209000	Cream of rye	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57000100	Cereal, oat, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57100100	Cereal, ready-to-eat, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57101000	Cereal (Kellogg's All-Bran)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57103000	Cereal (Post Alpha-Bits)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57103100	Cereal, O's, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57104000	Cereal (Kellogg's Apple Jacks)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57106050	Cereal (Post Great Grains Banana Nut Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57106060	Cereal (General Mills Cheerios Banana Nut)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57106260	Cereal (General Mills Cheerios Berry Burst)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57117000	Cereal (Quaker Cap'n Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57117500	Cereal (Quaker Christmas Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57119000	Cereal, crunch	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57120000	Cereal (Quaker Cap'n Crunch's Peanut Butter Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57123000	Cereal, O's, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57124030	Cereal (General Mills Chex Chocolate)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57124050	Cereal (General Mills Chex Cinnamon)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57124100	Cereal (General Mills Cheerios Chocolate)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57124200	Cereal, chocolate puffs	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57124300	Cereal (General Mills Lucky Charms Chocolate)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57125000	Cereal, cinnamon toast	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57125010	Cereal (General Mills 25% Less Sugar Cinnamon Toast Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57125900	Cereal (General Mills Honey Nut Clusters)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57126000	Cereal, chocolate crispy	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57127000	Cereal (Post Cocoa Pebbles)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57128000	Cereal (General Mills Cocoa Puffs)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57130000	Cereal (General Mills Cookie Crisp)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57132000	Cereal, corn squares	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57134000	Cereal, corn flakes, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57135000	Cereal (Kellogg's Corn Flakes)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57137000	Cereal, corn puffs	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57139000	Cereal (General Mills Count Chocula)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57143000	Cereal (Kellogg's Cracklin' Oat Bran)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57143500	Cereal (Post Great Grains, Cranberry Almond Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57148000	Cereal (Kellogg's Crispix)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57151000	Cereal, rice crispy, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57206700	Cereal (General Mills Fiber One)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57206710	Cereal (General Mills Fiber One Honey Clusters)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57206715	Cereal (General Mills Fiber One Raisin Bran Clusters)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57207000	Cereal, bran flakes, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57208000	Cereal (Kellogg's All-Bran Complete Wheat Flakes)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57209000	Cereal (Post Bran Flakes)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57211000	Cereal (General Mills Frankenberry)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57213000	Cereal (Kellogg's Froot Loops)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57213010	Cereal (Kellogg's Froot Loops Marshmallow)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57213850	Cereal (General Mills Cheerios Frosted)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57214000	Cereal, shredded wheat, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57216000	Cereal, rice crispy, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57221700	Cereal, fruit rings	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57221810	Cereal (General Mills Cheerios Fruity)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57223000	Cereal, fruit crispy	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57224000	Cereal (General Mills Golden Grahams)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57227000	Cereal, granola	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57228000	Granola, homemade	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57229000	Cereal (Kellogg's Low Fat Granola)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57230000	Cereal (Post Grape-Nuts)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57231200	Cereal (Post Great Grains Raisins, Dates, and Pecans)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57237100	Cereal, oat bunches	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57237200	Cereal (Post Honey Bunches of Oats with Vanilla Bunches)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57237300	Cereal (Post Honey Bunches of Oats with Almonds)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57238000	Cereal (Post Honeycomb)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57240100	Cereal, corn squares, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57241000	Cereal, O's, honey nut	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57241200	Cereal (Post Shredded Wheat Honey Nut)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57243000	Cereal (Kellogg's Honey Smacks)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57301500	Cereal (Kashi 7 Whole Grain Puffs)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57301505	Cereal (Kashi Autumn Wheat)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57301510	Cereal (Kashi GOLEAN)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57301511	Cereal (Kashi GOLEAN Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57301512	Cereal (Kashi GOLEAN Crunch Honey Almond Flax)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57301530	Cereal (Kashi Heart to Heart Honey Toasted Oat)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57301600	Cereal, multigrain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57303100	Cereal (General Mills Kix)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57303105	Cereal (General Mills Honey Kix)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57303200	Cereal (Kellogg's Krave)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57304100	Cereal, oat squares	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305100	Cereal (General Mills Lucky Charms)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305150	Cereal, frosted oats with marshmallows	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305160	Cereal (Malt-O-Meal Blueberry Muffin Tops)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305165	Cereal (Malt-O-Meal Cinnamon Toasters)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305170	Cereal (Malt-O-Meal Coco-Roos)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305174	Cereal (Malt-O-Meal Colossal Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305175	Cereal (Malt-O-Meal Cocoa Dyno-Bites)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305180	Cereal (Malt-O-Meal Corn Bursts)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305210	Cereal (Malt-O-Meal Frosted Flakes)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57305300	Cereal (Malt-O-Meal Fruity Dyno-Bites)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305400	Cereal (Malt-O-Meal Honey Graham Squares)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305500	Cereal (Malt-O-Meal Honey Nut Toasty O's)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57305600	Cereal (Malt-O-Meal Marshmallow Mateys)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57306500	Cereal (Malt-O-Meal Golden Puffs)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57306700	Cereal (Malt-O-Meal Toasted Oat Cereal)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57306800	Cereal (Malt-O-Meal Tootie Fruities)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57308190	Cereal, muesli	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57308400	Cereal, O's, multigrain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57309100	Cereal (Nature Valley Granola)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57316380	Cereal (General Mills Cheerios Oat Cluster Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57316385	Cereal (General Mills Cheerios Protein)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57316450	Cereal (General Mills Oatmeal Crisp with Almonds)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57316710	Cereal (Quaker Honey Graham Oh's)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57320500	Cereal (Quaker Granola with Oats, Honey, and Raisins)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57321900	Cereal (Nature's Path Organic Flax Plus)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57326000	Cereal (Barbara's Puffins)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57327450	Cereal (Quaker Toasted Oat Bran)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57327500	Cereal (Quaker Oatmeal Squares)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57329000	Cereal, bran flakes, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57330000	Cereal (Kellogg's Raisin Bran)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57330010	Cereal (Kellogg's Raisin Bran Crunch)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57331000	Cereal (Post Raisin Bran)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57332100	Cereal (General Mills Raisin Nut Bran)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57335550	Cereal (General Mills Reese's Puffs)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57336000	Cereal, rice squares	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57337000	Cereal, rice flakes	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57339000	Cereal (Kellogg's Rice Krispies)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57339500	Cereal (Kellogg's Rice Krispies Treats Cereal)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57340000	Cereal, puffed rice	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57341200	Cereal (Kellogg's Smart Start Strong)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57341300	Cereal (Kellogg's Smorz)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57344000	Cereal, K's, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57344001	Cereal (Kellogg's Special K Blueberry)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57344005	Cereal (Kellogg's Special K Chocolatey Delight)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57344010	Cereal, K's, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57344015	Cereal (Kellogg's Special K Fruit & Yogurt)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57344020	Cereal (Kellogg's Special K Vanilla Almond)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57344025	Cereal (Kellogg's Special K Cinnamon Pecan)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57347000	Cereal, flavored puffs	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57348000	Cereal, corn flakes, flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57349000	Cereal (Kellogg's Frosted Flakes)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57355000	Cereal (Post Golden Crisp)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57401100	Cereal, O's, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57407100	Cereal (General Mills Trix)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57408100	Cereal (Uncle Sam)	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57411000	Cereal, wheat squares	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57416000	Cereal, plain puffs	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10

57416010	Cereal, puffed wheat, sweetened	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57417000	Cereal, shredded wheat, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57418000	Cereal, wheat flakes	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420100	Cereal, other, NFS	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420110	Cereal, other, plain	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420120	Cereal, other, fruit flavored	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420130	Cereal, other, chocolate	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420140	Cereal, other, peanut butter	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420150	Cereal, other, honey	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
57420160	Cereal, reduced sugar	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
58145110	Macaroni or noodles with cheese	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145111	Macaroni or noodles with cheese, from restaurant	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145112	Macaroni or noodles with cheese, made from packaged mix	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145113	Macaroni or noodles with cheese, canned	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145117	Macaroni or noodles with cheese, Easy Mac type	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145119	Macaroni or noodles with cheese, made from reduced fat packaged mix	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145120	Macaroni or noodles with cheese and tuna	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145135	Macaroni or noodles with cheese and meat	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10

58145136	Macaroni or noodles with cheese and meat, prepared from Hamburger Helper mix	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145140	Macaroni or noodles with cheese and tomato	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145160	Macaroni or noodles with cheese and frankfurters or hot dogs	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145170	Macaroni or noodles with cheese and egg	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145190	Macaroni or noodles with cheese and chicken or turkey	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58145300	Macaroni or noodles with cheese, whole grain	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58147330	Macaroni or noodles, creamed, with cheese	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58147340	Macaroni or noodles, creamed, with cheese and tuna	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58155410	Soupy rice with chicken, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58155510	Soupy rice mixture with chicken and potatoes, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58174000	Upma	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
58302000	Macaroni and cheese, diet frozen meal	Grain products & Pastas (21CFR 170.3(n)(23))	4.3	0.43	10
58400000	Soup, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58400100	Noodle soup, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58400200	Rice soup, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58401010	Barley soup, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58401200	Barley soup, sweet, with or without nuts, Asian Style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58402010	Beef noodle soup, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58402020	Beef dumpling soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58402030	Beef rice soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

58403010	Chicken or turkey noodle soup, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58403050	Chicken or turkey noodle soup, cream of, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58403060	Chicken or turkey noodle soup, reduced sodium, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58403100	Noodle and potato soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404010	Chicken or turkey rice soup, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404040	Chicken or turkey rice soup, reduced sodium, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404050	Chicken or turkey rice soup, reduced sodium, canned, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404100	Rice and potato soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404500	Matzo ball soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404510	Chicken or turkey soup with dumplings and potatoes, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58404520	Chicken or turkey soup with dumplings, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58407010	Instant soup, noodle	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58407030	Soup, mostly noodles	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58407035	Soup, mostly noodles, reduced sodium	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58407050	Instant soup, noodle with egg, shrimp or chicken	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58408010	Wonton soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58408500	Noodle soup with vegetables, Asian style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
58409000	Noodle soup, with fish ball, shrimp, and dark green leafy vegetable	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

58421000	Sopa seca, Mexican style, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
59003000	Meat substitute, cereal- and vegetable protein-based, fried	Plant protein products (21CFR 170.3(n)(33))	20	1	20
61101200	Grapefruit, canned	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
61113500	Lemon pie filling	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
61122300	Orange, canned, NFS	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
61122320	Orange, canned, juice pack	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
61122330	Orange, canned, in syrup	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
61201020	Grapefruit juice, 100%, NS as to form	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61201220	Grapefruit juice, 100%, canned, bottled or in a carton	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61201225	Grapefruit juice, 100%, with calcium added	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61201620	Grapefruit juice,100%, frozen, reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61210000	Orange juice, 100%, NFS	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61210220	Orange juice, 100%, canned, bottled or in a carton	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61210250	Orange juice, 100%, with calcium added, canned, bottled or in a carton	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61210620	Orange juice, 100%, frozen, reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61210720	Orange juice, 100%, frozen, not reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61210820	Orange juice, 100%, with calcium added, frozen, reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

61213220	Tangerine juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61213800	Fruit juice blend, citrus, 100% juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
61213900	Fruit juice blend, citrus, 100% juice, with calcium added	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
63101210	Apple pie filling	Gelatins, Puddings, & Fillings (21CFR 170.3(n)(22))	10	1	10
63103110	Apricot, canned	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
63113030	Cherry pie filling	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
63115110	Cherries, canned	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
63143110	Plum, canned	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
63203110	Bluberries, canned	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
63203700	Blueberry pie filling	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
63223110	Strawberries, canned	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	5	1	5
63415100	Soup, fruit	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
64100100	Fruit juice, NFS	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64100110	Fruit juice blend, 100% juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64100200	Cranberry juice blend, 100% juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64100220	Cranberry juice blend, 100% juice, with calcium added	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64101010	Apple cider	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

