SAFETY EVALUATION DOSSIER SUPPORTING A GENERALLY RECOGNIZED AS SAFE (GRAS) CONCLUSION FOR THE USE OF CORN BRAN ARABINOXYLAN IN CONVENTIONAL FOODS

SUBMITTED TO:

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

SUBMITTED BY:

AgriFiber Solutions, LLC
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Mundelein, IL 60060

CONTACT FOR TECHNICAL OR OTHER INFORMATION:

Toxicology Regulatory Services, Inc.
SafeBridge Regulatory and Life Sciences Group,
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154 Hansen Road, Suite 201
Charlottesville, VA 22911

March 10, 2021

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1. SIGNED STATEMENTS AND CERTIFICATION

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

March 10, 2021

G. Craig Llewellyn, Ph.D. Date
Principal and Scientific Director
Toxicology Regulatory Services (TRS), Inc.
SafeBridge Regulatory and Life Sciences Group,
A Trinity Consultants Inc. Company
Agent for AgriFiber Solutions, LLC

A. Name and Address of Notifier

AgriFiber Solutions, LLC
1011 Campus Drive
Mundelein, IL 60060

B. Name of GRAS Substance

The subject of this GRAS conclusion is corn bran arabinoxylan (herein also referred to as "BFG").

C. Intended Use and Consumer Exposure

Corn bran arabinoxylan (BFG) is proposed for use as a formulation aid (binder/gelling agent/texturizer/stabilizer/thickener/emulsifier) at a maximum use level of 3% and a good source of fiber at a maximum use level of 3.8 g/serving in a variety of food categories. BFG is also proposed for use as an excellent source of dietary fiber at a maximum level use level 7.6 g/serving in yogurt, smoothies and grain drinks, and powdered nutritional supplements. BFG is not intended for use in meat and poultry products, which are under the jurisdiction of the United States Department of Agriculture (USDA), or in infant formula. Average and high-end

consumer intake of BFG from AgriFiber's proposed uses is estimated to range from 5 to 27 g/day (providing a dietary fiber intake of up to 24.3 g/day based on a maximum dietary fiber content of 90%), for the total U.S. population.

D. Basis for GRAS Conclusion

Regulatory Framework

The regulatory framework for determining whether a substance can be considered generally recognized as safe (GRAS) in accordance with section 201(s) (21 U.S.C. § 321(s)) of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. § 301 et. Seq.) (the "Act"), is set forth at 21 CFR §170.30, which states:

> "General recognition of safety may be based only on the view of experts qualified by scientific training and experience to evaluate the safety of substances directly or indirectly added to food. The basis of such views may be either (1) scientific procedures or (2) in the case of a substance used in food prior to January 1, 1958, through experience based on common use in food. General recognition of safety requires common knowledge about the substance throughout the scientific community knowledgeable about the safety of substances directly or indirectly added to food.
>
> General recognition of safety based upon scientific procedures shall require the same quantity and quality of scientific evidence as is required to obtain approval of a food additive regulation for the ingredient. General recognition of safety through scientific procedures shall ordinarily be based upon published studies which may be corroborated by unpublished studies and other data and information."

GRAS Conclusion

The basis for the GRAS conclusion for corn bran arabinoxylan (BFG) is through scientific procedures in accordance with 21 CFR §170.30 (a) and (b).

The criteria stated above are applied herein to determine whether the use of BFG is GRAS for the following intended conditions of use: as a source of dietary fiber, as a formulation aid (e.g., binder and gelling agent), as a texturizer, and as a stabilizer and thickener (e.g., emulsifier) within select foods and beverages.

The entire body of available information relevant to the safety of BFG, including identity, specifications, manufacturing process, probable consumer exposure, toxicology and safety profile, and human clinical study provides a basis upon which to conclude that there is a reasonable certainty that BFG is safe under its intended conditions of use. In addition, because the information supporting safety is widely known and accepted by qualified