64104010	Apple juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64104030	Apple juice, 100%, with calcium added	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64104600	Blackberry juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64104610	Blueberry juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64105400	Cranberry juice, 100%, not a blend	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64116020	Grape juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64116060	Grape juice, 100%, with calcium added	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64120010	Papaya juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64121000	Passion fruit juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64124020	Pineapple juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64126000	Pomegranate juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64132010	Prune juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64132500	Strawberry juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64133100	Watermelon juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64200100	Fruit nectar, NFS	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64201010	Apricot nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

64201500	Banana nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64202010	Cantaloupe nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64203020	Guava nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64204010	Mango nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64205010	Peach nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64210010	Papaya nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64213010	Passion fruit nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64215010	Pear nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
64221010	Soursop, nectar	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
71200010	Potato chips, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200100	Potato chips, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200110	Potato chips, barbecue flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200120	Potato chips, sour cream and onion flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200130	Potato chips, cheese flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200140	Potato chips, other flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200200	Potato chips, ruffled, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200210	Potato chips, ruffled, barbecue flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200220	Potato chips, ruffled, sour cream and onion flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200230	Potato chips, ruffled, cheese flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200240	Potato chips, ruffled, other flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10

71200300	Potato chips, restructured, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200310	Potato chips, restructured, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200400	Potato chips, baked, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
71200410	Potato chips, baked, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71201050	Potato chips, reduced fat	Snack foods (21CFR 170.3(n)(37))	10	1	10
71201060	Potato chips, fat free	Snack foods (21CFR 170.3(n)(37))	10	1	10
71201200	Potato chips, restructured, reduced fat, lightly salted	Snack foods (21CFR 170.3(n)(37))	10	1	10
71201210	Potato chips, restructured, fat free	Snack foods (21CFR 170.3(n)(37))	10	1	10
71202000	Potato chips, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
71202100	Potato chips, reduced fat, unsalted	Snack foods (21CFR 170.3(n)(37))	10	1	10
71202500	Potato chips, lightly salted	Snack foods (21CFR 170.3(n)(37))	10	1	10
71202510	Potato chips, restructured, lightly salted	Snack foods (21CFR 170.3(n)(37))	10	1	10
71203010	Potato chips, popped, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
71203020	Potato chips, popped, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71203030	Potato chips, popped, NFS	Snack foods (21CFR 170.3(n)(37))	10	1	10
71205020	Potato sticks, plain	Snack foods (21CFR 170.3(n)(37))	10	1	10
71205030	Potato sticks, flavored	Snack foods (21CFR 170.3(n)(37))	10	1	10
71205040	Potato sticks, fry shaped	Snack foods (21CFR 170.3(n)(37))	10	1	10
71220000	Vegetable chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
71801000	Potato soup, NS as to made with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
71801010	Potato soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
71801020	Potato soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
71801100	Potato and cheese soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
71803010	Potato chowder	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

71851010	Plantain soup, Puerto Rican style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
71905410	Plantain chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
71980200	Taro chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
72302000	Broccoli soup, prepared with milk, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
72302020	Broccoli soup, prepared with water, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
72302100	Broccoli cheese soup, prepared with milk, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
72306000	Watercress broth with shrimp	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
72307000	Spinach soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
72308000	Dark-green leafy vegetable soup with meat, Asian style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
72308500	Dark-green leafy vegetable soup, meatless, Asian style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
73105000	Beet juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
73105010	Carrot juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
73410210	Sweet potato chips	Snack foods (21CFR 170.3(n)(37))	10	1	10
73501000	Carrot soup, cream of, prepared with milk, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
73501010	Carrot with rice soup, cream of, prepared with milk, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
73502000	Squash, winter type, soup, home recipe, canned, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74301100	Tomato juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

74301150	Tomato juice, 100%, low sodium	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
74302000	Tomato juice cocktail	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
74303000	Tomato and vegetable juice, 100%	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
74303100	Tomato and vegetable juice, 100%, low sodium	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
74601000	Tomato soup, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74601010	Tomato soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74602010	Tomato soup, prepared with water, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74602050	Tomato soup, instant type, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74602200	Tomato soup, canned, reduced sodium, prepared with water, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74602300	Tomato soup, canned, reduced sodium, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74603010	Tomato beef soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74604010	Tomato beef noodle soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74604100	Tomato beef rice soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74604500	Tomato noodle soup, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74604600	Tomato noodle soup, canned, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74605010	Tomato rice soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74606010	Tomato vegetable soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
74606020	Tomato vegetable soup with noodles, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

75132000	Mixed vegetable juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
75132100	Celery juice	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
75200700	Aloe vera juice drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
75217520	Hominy, cooked	Breakfast cereals (21CFR 170.3(n)(4))	10	1	10
75600150	Soup, cream of, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601000	Asparagus soup, cream of, NS as to made with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601010	Asparagus soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601020	Asparagus soup, cream of, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601100	Borscht	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601200	Cabbage soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601210	Cabbage with meat soup, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75601250	Kimchi soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75603010	Celery soup, cream of, prepared with milk, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75603020	Celery soup, cream of, prepared with water, home recipe, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75604010	Corn soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75604020	Corn soup, cream of, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75604600	Gazpacho	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75605010	Leek soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607000	Mushroom soup, NFS	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607010	Mushroom soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

75607020	Mushroom soup, cream of, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607040	Mushroom soup, with meat broth, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607050	Mushroom soup, cream of, low sodium, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607060	Mushroom soup, cream of, NS as to made with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607080	Mushroom with chicken soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607090	Mushroom soup, cream of, canned, reduced sodium, NS as to made with milk or water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607100	Mushroom soup, cream of, canned, reduced sodium, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75607140	Mushroom soup, cream of, canned, reduced sodium, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75608010	Onion soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75608100	Onion soup, French	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75608200	Onion soup, made from dry mix	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75609010	Pea soup, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75611010	Vegetable soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75612010	Zucchini soup, cream of, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75646010	Shav soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75647000	Seaweed soup	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75649010	Vegetable soup, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75649040	Vegetable soup, reduced sodium, canned, ready to serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75649050	Vegetable soup, made from dry mix	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5

75650990	Minestrone soup, reduced sodium, canned or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651010	Minestrone soup, canned, prepared with water, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651020	Vegetable beef soup, canned, prepared with water, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651030	Vegetable beef noodle soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651040	Vegetable noodle soup, canned, prepared with water, or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651070	Vegetable rice soup, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651080	Vegetable beef soup with rice, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651110	Vegetable chicken rice soup, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75651150	Vegetable noodle soup, reduced sodium, canned, prepared with water or ready-to-serve	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75652030	Vegetable beef soup, canned, prepared with milk	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75654010	Vegetarian vegetable soup, prepared with water	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75656010	Vegetable soup, Spanish style, stew type	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75656020	Vegetable soup, chunky style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75656040	Vegetable soup, with pasta, chunky style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75656060	Vegetable beef soup, chunky style	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
75657000	Vegetable broth, bouillon	Soups & Soup mixes (21CFR 170.3(n)(40))	5	1	5
78101000	Vegetable and fruit juice, 100% juice, with high vitamin C	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

81301000	Garlic sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
81301020	Lemon-butter sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
81302010	Hollandaise sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
81308200	Sauce, NFS	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
81312100	Curry sauce	Gravies & Sauces (21CFR 170.3(n)(24))	5	1	5
83100100	Salad dressing, NFS, for salads	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83101000	Blue or roquefort cheese dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83101600	Bacon and tomato dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83102000	Caesar dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83103000	Coleslaw dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83104000	French or Catalina dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83105500	Honey mustard dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83106000	Italian dressing, made with vinegar and oil	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83109000	Russian dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83112000	Avocado dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83112400	Creamy Italian dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83112500	Creamy dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83112950	Poppy seed dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83112990	Sesame dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83113500	Ranch dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83114000	Thousand Island dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83115000	Yogurt dressing	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83200100	Salad dressing, light, NFS	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83201000	Blue or roquefort cheese dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83201400	Coleslaw dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5

83201500	Creamy Italian dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83202020	French or Catalina dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83203000	Caesar dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83204500	Honey mustard dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83205450	Italian dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83205560	Ranch dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83206000	Russian dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83206500	Sesame dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83207000	Thousand Island dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83208500	Korean dressing or marinade	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83210100	Creamy dressing, light	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300100	Blue or roquefort cheese dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300200	Caesar dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300250	Creamy Italian dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300300	Creamy dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300400	French or Catalina dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300500	Honey mustard dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300600	Italian dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300750	Ranch dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300800	Russian dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83300900	Salad dressing, fat free, NFS	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
83301000	Thousand Island dressing, fat free	Fats & Oils (21CFR 170.3(n)(12))	5	1	5
91300010	Syrup, NFS	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91301510	Pancake syrup, light	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10

91304010	Topping, butterscotch or caramel	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91304020	Topping, chocolate	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91304030	Topping, fruit	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91304040	Topping, marshmallow	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91304060	Topping, nuts and syrup	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91361040	Dessert sauce	Sweet sauces, Toppings & Syrups (21CFR 170.3(n)(43))	10	1	10
91700500	M&M's Almond Chocolate Candies	Soft candy (21CFR 170.3(n)(38))	10	1	10
91701010	Almonds, chocolate covered candy	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703040	Caramel candy, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703050	Caramel with nuts and cereal, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703060	Caramel with nuts, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703070	Rolo	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703150	Toblerone, milk chocolate with honey and almond nougat	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703200	TWIX Caramel Cookie Bars	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703250	TWIX Chocolate Fudge Cookie Bars	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703300	TWIX Peanut Butter Cookie Bars	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703400	Whatchamacallit	Soft candy (21CFR 170.3(n)(38))	10	1	10
91703600	Espresso coffee beans, chocolate-covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705005	Chocolate candy, other, NFS	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705010	Chocolate candy	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705012	Chocolate candy with nuts, other, NFS	Soft candy (21CFR 170.3(n)(38))	10	1	10

91705015	Chocolate candy with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705020	Chocolate candy with cereal	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705030	Kit Kat	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705040	Chocolate, milk, with nuts, not almond or peanuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705050	Milk chocolate candy, with fruit and nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705060	Milk chocolate candy, with almonds	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705070	Chocolate, milk, with peanuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705080	Chocolate candy, cookie filled	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705090	Chocolate candy with fondant and caramel	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705200	Chocolate chips	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705290	Dark chocolate candy, other, NFS	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705300	Dark chocolate candy	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705310	Chocolate, sweet or dark, with almonds	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705312	Dark chocolate candy with nuts, other, NFS	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705315	Dark chocolate candy with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705440	Chocolate candy, fudge	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705450	Chocolate candy, caramel filled	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705460	Chocolate candy, caramel filled with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705470	Chocolate candy, coconut filled	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705480	Chocolate candy, cream filled	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705500	Mexican chocolate, tablet	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705510	Chocolate candy, nougat filled	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705520	Chocolate candy, nougat filled with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91705530	Chocolate candy, peanut butter filled	Soft candy (21CFR 170.3(n)(38))	10	1	10

91705550	Chocolate candy with dried fruit	Soft candy (21CFR 170.3(n)(38))	10	1	10
91706000	Coconut candy, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91706010	Chocolate candy, sugar free	Soft candy (21CFR 170.3(n)(38))	10	1	10
91707010	Fondant, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91709000	Gumdrops, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91713010	Fudge, chocolate, chocolate-coated	Soft candy (21CFR 170.3(n)(38))	10	1	10
91713020	Fudge, chocolate, chocolate-coated, with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91713030	Fudge, chocolate	Soft candy (21CFR 170.3(n)(38))	10	1	10
91713040	Fudge, chocolate, with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91715000	Fudge, caramel and nut, chocolate-coated candy	Soft candy (21CFR 170.3(n)(38))	10	1	10
91715100	SNICKERS Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91715200	Baby Ruth	Soft candy (21CFR 170.3(n)(38))	10	1	10
91715300	100 GRAND Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91716110	Halvah, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91718050	Honey-combed hard candy with peanut butter, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91718100	Butterfinger	Soft candy (21CFR 170.3(n)(38))	10	1	10
91718110	Butterfinger Crisp	Soft candy (21CFR 170.3(n)(38))	10	1	10
91718200	Chocolate-flavored sprinkles	Soft candy (21CFR 170.3(n)(38))	10	1	10
91723010	Marshmallow, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91726110	Nougat, with caramel, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91726130	MILKY WAY Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91726140	MILKY WAY MIDNIGHT Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91726150	MARS Almond Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91726410	Nougat, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10

91726420	3 MUSKETEERS Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91726425	3 Musketeers Truffle Crisp Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91727010	Nuts, chocolate covered, not almonds or peanuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91731000	Peanuts, chocolate covered candy	Soft candy (21CFR 170.3(n)(38))	10	1	10
91731010	M&M's Peanut Chocolate Candies	Soft candy (21CFR 170.3(n)(38))	10	1	10
91731060	M&M's Peanut Butter Chocolate Candies	Soft candy (21CFR 170.3(n)(38))	10	1	10
91733200	Peanut Bar, chocolate covered candy	Soft candy (21CFR 170.3(n)(38))	10	1	10
91734000	Peanut butter, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91734100	Reese's Peanut Butter Cup	Soft candy (21CFR 170.3(n)(38))	10	1	10
91734300	Reese's Sticks	Soft candy (21CFR 170.3(n)(38))	10	1	10
91734400	Reese's Fast Break	Soft candy (21CFR 170.3(n)(38))	10	1	10
91734450	Reese's Crispy Crunchy Bar	Soft candy (21CFR 170.3(n)(38))	10	1	10
91739010	Raisins, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91746010	Sugar-coated chocolate discs	Soft candy (21CFR 170.3(n)(38))	10	1	10
91746100	Chocolate candy, candy shell	Soft candy (21CFR 170.3(n)(38))	10	1	10
91746110	Chocolate candy, candy shell with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91746120	Sixlets	Soft candy (21CFR 170.3(n)(38))	10	1	10
91746150	Easter egg, candy coated chocolate	Soft candy (21CFR 170.3(n)(38))	10	1	10
91746200	M&M's Pretzel Chocolate Candies	Soft candy (21CFR 170.3(n)(38))	10	1	10
91760100	Toffee, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
91760200	Toffee, chocolate-coated, with nuts	Soft candy (21CFR 170.3(n)(38))	10	1	10
91760500	Truffles	Soft candy (21CFR 170.3(n)(38))	10	1	10
91770030	Dietetic or low calorie candy, chocolate covered	Soft candy (21CFR 170.3(n)(38))	10	1	10
92400000	Soft drink, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92400100	Soft drink, NFS, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1

92410310	Soft drink, cola	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410315	Soft drink, cola, reduced sugar	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410320	Soft drink, cola, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410340	Soft drink, cola, decaffeinated	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410350	Soft drink, cola, decaffeinated, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410360	Soft drink, pepper type	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410370	Soft drink, pepper type, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410390	Soft drink, pepper type, decaffeinated	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410400	Soft drink, pepper type, decaffeinated, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410410	Soft drink, cream soda	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410420	Soft drink, cream soda, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410510	Soft drink, fruit flavored, caffeine free	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410520	Soft drink, fruit flavored, diet, caffeine free	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410550	Soft drink, fruit flavored, caffeine containing	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410560	Soft drink, fruit flavored, caffeine containing, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410610	Soft drink, ginger ale	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410620	Soft drink, ginger ale, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410710	Soft drink, root beer	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410720	Soft drink, root beer, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410810	Soft drink, chocolate flavored	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92410820	Soft drink, chocolate flavored, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92411510	Soft drink, cola, fruit or vanilla flavored	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92411520	Soft drink, cola, chocolate flavored	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92411610	Soft drink, cola, fruit or vanilla flavored, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
92411620	Soft drink, cola, chocolate flavored, diet	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1

92432000	Fruit juice drink, citrus, carbonated	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92433000	Fruit juice drink, noncitrus, carbonated	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92510610	Fruit juice drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92510650	Tamarind drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92510720	Fruit punch, made with fruit juice and soda	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92510730	Fruit punch, made with soda, fruit juice, and sherbet or ice cream	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92510955	Lemonade, fruit juice drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92510960	Lemonade, fruit flavored drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92511000	Lemonade, frozen concentrate, not reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92511015	Fruit flavored drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92511250	Fruit juice beverage, 40-50% juice, citrus	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92512090	Pina Colada, nonalcoholic	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92512110	Margarita mix, nonalcoholic	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92513000	Slush frozen drink	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92530410	Fruit flavored drink, with high vitamin C	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92530510	Cranberry juice drink, with high vitamin C	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

92530610	Fruit juice drink, with high vitamin C	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92530950	Vegetable and fruit juice drink, with high vitamin C	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92531030	Fruit juice drink (Sunny D)	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92541010	Fruit flavored drink, powdered, reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92542000	Fruit flavored drink, with high vitamin C, powdered, reconstituted	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550030	Fruit juice drink, with high vitamin C, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550035	Fruit juice drink, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550040	Fruit juice drink, diet	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550110	Cranberry juice drink, with high vitamin C, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550200	Grape juice drink, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550350	Orange juice beverage, 40-50% juice, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550360	Apple juice beverage, 40-50% juice, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550370	Lemonade, fruit juice drink, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550380	Pomegranate juice beverage, 40-50% juice, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92550405	Vegetable and fruit juice drink, with high vitamin C, light	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92552020	Fruit juice drink, reduced sugar (Sunny D)	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

92552030	Fruit juice drink (Capri Sun)	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92582100	Fruit juice drink, with high vitamin C, plus added calcium	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92582110	Fruit juice drink, added calcium (Sunny D)	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92612010	Sugar cane beverage	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92801000	Wine, nonalcoholic	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92802000	Wine, light, nonalcoholic	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92803000	Nonalcoholic malt beverage	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92804000	Shirley Temple	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25
92900300	Sports drink, dry concentrate, not reconstituted	Beverages & Beverage bases (21CFR 170.3(n)(3))	6.25	1	6.25
95201000	Nutritional powder mix (Carnation Instant Breakfast)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95201010	Nutritional powder mix, sugar free (Carnation Instant Breakfast)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95201200	Nutritional powder mix (EAS Whey Protein Powder)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95201300	Nutritional powder mix (EAS Soy Protein Powder)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95201500	Nutritional powder mix, high protein (Herbalife)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95201600	Nutritional powder mix (Isopure)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95201700	Nutritional powder mix (Kellogg's Special K20 Protein Water)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95202000	Nutritional powder mix (Muscle Milk)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95202010	Nutritional powder mix, light (Muscle Milk)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1

95210000	Nutritional powder mix (Slim Fast)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95210010	Nutritional powder mix, sugar free (Slim Fast)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95210020	Nutritional powder mix, high protein (Slim Fast)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95220000	Nutritional powder mix, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95220010	Nutritional powder mix, high protein, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95230000	Nutritional powder mix, whey based, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95230010	Nutritional powder mix, protein, soy based, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95230020	Nutritional powder mix, protein, light, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95230030	Nutritional powder mix, protein, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310200	Energy drink (Full Throttle)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310400	Energy drink (Monster)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310500	Energy drink (Mountain Dew AMP)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310550	Energy drink (No Fear)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310555	Energy drink (No Fear Motherload)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310560	Energy drink (NOS)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310600	Energy drink (Red Bull)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310700	Energy drink (Rockstar)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310750	Energy drink (SoBe Energize Energy Juice Drink)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95310800	Energy drink (Vault)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95311000	Energy Drink	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312400	Energy drink, low calorie (Monster)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312410	Energy drink, sugar free (Monster)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312500	Energy drink, sugar free (Mountain Dew AMP)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312550	Energy drink, sugar free (No Fear)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1

95312555	Energy drink, sugar-free (NOS)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312560	Energy drink (Ocean Spray Cran-Energy Juice Drink)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312600	Energy drink, sugar-free (Red Bull)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312700	Energy drink, sugar free (Rockstar)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312800	Energy drink, sugar free (Vault)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312900	Energy drink (XS)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95312905	Energy drink (XS Gold Plus)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95313200	Energy drink, sugar free	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95320200	Sports drink (Gatorade G)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95320500	Sports drink (Powerade)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95321000	Sports drink, NFS	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95322200	Sports drink, low calorie (Gatorade G2)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95322500	Sports drink, low calorie (Powerade Zero)	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95323000	Sports drink, low calorie	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95330100	Fluid replacement, electrolyte solution	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95330500	Fluid replacement, 5% glucose in water	Beverages & Beverage bases (21CFR 170.3(n)(3))	4.1	1	4.1
95342000	Fruit juice, acai blend	Processed fruits & Fruit juices (21CFR 170.3(n)(35))	6.25	1	6.25

Appendix 4. Regulatory Applications and Reviews of Duckweed/Water Lentils and Water Lentil Protein Concentrates

EFSA

Novel Food Catalogue Entries

Novel food catalogue (europa.eu)

Within the EU Novel Food Catalogue:
Lemna minor

Common Names
Common duckweed (EN), klein eendekroos (NL), rzęsa drobna (PL), pikkulimaska (FI), kleine Wasserlinse (DE), väike lemmel (ET), okřehek menší (CZ), apró békalencse (HU), νεροφακή (EL), liden andemad (DK), Mazais ūdenszieds (LV), vodna leča (SL), andmat (SE), Lentilha-de-Água (PT)

Description
The surface floating macrophyte duckweed is an aquatic plant belonging to the family of Lemniaceae. According to information available to Member States' competent authorities, the request only concerns traditional herbal infusions on the basis of wine and bee honey prepared with Lemna minor used as food supplements and intended to be consumed as such. Such use is considered as not novel. Any other food uses of this product have to be authorised pursuant to the requirements of Regulation (EU)2015/2283.

Novel Food Submissions

Summary of applications and notifications (europa.eu)
As of July 21, 2022, there has been one submission notifying use of Wolffia as a traditional food in a non-EU country and four novel food submissions related to duckweeds and protein concentrations from duckweeds. These five submissions and their status are described below.

1. Fresh Wolffia as a traditional food from a third country by GreenOnyx Ltd. (Israel)

Application summary found at: novel-food_sum_ongoing-not_2020-2033.pdf (europa.eu)

Applicant: GreenOnyx Ltd., Sderot HaHaskala 9, Tel Aviv-Yafo, Israel 6789009

"This is a notification for the authorisation to place on the EU market the following traditional food from a third country: fresh Wolffia. The notification has been compiled in line with the administrative and scientific requirements of Commission Implementing Regulation (EU) 2017/2468 for notifications concerning traditional foods from third countries in accordance with Regulation (EU) 2015/2283 of the European Parliament and of the Council. It is also in line with the European Food Safety Authority (EFSA) guidance on the preparation and presentation of the notification and application for authorisation of

traditional foods from third countries in the context of Regulation (EU) 2015/2283. GreenOnyx (GO) Wolffia is the product name for the plant genus Wolffia (known locally in Thailand as Khai nam) and is an edible food from the duckweed family. Wolffia has a long history of being used as a source of food by humans and Wolffia arrhiza and Wolffia globosa are the dominating species of duckweed used for human consumption. Traditionally, these plant species are cultivated in season in local aquatic farms in countries in Asia, including Myanmar (Burma), Laos and Thailand and is grown in small local open ponds that require intensive management and with inability to commercially scale as a result of uncontrolled contamination risks (pollutants and microorganisms) and high level of cultivation instability. GO Wolffia is cultivated in a controlled closed system for continuous safe and stable generation of the Wolffia biomass in an indoor aquatic vertical farm. This farm implements the traditional farm growing conditions of GO Wolffia in an optimal and safe level under closed and controlled environmental conditions. The composition of the nutrients added to the water is tightly controlled, and prevents contamination of the plants with heavy metals, pesticides or other undesired contaminants. The GO Wolffia plants were collected from natural habitats and were not manipulated or modified, thus are similar to the plants that are being used in traditional farms. But unlike traditional farms, the GreenOnyx's Wolffa cultures are free of any pollutions or chemical hazards, are pathogen-free, secured and stable year-round under the controlled cultivation. GO Wolffia, which is to be placed on the market in the EU as a traditional novel food, will be delivered as a fresh vegetable (freshly packed). Similar to other fresh green leafy vegetables, GO Wolffia may be consumed as food in the form of the whole fresh plant, in the form of grounded or cooked vegetable and be added as an ingredient in many food and drink categories. This notification is supported by a number of references documenting the traditional history of consumption of this traditional food and its safety of use."

Technical report issues on May 2021, "Considering these data, EFSA does not raise safety objections to the placing on the market of the TF (fresh plants of Wolffia arrhiza and Wolffia globosa) within the EU"

EFSA (European Food Safety Authority), 2021. Technical Report on the notification of fresh plants of Wolffia arrhiza and Wolffia globosa as a traditional food from a third country pursuant to Article 14 of Regulation (EU) 2015/2283. EFSA supporting publication 2021:EN-6658. 15 pp. doi:10.2903/sp.efsa.2021.EN-6658

2. Water lentil powder from Lemnaceae by Parabel

Application summary found at: novel-food_sum_ongoing-app_2018-0430.pdf (europa.eu)

Applicant: Parabel Ltd, 7898 Headwaters Commerce Street, Fellsmere, Florida, U.S.A.

"The application concerns request for authorisation of water lentil powder as novel food. The Water lentil powder is derived from controlled cultivated members of the Lemnaceae family (whole plant), commonly known as water lentils or duckweed.

Parabel has developed a proprietary growth and processing technique to produce a food ingredient derived 100% from an aquatic plant in the Lemnaceae family (water lentils).

The subject of this submission is manufactured by a mild and minimally processed technology consisting of a thermal washing system, that is further dried and milled; no processing chemicals and food additives are added to the process.
Parabel's water lentil powder is intended for use as a multipurpose food ingredient, particularly as a source of dietary protein, fibre, essential fatty acids and energy.

A typical analysis shows that the novel food consists of 35-55% protein, 30-50% total dietary fibre, 6-12% fat, <10% minerals, and <10% moisture (as-is).
Intended uses include baked goods and baking mixes, beverages and beverage bases, breakfast cereals, fresh fruits and fruit juices, frozen dairy desserts and mixes, grain products and pastas, meat products and analogues, dairy products and analogues, plant protein products, processed fruits and fruit juices, processed vegetables and vegetable juices, snack foods, soft candy, and soups and soup mixes at a proposed ADI of 2g LC/ kg bw/day.

The information and data provided by Parabel on the novel food in this application, supplemented by the publicly available data from animal feeding studies of Parabel products and water lentils, as well as by the requirements for dietary protein and fibre in humans, provide sufficient basis for an assessment of the safety of Parabel's water lentil powder for the proposed use as an ingredient in human food when prepared according to appropriate specifications and used according to cGMP."

In September 2021, The EFSA Panel on Nutrition, Novel Foods and Food Allergens issued a scientific opinion on this application. "The Panel concluded that an increase in manganese intake from the NF [Novel Food] used as food ingredient or food supplements is of safety concern and the safety of the NF cannot be established". Reference at: EFSA NDA Panel (EFSA Panel on Nutrition, Novel Foods and Food Allergens), Turck D, Bohn T, Castenmiller J, De Henauw S, Hirsch-Ernst KI, Maciuk A, Mangelsdorf I, McArdle HJ, Naska A, Pelaez C, Pentieva K, Siani A, Thies F, Tsabouri S, Vinceti M, Cubadda F, Frenzel T, Heinonen M, Prieto Maradona M, Marchelli R, Neuhauser-Berthold M, Poulsen M, Schlatter JR, van Loveren H, € Kouloura E, Steinkellner H and Knutsen HK, 2021. Scientific Opinion on the safety of water lentil powder from Lemnaceae as a Novel Food pursuant to Regulation (EU) 2015/2283. EFSA Journal 2021;19(11):6845, 25 pp. https://doi.org/10.2903/j.efsa.2021.6845

3. Wolffia globosa 'Mankai' powder by Hinoman

Application summary found at: novel-food_sum_ongoing-app_2019-1223.pdf (europa.eu)

Applicant: Hinoman, 2 Nim Av. Rishon LeZion, 75141, Israel

"This dossier concerns a Novel Food approval for Wolffia globosa 'Mankai' powder (Mankai™ D110). Fresh Mankai™ is a cultivated strain of Lemnaceae-aquatic plants that float on the surface of slow-moving bodies of water, known commonly, in English, as Asian Watermeal and is part of the Lemnaceae family, commonly known as Duckweed. Fresh Mankai™ is grown in cultivation basins and the growth is done under closed-controlled green-house conditions. Continuous growth and harvesting is carried out in a semi/fully automated process. The production process of both fresh Mankai™ and Mankai™ D110 (a dried form), comply with the standards of Quality Management of FSSC 22000 and ISO 9001. The specifications of Mankai™ D110 are detailed in this document and are in accordance with European standards and regulations. Mankai™ D110 contains a high level of protein (40-48%) and carbohydrates (24-40%, of which 75% is a dietary fibers), and low in fat (6-12%) and < 10% minerals. Analysis of the amino acid composition reveals that the protein is of a rather similar amino acid profile to that of egg (and Protein digestibility-corrected amino acid score 0.89). Thus Mankai™ D110 appears to be a wholesome source as it provides complete protein, 'packed' into a single tiny leaf veggie with numerous vitamins (such as A, E, B6, B9 and B12), minerals (such as iron, magnesium, zinc) and dietary fibers to form a potent source for human nutrition. The low-variability between several batches under the Hinoman production methodology and the stability of Mankai™ D110 - have been provided, demonstrating that Mankai™ D110 production is stable between batches and that the ingredient is stable over a period of a full year.

Microbiological and heavy metals analyses are in conformity with the standard safety levels. Levels of oxalic acid are comparable to, or less than, those that may be ingested from common vegetables, such as spinach, Broccoli, lettuce or asparagus. Documentation on previous use of the NF source in the world has been provided, especially in Asia where the food is historically consumed. The composition of Mankai™ D110 results in a safe and stable food ingredient. The safety of Mankai™ D110 has been substantiated by in vitro genotoxicity studies and in vivo studies, in order to conclude that Mankai D110 does not present any potential hazard for human consumption. Genotoxicity (AMES, chromosome aberration in vitro) and micronucleus studies indicate lack of genotoxicity. In conclusion, MankaiTM (Wolffia globosa 'Mankai') powder characterization is compliant with all the standards of European Regulation, especially in term of contaminants, variability and stability. It is proven as safe and is already authorized and consumed outside the European Union."

In October, 2021, the EFSA NDA panel concluded, "…that an increase in manganese intake from the NF used as food ingredient or food supplements is of safety concern and the safety of the NF cannot be established"

EFSA NDA Panel (EFSA Panel on Nutrition, Novel Foods, Food Allergens), Turck D, Bohn T, Castenmiller J, De Henauw S, Hirsch-Ernst KI, Maciuk A, Mangelsdorf I, McArdle HJ, Naska A, Pelaez C, Pentieva K, Siani A, Thies F, Tsabouri S, Vinceti M, Cubadda F, Frenzel T, Heinonen M, Prieto Maradona M, Marchelli R, Neuhauser-Berthold M, Poulsen M, Schlatter JR, van Loveren H, € Kouloura E and Knutsen HK, 2021. Scientific Opinion on the safety of Wolffia globosa powder as a Novel food pursuant to

Regulation (EU) 2015/2283. EFSA Journal 2021;19(12):6938, 25 pp. https://doi.org/10.2903/j.efsa.2021.6938

4. Lemna minor and Lemna gibba whole plant material used as a vegetable by Wageningen

Application summary found at: novel-food_sum_ongoing-app_2020-1757.pdf (europa.eu)

Applicant: Wageningen Plant Research of Wageningen University & Research, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands

"This application for authorisation of a novel food in accordance with Regulation (EU) 2015/2283 concerns Lemna minor plant material. As the closely related Lemna gibba is almost similar to Lemna minor the applicant also request authorisation for Lemna gibba plant material. Lemna minor and Lemna gibba are both from the family of plants commonly named as 'duckweed'. For human food application the use of the name 'water lentils' is preferred to distinguish it from plants grown in (natural) open ponds. Both plants species will be used as either fresh vegetable, as frozen vegetable or as part of composed products like ready-to-eat dishes, smoothies or others. The plants are cultivated in closed settings like a greenhouse or indoor/vertical farming system for which cultivation, handling and processing will be performed according to HACCP principles. After harvesting, the plants are immediately processed to the water lentil (based/containing) products. The products will comply with the general food law principles, food contaminants and microbiological requirements laid in Regulation (EC) No 178/2002, Regulation (EC) No 1881/2006 and Regulation (EC) 2073/2005, respectively. Water lentils, Lemna minor and Lemna gibba, are intended as vegetable for the general population and will be sold as a sustainable, easy-to-produce new vegetable crop with the application possibilities and intake levels of any other leafy vegetable crop such as spinach, endive, lettuce or kale. The product can also easily replace other vegetables in all kind of dishes like standard 'potato-meat-vegetable' dishes, mashed potato based dishes, sauce for pasta or curries, vegetable ingredient for quiches or lasagna, soups, ready-to-eat meals, smoothies, etc but also as potential ingredient of other products like infusions, fried dishes, dairy based products like yoghurts, cheese and ice or added to meat or meat replacers similar as spinach is currently used in many of these products. Like any vegetable crop the product contains the standard macro- and micro-nutrients within the range of other vegetables. Only the protein level based in % of the total energy value is relatively high compared to other leafy vegetable crops and even compared to a product like lentils (pulse). Like most leafy vegetable crops the product contains all essential amino acids, although digestion and uptake of proteins might not be very efficient as found by a human intake study, however this was based on a large single bolus and not on portions that normally would be used for intake of vegetables. As regard to the safety of the novel food, water lentils have the capacity to accumulate some minerals and heavy metals from the cultivation solution. Therefore, when setting up a new cultivation, the water quality and added fertilisers should be balanced in such a way that harvested plants do not exceed upper limits as set for some of the nutrients and heavy metals. Analyses and scientific studies show no safety concerns for the consumption of these duckweed species as plant material. This was supported by a human

trial in which subjects who consumed 170 g Lemna minor for 11 subsequent days did not report any serious adverse effects and had no significant changes in health-related biomarkers. The microbial data of fresh harvested product exceed the limits as set in Regulation (EC) No 2073/2005. A heat treatment with either hot water, steam or microwave must be used to reduce the levels within the CFU ranges allowed for the products marketed. Products treated with hot water, steam, or any other type of sterilisation and stored as frozen product at -20°C have shown to be stable and low in microbial contaminants. Based on literature search, genomic and proteomics analysis, water lentils are not expected to have allergenic potential or a cross-reactivity with known food allergens for which food labelling is needed. This warrants no mandatory allergenicity labelling. In conclusion, Lemna minor and Lemna gibba plant material is intrinsically a safe vegetable for human consumption, but like any other vegetable crop, regular quality control for microbial and other contaminants will be required. The application has been prepared in accordance with the requirements of Commission Implementing Regulation (EU) 2017/2469 of 20 December 2017 laying down administrative and scientific requirements for applications referred to in Article 10 of Regulation (EU) 2015/2283 of the European Parliament and of the Council on novel foods, the European Food Safety Authority (EFSA) Guidance on the preparation and presentation of an application for authorisation of a novel food in the context of Regulation (EU) 2015/2283 and EFSA's Administrative guidance on the submission of applications for authorisation of a novel food pursuant to Article 10 of Regulation (EU) 2015/2283"

As of July 21, 2022 there is no record in the EFSA Journal reporting a technical decision on this application.

5. Water lentil protein concentrate from a mixture of Lemna gibba and Lemna minor by ABC Kroos BV

Application summary found at: novel-food_sum_ongoing-app_2018-0801.pdf (europa.eu)

Applicant: ABC Kroos BV, Drosteweg 6, 8101 NB Raalte, The Netherlands

"The novel food application concerns request for authorisation of a protein concentrate from a mixture of Lemna gibba and Lemna minor in accordance with Regulation (EU) No 2015/2283.

Lemna gibba and Lemna minor are more commonly known as water lentils or duckweed. The Lemna protein concentrate is a source of natural and sustainable essential nutrients, like proteins, vitamins and minerals.

The mixture of Lemna gibba and Lemna minor is cultivated in a closed environment and harvested afterwards according to the HACCP principles. After harvesting, the plants are immediately processed to the water lentil protein concentrate considered in this application. The processing is based on FSSC 22000, the general food law principles, food contaminants and microbiological requirements laid in Regulation (EC) No 178/2002,

Regulation (EC) No 1881/2006 and Regulation (EC) 2073/2005 (updated by Regulation (EC) 1441/2007), respectively.

Water lentil protein concentrate is intended for the general population excluding infants, and will be sold as a protein rich ingredient with a broad application in a variety of food categories: Hot drinks and similar (coffee, cocoa, tea and herbal infusions), Ingredients for coffee, cocoa, tea, and herbal infusions, Dishes, incl. Ready to eat meals (excluding soups and salads), Fried or extruded cereal, seed or root-based products, Soups and salads, Spoonable desserts and ice creams (generic), Extracts of plant origin, Fruit / vegetable juices and nectars, Bread and similar products, Cereal bars, Muesli and similar mixed breakfast cereals, Processed and mixed breakfast cereals, Breakfast cereals, plain, Breakfast cereals, Cereals and cereal primary derivatives, Fine bakery wares, Pasta, doughs and similar products, Food flavourings, Miscellaneous agents for food processing, Isolated proteins and other protein products, Food additives other than flavours, colours and artificial sweeteners, Food colours, Processed whole meat products, Sausages, Meat and meat products, Canned-tinned meat, Cheese, Dairy dessert and similar, Fermented milk or cream, Milk and dairy powders and concentrates, Milk, whey and cream, Phytochemicals, Vitamins, Food for particular diets, Food supplements and similar preparations, Meat imitates, Dairy imitates, Condiments (including table-top formats), Savoury extracts and sauce ingredients, Seasonings and extracts, Dessert sauces/toppings, Functional drinks, Beverages concentrates, Water and waterbased beverages. The exclusion of infants has to be labelled.

Main constituents of water lentil protein concentrate are protein, insoluble fibres, ash and lipids (from which a large part polyunsaturated fatty acids). The products are a source of vitamin H (B8) and magnesium, and are high in the vitamins B2, B6, B12, D3, E and the minerals calcium, chloride, copper, iron, manganese, phosphorus and zinc. The product contains all essential amino acids, in quantity similar or higher than the recommended levels by WHO. The protein has an overall good bioaccessibility.

Analyses and scientific studies show no safety concerns for heavy metals, mycotoxins, cyanotoxins, pesticides, and lysino-alanine. The antinutritional factors calcium oxalate (oxalic acid), polyphenols (tannins) and trypsin inhibitor are also known to be present in only relatively low concentrations. The microbial data does not exceed the limits as set in Regulation (EC) No 2073/2005. When maximum use levels are observed, no adverse nutritional effects are expected when water lentil protein concentrate are habitually used in the European dietary context.

Literature search did not report any concerns regarding the absorption, digestion, metabolism and excretion of the compounds in water lentil protein concentrate. Based on the low concentrations of undesired compounds in water lentil protein concentrate and the subchronic and acute toxicity studies of a comparable duckweed powder, no toxicological studies have been performed. Based on literature search, proteomics and protein analysis, a low or non-allergenic potential and no cross-reactivity are expected. This warrants no mandatory allergenicity labelling. We conclude that the water lentil protein concentrate is safe as a food ingredient at the proposed conditions of use and the proposed intake levels."

EFSA approved this novel food application in February 2023.

Health Canada

http://webprod.hc-sc.gc.ca/nhpid-bdipsn/ingredReq.do?id=17544

NHPID Name:
Water lentil protein concentrate

Reference:
NNHPD

Proper Name(s):
Water lentil protein concentrate

Common Name(s):
Water lentil protein concentrate

Category:
Approved Chemical Name

Schedule 1:
Extract

Sub-ingredient(s):
Fiber, Protein

Source Material:

- Lemna minor (Parts: Whole)
- Wolffia globosa (Parts: Whole)

Role: Medicinal:

Rationale:
Classified as an NHP under Schedule 1, item 2 (an extract) of the Natural Health Products Regulations.
Reference: NNHPD (http://webprod.hc-sc.gc.ca/nhpid-bdipsn/refReq.do?id=91&lang=eng)

Date Modified: 2020-06-14 07:18:27

FSANZ

The following recommendations have been made by the Advisory Committee on Novel Foods (ANCF)

Microsoft Word - Record of views updated June 2022 (foodstandards.gov.au)

Lentein (Lentein™ Complete) 2017
- Non-traditional food
- Not novel food

No safety concerns identified at intended levels of use (as an ingredient in a variety of food products at up to 24 grams per serving). This view refers to the dried and milled powder product derived from plants commonly known as duckweeds and water lentils (from the Lamnaceae family) that grow in water. Plants are grown in a controlled environment.

Wolffia australiana (whole plant)
Also known as Khai-Nam, Duckweed, Watermeal. 2020
- Non-traditional food
- Not novel food Non-traditional food in Australia and New Zealand.

No safety concerns identified. Use is similar to that of a vegetable.

Appendix 5. Selected Reviews on Rubisco

RUBISCO: Structure, Regulatory ... – Annual Reviews
https://www.annualreviews.org/doi/abs/10.1146/annurev.arplant.53.100301.135233

Ribulose-1,5-bisphosphate (RuBP) carboxylase/oxygenase (Rubisco) catalyzes the first step in net photosynthetic CO assimilation and photorespiratory carbon oxidation. The enzyme is notoriously inefficient as a catalyst for the carboxylation of RuBP and is subject to competitive inhibition by O, inactivation by loss of carbamylation, and dead-end inhibition by RuBP. These inadequacies make ...
Cited by: 990
Publish Year: 2002
Author: Robert J. Spreitzer, Michael E. Salvucci

RuBisCO – an overview | ScienceDirect Topics
https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/rubisco

RubisCO is inhibited by several hexose phosphates and by 3-phosphoglycerate, which all bind to the active site instead of RuBP. A very strong inhibitor is 2-carboxyarabinitol 1-phosphate (CA1P) (Fig. 6.8). This compound has a structure very similar to that of 2-carboxy 3-ketoarabinitol 1,5-bisphosphate (Fig. 6.5), which is an intermediate of the carboxylation reaction.

Biogenesis and Metabolic Maintenance of Rubisco
https://www.annualreviews.org/doi/full/10.1146/annurev-arplant-043015-111633

Rubisco is a remarkably inefficient enzyme, fixing only 2–10 CO 2 molecules per second. Efforts to increase crop yields by bioengineering Rubisco remain unsuccessful, owing in part to the complex cellular machinery required for Rubisco biogenesis and metabolic maintenance.
Cited by: 90
Publish Year: 2017
Author: Andreas Bracher, Spencer M. Whitney, F. Ulrich Hartl, Manajit Hayer-Hartl

A short history of RubisCO: the rise and fall (?) of Nature's predominant CO_2 fixing enzyme

https://www.sciencedirect.com/science/article/pii/S095816691730099X

Feb 01, 2018 · In this review we will bring together biochemical, structural, physiological, microbiological, as well as phylogenetic data to speculate on the evolutionary roots of the CO 2-fixation reaction of RubisCO, the emergence of RubisCO-based autotrophic CO 2-fixation in the context of the Calvin-Benson-Bassham cycle, and the further evolution of RubisCO into the 'RubisCOsome', a complex of …
Cited by: 81
Publish Year: 2018

Novel bacterial clade reveals origin of form I Rubisco
https://www.nature.com/articles/s41477-020-00762-4

Aug 31, 2020 · Rubisco sustains the biosphere through the fixation of CO2 into biomass. In plants and cyanobacteria, form I Rubisco is structurally comprised of large and small subunits, whereas all other Rubisco forms lack small subunits. The rise of the form I complex through the innovation of small subunits represents a key, yet poorly understood, transition in Rubisco's evolution. Through metagenomic analyses, we discovered a previously uncharacterized clade sister to form I Rubisco that evolved without small subunits. This clade diverged before the evolution of cyanobacteria and the origin of the small subunit; thus, it provides a unique reference point to advance our understanding of form I Rubisco evolution. Structural and kinetic data presented here reveal how a proto-form I Rubisco assembled and functioned without the structural stability imparted from small subunits. Our findings provide insight into a key evolutionary transition of the most abundant enzyme on Earth and the predominant entry point for nearly all global organic carbon.

Structure and function of Rubisco.
https://www.ncbi.nlm.nih.gov/pubmed/18294858

This review uses the information provided in these structures in a structure-based sequence alignment and discusses Rubisco function in the context of structural variations at all levels–amino acid sequence, fold, tertiary and quaternary structure–with an evolutionary perspective and an emphasis on the structural features of the enzyme that may determine its function as a carboxylase.

Rubisco regulation: a role for inhibitors | Journal of Experimental Botany
https://academic.oup.com/jxb/article/59/7/1569/646557

Introduction
Rubisco Inhibitors
Rubisco Activase
Abiotic Stress
Conclusion

The most abundant protein, Rubisco [ribulose-1,5-bisphosphate (RuBP) carboxylase/oxygenase; EC 4.1.1.39] catalyses the assimilation of CO2, by the carboxylation of ribulose-1,5-bisphosphate (RuBP) in photosynthetic carbon assimilation (Ellis, 1979). However, the catalytic limitations of Rubisco compromise the efficiency of photosynthesis (Parry et al., 2007). Compared to other enzymes of the Calvin cycle, Rubisco has a low turnover number, meaning that relatively large amounts must be present to sustain s…
See more on academic.oup.com

Function, Structure, and Evolution of the RubisCO-Like Proteins and Their RubisCO Homologs
https://mmbr.asm.org/content/71/4/576

SUMMARY About 30 years have now passed since it was discovered that microbes synthesize RubisCO molecules that differ from the typical plant paradigm. RubisCOs of forms I, II, and III catalyze CO2 fixation reactions, albeit for potentially different physiological purposes, while the RubisCO-like protein (RLP) (form IV RubisCO) has evolved, thus far at least, to catalyze reactions that are ...

The global mass and average rate of rubisco | PNAS
https://www.pnas.org/content/116/10/4738

Mar 05, 2019 · Rubisco is often claimed to be the most abundant protein on Earth, yet the quantitative evidence to support the estimate of its global mass are scarce. Here we provide a robust and detailed estimate of the global mass of Rubisco, which is an order of magnitude larger than previous estimates. We use this estimate to derive the time-average rate of terrestrial and marine Rubisco and show that ...

Plant RuBisCo: An Underutilized Protein for Food Applications
https://aocs.onlinelibrary.wiley.com/doi/abs/10.1002/aocs.12104

Aug 12, 2018 · Malnutrition is a public health concern and chronic protein malnutrition is prevalent in early childhood in many developing countries. Plant proteins are good candidates for meeting the growing protein needs. RuBisCo (ribulose-1,5-bisphosphate carboxylase/oxygenase) is a photosynthetic enzyme that exists in 4 forms (I, II, III, and IV), with form I being characteristic of higher plants. Form I RuBisCo represents 50% of leaf proteins, and is, therefore, important as a source of protein for nutrition and as a functional ingredient, although the laborious extraction process for plant proteins can limit their use in food products…

Discoveries in **Rubisco** (Ribulose 1,5-bisphosphate carboxylase/oxygenase): A historical perspective
https://www.researchgate.net/publication/6174321_Discoveries_in_Rubisco_Ribulose_15-bisphosphate_carboxylaseoxygenase_A_historical_perspective

There are two distinct forms (Forms I and II) of Rubisco
among photosynthetic Bacteria and Eucarya (Fig. 1).
There are two distinct forms (Forms I and II) of Rubisco
among photosynthetic Bacteria and Eucarya (Fig. 1).
Abstract: Historic discoveries and key observations related to Rubisco (Ribulose 1,5-bisphosphate carboxylase/oxygenase), from 1947 to 2006, are presented. Currently, around 200 papers describing Rubisco research are published each year and the literature contains more than 5000 manuscripts on the subject. While trying to ensure that all the major events over this period are recorded, this analysis will inevitably be incomplete and will reflect the areas of particular interest to the authors.
Rubisco is not really so bad – PubMed
https://pubmed.ncbi.nlm.nih.gov/29359811

In this review, we re-examine Rubisco's catalytic performance by comparison with other chemically related enzymes. We find that Rubisco is not especially slow. Furthermore, considering both the nature and the complexity of the chemical reaction, its kinetic properties are unremarkable.

From waste product to food ingredient: The extraction of abundant Plant Protein RuBisCo
Abstract Historic discoveries and key observations re-

lated to Rubisco (Ribulose 1,5-bisphosphate carboxylase/ oxygenase), from 1947 to 2006, are presented. Currently, around 200 papers describing Rubisco research are published each year and the literature contains more than 5000 manuscripts on the subject. While trying to ensure that all the major events over this period are recorded, this analysis will inevitably be incomplete and will reflect the areas of particular interest to the authors
https://www.newfoodmagazine.com/article/4461/from-waste-product-to-food-ingredient-the-extraction-of-abundant-plant-protein-rubisco/

RuBisCO, being the most abundant protein in the world, is a very good candidate for food applications. However, up to now, the greenish colour associated with RuBisCO preparations made consumer acceptance very difficult.

RuBisCO
https://www.chemeurope.com/en/encyclopedia/RuBisCO
Ribulose-1,5-bisphosphate carboxylase/oxygenase, most commonly known by the shorter name RuBisCO, is an enzyme (EC 4.1.1.39) that is used in the Calvin cycle to catalyze the first major step of carbon fixation, a process by which the atoms of atmospheric carbon dioxide are made available to organisms in the form of energy-rich molecules such as sucrose. RuBisCO catalyzes either the carboxylation or oxygenation of ribulose-1,5-bisphosphate (also known as *RuBP*) with carbon dioxide or oxygen.
RuBisCO is very important in terms of biological impact because it catalyzes the most commonly used chemical reaction by which inorganic carbon enters the biosphere. RuBisCO is apparently the most abundant protein in leaves, and it may be the most abundant protein on Earth[2]. Given its important role in the biosphere, there are currently efforts to genetically engineer crop plants so as to contain more efficient RuBisCO (see below).

Rubisco: structure, regulatory interactions, and possibilities for a better enzyme. By R. J Spreitzer and M. E. Salvucci in Annual Review of Plant Biology (2003) volume 53, page 449–75 (see: Entrez PubMed 12221984). ^ "Manipulation of Rubisco: the amount, activity, function and regulation."

Plantae | Review: Rubisco is not really so bad.
https://plantae.org/review-rubisco-is-not-really-so-bad-plant-cell-environ

Mar 30, 2018 · Review: Rubisco is not really so bad ($) (Plant Cell Environ) March 30, 2018 / in Plant Science Research Weekly / by Mary Williams. The carbon-fixing enzyme Rubisco (Ribulose-1,5-bisphosphate carboxylase/oxygenase) is much-maligned and has been described as "sluggish" and with "confused specificity".

Isolation Purification and Characterisation of Rubisco
https://www.ukessays.com/essays/biology/isolation-purification-and-characterisation-of-rubisco-from-fresh-biology-essay.php

Carbon is essential for life. Unfortunately, carbon in the earth and atmosphere is locked in highly oxidized forms, such as carbon dioxide. In order to be useful, this oxidized carbon must be "fixed" into organic forms. Plants perform this taks (sic) by 'carbon-fixation' – through photosynthesis. There is an enzyme inside plant cells, called Ribulose bisphosphate carboxylase/oxygenase (Rubisco). It takes carbon dioxide and attaches it to ribulose bisphosphate. In spite of its central role, rubisco is a very slow catalyst, when compared to other enzymes. Typical enzymes can process a thousand molecules per second, but rubisco fixes only about three carbon dioxide molecules per second. This slow rate is compensated by its increased production. Rubisco comprises of half of the protein in the chloroplasts making it the most plentiful single enzyme on the Earth.

Rubiscolytics: fate of Rubisco after its enzymatic function in a cell is terminated
https://pubmed.ncbi.nlm.nih.gov/17975207/

U Feller, I Anders, T Mae – Journal of experimental botany, 2008,59(7):1615-24

Ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco) is the predominant protein in photosynthesizing plant parts and the most abundant protein on earth. Amino acids deriving from its net degradation during senescence are transported to sinks (e.g. developing leaves, fruits). Rubisco catabolism is not controlled only by the overall sink demand. An accumulation of carbohydrates may also accelerate senescence and Rubisco degradation under certain conditions. Amino acids produced by proteolysis are rapidly redistributed in plants with proper source-sink relationships. In leaves of wheat plants with reduced sink capacity (e.g. sink removal, phloem interruption by steam girdling at the leaf base), Rubisco is degraded and free amino acids accumulate. They may be washed out in the rain during late senescence. In leaves of depodded soybeans, Rubisco is degraded and amino acids can be reutilized in these leaves for the synthesis of special vacuolar proteins in the paraveinal mesophyll (vegetative storage proteins). Nitrogen deriving from Rubisco degradation in older (senescing) leaves of annual crops is integrated to some extent again in newly synthesized Rubisco in younger leaves or photosynthesizing tissues of fruits. Finally, a high percentage of this nitrogen is accumulated in protein bodies (storage proteins). At the subcellular level, Rubisco can be degraded in intact chloroplasts. Reactive oxygen species may directly cleave the large subunit or modify it to become more susceptible to proteolysis. A metalloendopeptidase may play an important role in Rubisco degradation within intact chloroplasts. Additionally, the involvement of vacuolar endopeptidase(s) in Rubisco catabolism (at least under certain conditions) was postulated by various laboratories.

The Rubisco subunit binding protein
https://pubmed.ncbi.nlm.nih.gov/24430994/

RJ Ellis, SM Van Der Vies – Molecular Biology of Photosynthesis, 1988 – Springer
Chloroplasts contain an abundant soluble protein that binds non-covalently newly synthesized large and small subunits of the enzyme ribulose bisphosphate carboxylase-oxygenase. This binding protein has been purified from Pisum sativum and Hordeum vulgare in the form of a dodecamer consisting of equal amounts of two types of subunit. These subunits are synthesized as higher molecular mass precursors by cytoplasmic ribosomes before import into the chloroplast.

Antibodies raised against the purified binding protein from Pisum sativum detect polypeptides not only in extracts of plastids from several plant species but also in cell extracts of several bacterial species. The oligomeric binding protein dissociates reversibly into monomeric subunits in the presence of 1-5 mmol/liter MgATP. For one type of subunit the cDNA sequence has been isolated and determined and reveals homology with certain bacterial proteins. These observations are discussed in relation to the idea that the binding protein is an example of a general class of proteins termed "molecular chaperones" which are required for the correct assembly of certain oligomeric proteins such as the carboxylase from their subunits.

RUBISCO: structure and mechanism
https://www.annualreviews.org/doi/abs/10.1146/annurev.bb.21.060192.001003

G Schneider, Y Lindqvist, CI Branden- Annual review of Biophysics and Biomolecular Structure, 1992 No Abstract available
… lot of interest. Detailed kinetic studies of the catalytic reactions of Rubisco have been carried out during the past two decades and are summarized in several excellent reviews (10, 47, 48, 79, 96). This review describes recent …

Rubisco gene expression in C_4 plants
https://pubmed.ncbi.nlm.nih.gov/18325924/

M Patel, JO Berry – Journal of Experimental Botany, 2008 – academic.oup.com
In leaves of most C(4) plants, ribulose 1,5 bisphosphate carboxylase (Rubisco) accumulates only in bundle sheath (bs) cells that surround the vascular centres, and not in mesophyll (mp) cells. It has been shown previously that in the C(4) dicots amaranth and Flaveria bidentis, post-transcriptional control of mRNA translation and stability mediate the C(4) expression patterns of genes encoding the large and small Rubisco subunits (chloroplast rbcL and nuclear RbcS, respectively). Translational control appears to regulate bs cell-specific Rubisco gene expression during early dicot leaf development, while control of mRNA stability appears to mediate bs-specific accumulation of RbcS and rbcL transcripts in mature leaves. Post-transcriptional control is also involved in the regulation of Rubisco gene expression by light, and in response to photosynthetic activity. Transgenic and transient expression studies in F. bidentis provide direct evidence for post-transcriptional control of bs cell-specific RbcS expression, which is mediated by the 5' and 3' untranslated regions (UTRs) of the mRNA. Comparisons of Rubisco gene expression in these dicots and in the monocot maize indicates possible commonalities in the regulation of RbcS and rbcL genes in these divergent C(4) species. Now that the role of post-transcriptional regulation in C(4) gene expression has been established, it is likely that future studies of mRNA-protein interactions will address long-standing questions about the establishment and maintenance of cell type-specificity in these plants. Some of these regulatory mechanisms may have ancestral origins in C(3) species, through modification of pre-existing factors, or by the acquisition of novel C(4) processes.
Effects of Rubisco kinetics and Rubisco activation state on the temperature dependence of the photosynthetic rate in spinach leaves from contrasting growth …
https://pubmed.ncbi.nlm.nih.gov/16898026/

W Yamori, K Suzuki, KO Noguchi

Recently, several studies reported that the optimum temperature for the initial slope [IS(Ci)] of the light-saturated photosynthetic rate (A) versus intercellular CO2 concentration (Ci) curve changed, depending on the growth temperature. However, few studies compare IS(Ci) with ribulose 1,5-bisphosphate carboxylase/oxygenase (Rubisco) properties. Here, we assessed Rubisco activation state and in vitro Rubisco kinetics, the main determinants of IS(Ci), in spinach leaves grown at 30/25 [high temperature (HT)] and 15/10 degrees C [low temperature (LT)]. We measured Rubisco activation state and A at a CO2 concentration of 360 microL L(-1) (A360) at various temperatures. In both HT and LT leaves, the Rubisco activation state decreased with increasing temperatures above the optimum temperatures for A360, while the activation state remained high at lower temperatures. To compare Rubisco characteristics, temperature dependences of the maximum rate of ribulose 1,5-bisphosphate (RuBP) carboxylation (Vcmax), specificity factor (Sc/o) and thermal stability were examined. We also examined Vcmax, and thermal stability in the leaves that were transferred from HT to LT conditions and were subsequently kept under LT conditions for 2 weeks (HL). Rubisco purified from HT, LT and HL leaves are called HT, LT and HL Rubisco, respectively. Thermal stabilities of LT and HL Rubisco were similar and lower than that of HT Rubisco. Both Vcmax and Sc/o in LT Rubisco were higher than those of HT Rubisco at low temperatures, while these were lower at high temperatures. Vcmax in HL Rubisco were similar to those of LT Rubisco at low temperatures, and to those of HT Rubisco at high temperatures. The predicted photosynthetic rates, taking account of the Rubisco kinetics and the Rubisco activation state, agreed well with A360 In both HT and LT leaves. This study suggests that photosynthetic performance is largely determined by the Rubisco kinetics at low temperature and by Rubisco Kinetics and the Rubisco activation state at high temperature.

The structure and function of RuBisCO and their implications for systematic studies

https://pubmed.ncbi.nlm.nih.gov/21708595/

EA Kellogg, ND Juliano–- American journal of botany, 1997 As“"the most abundant protein in the world’’' ribulose-1,5-bisphosphate carboxylase (RuBisCO) attracts the attention of genetic engineers and plant phylogeneticists. The active site, which is responsible for almost all carbon fixation on earth, is in the large subunit (LSU). Over 30% of the 476 amino acids in the LSU are involved in intermolecular associations. Using available sequence data, we find that 105 (22%) of the residues are absolutely conserved across 499 seed plants, with an additional 110 demonstrating only one change. Our analyses show that conserved domains are not fully explained by current structural data. This has several implications for systematic studies. First, the number of potentially variable sites is likely to be slightly over 1000, rather than 1428. Second, rates of change can vary greatly across the molecule; functional constraints on amino acids and codon biases greatly increase the potential for homoplasy. Third, some changes are correlated, and thus might be down-weighted accordingly. Fourth, some of the variation in RuBisCO may be adaptive and present insights into the nature of evolutionary change in response to the environment.

Structure and function of Rubisco

https://www.sciencedirect.com/science/article/abs/pii/S0981942808000041

I Andersson, A Backlund–- Plant Physiology and Biochemistry, 2008–- Elsevier

… Elsevier. Plant Physiology and Biochemistry. Volume 46, Issue 3, March 2008, Pages 275-291. Plant Physiology and Biochemistry. Research article.

Ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco) is the major enzyme assimilating CO_2 into the biosphere. At the same time Rubisco is an extremely inefficient catalyst and its

carboxylase activity is compromised by an opposing oxygenase activity involving atmospheric O_2. The shortcomings of Rubisco have implications for crop yield, nitrogen and water usage, and for the global carbon cycle. Numerous high-resolution crystal structures of different forms of Rubisco are now available, including structures of mutant enzymes. This review uses the information provided in these structures in a structure-based sequence alignment and discusses Rubisco function in the context of structural variations at all levels – amino acid sequence, fold, tertiary and quaternary structure – with an evolutionary perspective and an emphasis on the structural features of the enzyme that may determine its function as a carboxylase.…

Leaf protein for food use: potential of Rubisco
https://link.springer.com/chapter/10.1007/978-1-4615-2652-0_10

Abstract. Leaf protein was discovered and characterized in 1773 by Rouelle who was demonstrator at the 'Jardin du Roi' in Paris.The historical background of these studies was reviewed by Pirie (1969). His pioneering work since World War II threw light on the fairly good nutritive value of leaf protein concentrate (LPC) which can be obtained quite easily from the leaves of a variety of plant sources. This LPC is usually obtained by heat coagulation of the whole protein in the juice produced by pressing disintegrated leaves.

Appendix 6. Allergenicity Assessment for Leaf Protein from *Lemna minor*

Allergenicity Assessment for Leaf Protein from *Lemna minor*

Summary

There is no available evidence indicating that Lemna Leaf Protein (LLP) from *Lemna minor* presents a significant food allergy risk either for currently food-allergic individuals or for the development of new food allergies.

Allergenicity Assessment

Food allergy is an IgE-mediated reaction to specific food proteins that occurs in sensitive individuals. Because there are no tests or animal models that can be used to determine whether a new food or food ingredient is a potential allergen, the assessment of potential allergenicity considers multiple factors.

Taxonomic Considerations

Lemna is a genus in the family *Lemnaceae* in the order *Arales* of monocotyledonous plants. As such, it is taxonomically unrelated to common plant-food allergens such as legumes and tree nuts. This means that it is very unlikely that there will be adventitious cross-reactivity between *Lemna* proteins and allergenic proteins in the existing food supply. As such, there is no expectation that consumers with existing food allergies will react to LLP.

Morphological Considerations

Allergenic proteins from plants predominately occur in structures such as seeds, nuts, or fruits. In contrast, *Lemna minor* reproduces primarily through vegetative budding. Therefore, it is highly unlikely that *Lemna minor* leaves (also known as fronds) will contain any proteins that are homologous with or structurally similar to known plant food allergens.

Note that *Lemna minor* plants are capable of flowering, but this is very uncommon. The taxonomic considerations described above indicate that there is no reason to expect cross-reactivity between LLP and pollen proteins from common plant species.

Proteomics

Existing guidance for assessing the potential allergenicity of new food proteins, such as those published by Codex[1] and the FDA[2], are appropriate for evaluating a single well-characterized protein. However, LLP, derived from whole leaves/fronds contains multiple proteins. Thus, tests such as digestion resistance or database searches are not useful for the allergenicity assessment of LLP (or other novel foods).

Nonetheless, four databases[3] that contain information on known allergenic proteins were examined to determine if they contained proteins from species that are related to *Lemna minor*. None were found. This is consistent with the taxonomic evaluation described above. In addition, the National Institutes of

[1] Codex Alimentarius. Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants. CXG 45-2003.
[2] FDA. Statement of Policy – Foods Derived from New Plant Varieties.
[3] Allergen Online (Univ. of Nebraska); SDAP (Univ. of Texas, Medical Branch); WHO/IUIS; COMPARE (HESI).

Health - National Center for Biotechnology Information protein sequence database was searched for entries from *Lemna minor*. A total of 514 sequence entries from this species were found, none of which were annotated as being allergens or related to allergens.

Literature Review

Three scientific and biomedical literature databases[4] were searched for publications that might discuss the potential allergenicity of *Lemna minor*. Searches used either the single search string [(lemna OR duckweed) AND (safety OR allergen)] or multiple searches without the Boolean operators. Papers published from 2018 to October 2022 were evaluated to update the information presented in GRN 742[5]. None of the searches found any relevant publications.

Previous Allergenicity Assessments

FDA GRAS Notification 742. GRN 742 concerned two versions of a protein powder product derived from a mixture of multiple species of "water lentil" including *Lemna minor*. The No Questions letter issued by the FDA in August 2018 stated that the submitter "found no evidence of allergic reactions in humans to duckweed protein." That observation remains valid.

European Food Safety Authority Opinion. An EFSA opinion published in 2021 evaluated the same substance as notified in GRN 742. That opinion did not raise any direct allergenicity issues but did note that "given the protein content of the NF[6] (35–55 g/100 g) allergic reactions to the NF are possible." There was no justification given for this concern nor is it specific to *Lemna*-derived protein products. A second opinion published in 2021 evaluated the safety (including allergenicity) of two species of *Wolffia* within the EU regulatory context for traditional foods from a third country. *Wolffia* is a very closely related sister genus to *Lemna* in the same subfamily and at least four species in this genus are part of the source material for the protein product evaluated in GRN 742. The EFSA traditional food evaluation found that "the data provided ...do not raise safety concerns." Given the close relationship between *Wolffia* and *Lemna,* there is no reason to expect that there are any allergen-related concerns for species of *Lemna*.

Consumer Exposure

Consumers in the US have been exposed to *Lemna* protein isolates for at least several years as have consumers in several other countries. For example, the protein product notified in GRN 742 can be purchased in large amounts on Amazon.com as well as at "health food" stores. Although there are no data on specific levels of exposure, these exposures have not been associated with adverse reactions reported in the biomedical literature. Further, a search of the CFSAN Adverse Event Reporting System (CAERS) data file available in October 2022 did not find any reports for products of duckweed, Lemna, or the brand name Parabel (the brand name of the substance notified in GRN 742).

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[4] PubMed, PubAg, Scopus, Google Scholar

[5] Preliminary searches confirmed that the searches were not case sensitive and that citations containing all variants of the word "allergen" could be recovered.

[6] NF – Novel Food

Conclusion

A thorough review of data from all available sources did not find any indication of known or potential allergenicity for *Lemna minor*. The strong weight of evidence shows that there is no known concern for potential food allergenicity for LLP derived from this species either as a risk for allergic consumers or for the development of new allergies.

Prepared by:

Steven M. Gendel, Ph.D.
Principal
Gendel Food Safety LLC.
November 8, 2022

Appendix 7. Expert Panel Consensus Statement Concerning the Generally Recognized as Safe (GRAS) Status of Lemna Leaf Protein (LLP) as a Food Ingredient

Expert Panel Consensus Statement Concerning the Generally Recognized as Safe (GRAS) Status of Lemna Leaf Protein (LLP) as a Food Ingredient

INTRODUCTION

Plantible Foods (hereafter referred to as "Plantible") convened a panel (the "Expert Panel") of independent scientists, qualified by their scientific training and relevant experience to evaluate the safety of food ingredients, to conduct a critical and comprehensive evaluation of the available pertinent data and information on Lemna Leaf Protein (LLP), and to determine whether LLP would be Generally Recognized as Safe (GRAS) for use as a food ingredient based on scientific procedures. The Expert Panel consisted of the below-signed qualified scientific experts: James R. Coughlin, PhD (Coughlin & Associates), Brent Flickinger, PhD (The Science Angle), and Earle Nestmann, PhD (Health Science Consultants, Inc).

The Expert Panel, independently and collectively, critically evaluated a comprehensive package of scientific information and data. This information was presented in a dossier provided by Plantible and their consultants, EAS, "EVALUATION OF THE GENERALLY RECOGNIZED AS SAFE (GRAS) STATUS OF LEMNA LEAF PROTEIN AS A FOOD INGREDIENT", which included an evaluation of all available scientific data and information, both favorable and unfavorable, relevant to the safety of LLP for use as a food ingredient in specified categories. The evaluation of LLP was largely based on its substantial equivalence to another Lemna protein product, LENTEIN™ Complete, described in GRN 742. FDA issued a "No Objections" letter to GRN 742 on August 22, 2018. Plantible prepared a body of analytical data to characterize LLP and made comparison of the composition relative to LENTEIN™ Complete. In addition, the body of data included a comprehensive search of the scientific literature (including studies published since the GRN submission date) and details of the production process of the commercial product, product specifications, supporting analytical data, intended conditions of use, and consumption estimates under the intended use, which is intended to be very similar to the comparator product on a protein adjusted basis. In addition, the Expert Panel evaluated other information deemed appropriate or necessary.

Following independent critical evaluation, the Expert Panel unanimously concluded that the intended uses described herein of LLP manufactured consistent with current Good Manufacturing Practice (cGMP) and meeting appropriate food-grade specifications, are GRAS based on scientific procedures. A summary of the basis for the Expert Panel's conclusion appears below.

SUMMARY AND BASIS FOR GRAS

Plantible intends to market LLP for use as food ingredient in the United States (US). LLP is derived from the leaf of the plant *Lemna minor*, which is also known as duckweed or water lentil. LLP is a white odorless powder containing not less than 80% protein on an 'as is' basis.

Duckweed (family Lemnaceae) is a small, free-floating aquatic plant that forms mats on or beneath the surface of water. The Lemnaceae family includes the subfamilies Wolffioideae and Lemnoideae. *Lemna minor* is a member of the Lemnoideae sub-family comprising three genera, *Lemna*, *Landoltia*, and *Spirodela* (Les et al., 2002). Lemna is one of the best known of this group and has been the subject of much research. There are at least 14 recognized species of Lemna (Les et al., 2002; Sree et al., 2016; US NPGS, 2022). The most common duckweed species include *Lemna minor, Wolffia globosa, Lemna gibba, Spirodela polyrhiza, Lemna obscura,* and *Wolffia arrhiza.*

Plantible's LLP is produced under controlled conditions in large self-contained tanks/raceway ponds in enclosed greenhouses. The ponds are filled with potable water and a stock solution of *Lemna minor* plants is added followed by addition of the appropriate nutrients necessary to obtain optimum growth. A slight circulation is maintained throughout the system to distribute the nutrients throughout. The nutrients are monitored on a regular time schedule and are replenished as necessary to maintain optimum conditions. The water supply is continually monitored for contaminating components including pathogens and heavy metals. Plants grow vegetatively in ponds and are harvested every 2 to 3 days. At time of harvest, ~40-50% of plants are harvested so that the surface of the water remains covered. On average, the plants are 10-15 days old at time of harvest.

The LLP product is described to be manufactured consistent with current Good Manufacturing Practices (cGMPs) and Risk-based Preventive Controls for Human Food. *Lemna minor* leaves are harvested, macerated to yield a green juice, followed by separation of the green fraction, followed by purification and concentration of the white fraction to yield Plantible's LLP. As part of the purification process, a covalent cation (e.g., calcium chloride) is used to coagulate the chlorophyll. Further, Plantible's extraction process incorporates both a 0.2µm microfiltration step as well as an ultrafiltration step using a 70kDa membrane to ensure that contaminants as well as heavy metals are removed from the protein composition prior to drying. All additives used in the production of LLP are determined to be food grade and safe for use in food production.

Appropriate food-grade specifications are established for LLP which include well-defined ranges for the levels of the primary compositional components: moisture, protein, ash, dietary fiber and fat. Moisture specification is not more than 10% and protein is not less than 80% on an 'as is' basis. Specifications are also set for the heavy metals Arsenic, Lead, Cadmium and Mercury, for microbial pathogens and for oxalic acid. A five-batch analysis of LLP demonstrated conformance with these specifications.

Plantible guarantees conformity of LLP to the product specifications for 28 months when stored under room temperature (20-25°C) conditions. The proposed shelf-life is supported by the results

of a stability study examining moisture content as well as visual and organoleptic properties over 7 months of storage at accelerated conditions of 42°C.

LLP is intended for use as a food ingredient and protein source at levels consistent with current Good Manufacturing Practices (cGMPs) in a variety of food categories that include beverages and beverage bases, breakfast cereals, frozen dairy desserts and mixes, grain products and pastas, milk products, plant protein products, processed fruits and fruit juices, snack foods, soft candy, soups and soup mixes, and salad dressings.

Another Lemna protein product, LENTEIN™ Complete, is described in GRN 742. FDA issued a "No Objections" letter to GRN 742 on August 22, 2018. The evaluation of LLP is largely based on its substantial equivalence to LENTEIN™ Complete. Plantible prepared a body of analytical data to characterize LLP relative to LENTEIN™ Complete, and draws upon publicly available information about the composition, nutritional value and safety of LENTEIN™ Complete and other closely related plants and protein products in the following assessment.

The food categories and inclusion levels were selected to be similar to LENTEIN™ Complete as described in GRN 742. LENTEIN™ Complete was determined to be GRAS when included in the intended foods at 1-24 g/serving. The LENTEIN™ Complete food ingredient described in GRN 742 contains up to 55% protein on a dry weight (dw) basis, which Parabel estimated was ~50% on an 'as is' basis. This is equivalent to 12 g of protein in a 24 g serving, the highest serving anticipated for LENTEIN™ Complete. LLP has a protein specification of not less than 80% protein on an 'as is basis'; therefore, the equivalent amount of protein can be delivered with 15 g of LLP/serving; maximum inclusion rates reflect this maximum target of 15 g LLP/serving. FDA considered dietary intake assessments of total protein in GRN 742 prior to issuing the "No Objections" letter.

Duckweed was first described by C. von Linne in 1753 (Sree et al., 2016). Duckweeds have been consumed as human food in several Asian countries with local names of khai nam, kai-pum, or kai nhae, and *Wolffia globosa* is sold in the vegetable markets in different regions of Thailand (Appenroth et al., 2018). The European Food Safety Authority (EFSA) recently recognized fresh plants of *Wolffia arrhiza* and *Wolffia globosa* as a "traditional food from a third country" and confirmed that cultivation under vertical farming conditions does not raise safety concerns (EFSA, 2021a). Duckweed has a long history of use as an animal feed and has more recently been investigated as a protein source for humans (Zeinstra et al., 2019). Along with its long history as a food source in Southeast Asia, water lentils (duckweed), and specifically *Lemna minor*, is captured in several plant data bases including the USDA Natural Resources Conservation Service Plants Database (USDA Plants Database), the Tropicos Database (Tropicos | Name - Lemna minor) and the US National Plant Germplasm System (Simple Query Species Data GRIN-Global (ars-grin.gov)). The latter recognizes *Lemna minor* as an edible plant for humans and animals.

There is also a large volume of published information in the popular literature related to the use of duckweed in human food including recipes and sources (Eating the Gap 2020; planetduckweed.com; rubiscofoods.com; thehealthyrd.com; see reference section for links).

Rubisco is the major protein within LLP. Rubisco is an enzyme, ribulose-1,5-bisphosphate carboxylase/oxygenase, that is present in all leafy plants and is responsible for the first step in photosynthesis, the incorporation of atmospheric CO_2 (Calvin cycle). Given its fundamental role and ubiquitous nature, Rubisco is thought to be the most abundant protein on earth (Bar-on and Milo, 2019) and it is estimated to make up 20-50% of soluble protein in leaves (Moore et al., 1995; Feller et al., 2008; Van de Velde et al., 2011). Rubisco is known to be rapidly and completely degraded at low pH in the presence of pepsin; potential allergenicity of a protein has been linked with resistance to degradation by proteases, such as pepsin (Wang et al., 2017). A literature search indicates that no adverse effects have been attributed to consumption of Rubisco.

Extracts from seven duckweed species (including *L. minor*) were tested for cytotoxic effects on the human cell lines HUVEC, K-562, and HeLa and for anti-proliferative activity on HUVEC and K-562 cell lines (Sree et al., 2019). There was no evidence that suggested that duckweeds had any detectable anti-proliferative or cytotoxic effects. The Ames assay and the *in vitro* micronucleus test were conducted with a dried powder from the related species, *Wolffia globosa* (which is also known as 'Mankai'), and demonstrated no genotoxicity potential (Kamawata et al., 2020).

There is documented consumption of duckweed by a variety of wild animals, including ducks and other waterfowl, fish, and muskrats (Hillman, 1961). In addition, a significant number of research publications focus on the use of duckweed in animal feeds including fish, chickens, pigs and cows (Mwale and Gwaze, 2013; Rojas et al., 2014; Rusoff et al., 1980; Huque et al., 1996; Hasan and Chakrabarty, 2009). While these reports dwelt primarily on the efficacy of the use of duckweed in these applications, the peripheral safety data can be used to infer safety in humans.

Parabel conducted an acute oral toxicity study of LENTEIN™ Complete in rats in accordance with OECD 420. No mortality or signs of toxicity were observed at 2,000 mg/kg bw, the highest dose tested (GRN 742). In addition, the repeated oral administration of Parabel's LENTEIN™ Complete in rats at 1000 mg/kg bw daily for 90-days showed no observable toxic effects when compared to its corresponding control group of animals. The NOAEL was determined to be 1000 mg/kg bw, the highest dosage tested (GRN 742).

A 90-day rat study designed according to OECD 408 was also conducted with dried Mankai powder from *Wolffia globosa* (Kawamata et al., 2020). Six-week-old SD rats [Crl:CD(SD)] rats were distributed randomly to four groups of 10 male and 10 female rats per group according to body weight. Mankai was provided in the diet at 0 %, 5 %, 10 %, or 20 % (w/ w) levels for 91 days. Overall, the mean test article intake throughout the administration period was 3.18, 6.49, and 13.16 g/kg/day for males and 3.58, 7.42, and 15.03 g/kg/day for females at 5%, 10 %, and 20 % (w/w), respectively. There were no mortalities during the administration period and no test article-related changes in clinical observations, detailed clinical observations, manipulative tests, measurement of grip strength and motor activity, body weight, food consumption, ophthalmology, plasma hormone levels, organ weight, necropsy, and histopathology. There were a few differences noted in urinalysis and hematological parameters that were not deemed to be of toxicological significance. For example, decreases in total cholesterol, phospholipid, calcium, and inorganic phosphorus in males at 20 % (w/w) Mankai in the diet and increases in glucose and blood urea nitrogen in females at 20 % (w/w) Mankai in the diet were small changes and individual values were generally within the historical control data in the test facility. The no observed adverse effect

level (NOAEL) of Mankai under these study conditions was judged to be 20 % (w/w) for both males and females, i.e., 13.16 and 15.03 g/kg/day for males and females, respectively. As no abnormalities were detected up to a very high dose level, i.e., 20 % (w/w), Mankai was considered to be a food with no toxicity concerns and an excellent nutritional balance. EFSA (2021b) reviewed this study as part of a novel food (NF) application. In their analysis EFSA said, "A number of significant findings were seen in the urinalysis, haematology, blood chemistry and organ weights, in the animals fed with the NF. Most of these findings were considered as treatment-related, but the mode of action cannot be explained. Considered on their own, many of them will not be considered as adverse. However, taking together statistically significant outcomes especially for the high dose groups and the lack of a plausible explanation, the Panel considers the middle dose tested for males (i.e., 6.5 g/kg bw per day) as the overall no observed adverse effect level (NOAEL) of this study". Regardless, this NOAEL is 8-16 times higher than the estimated dietary exposure to LENTEIN™ Complete of 0.39-0.79 g/kg bw/day (27.8-55.6 g/person/day as reported in FDA's "No Objections" Letter to GRN 742, and assuming 70 kg bw).

GRN 742 also reported no adverse effects observed in feeding studies in a variety of livestock, poultry, fish and shrimp species.

A body of clinical studies shows consumption up 170 g of fresh duckweed leaf per day on a short-term basis and up to 100 g of duckweed plant per day on a long-term (18-month) basis with no adverse effects and potential health benefits (Zeinstra et al., 2019; Mes et al., 2022a; Mes et al. 2022b; Yaskolla Meir et al., 2021).

GRN 742 included an extensive global literature search on the safety of water lentils and water lentil proteins, and no publications were found that indicated allergic potential. Also included in GRN 742, GRAS Associates LLC consulted allergen expert Dr. Steven Taylor of the Food Allergy Research and Resource Program of the University of Nebraska. Dr. Taylor advised that the available testing techniques are not suited for evaluating the allergenic potential of the mixture of proteins found in water lentils. The authors of GRN 472 reiterated the history of safe consumption without reports of allergic reaction and the role of labeling in informing consumers who wish to avoid certain ingredients. Plantible also sought the opinion of an allergy expert, Dr. Steve Gendel. Dr. Gendel reviewed previous regulatory conclusions and the published literature since that time and found no new relevant publications that would alter those conclusions. Consideration was given to the taxonomic and morphological characteristics of *L. minor*, which would not suggest similarity to known food allergens. No proteins from species that are related to *L. minor* were reportedly identified in suitable databases that contain information on known allergenic proteins. Finally, Lemna protein isolates are available to consumers in the U.S. and other countries, with no reports of adverse effects in the biomedical literature or in the CFSAN Adverse Event Reporting System. In conclusion, no available evidence currently exists indicating that Lemna Leaf Protein (LLP) from *Lemna minor* presents a significant food allergy risk either for currently food-allergic individuals or for the development of new food allergies according to Dr. Gendel's expert opinion.

CONCLUSIONS

Based on a critical evaluation of the publicly available data, summarized herein, the Expert Panel members whose signatures appear below, have individually and collectively concluded that Lemna

Leaf Protein, meeting the specifications cited herein, and when used as a food ingredient in a variety of food products (that include beverages and beverage bases, breakfast cereals, frozen dairy desserts and mixes, grain products and pastas, milk products, plant protein products, processed fruits and fruit juices, snack foods, soft candy, soups and soup mixes, and salad dressing), at use levels consistent with current Good Manufacturing Practices as described in this monograph is safe.

It is also our opinion that other qualified and competent scientists reviewing the same publicly available toxicological and safety information would reach the same conclusion. Therefore, we have also concluded that Lemna Leaf Protein, when used as described, is Generally Recognized As Safe (GRAS) based on scientific procedures.

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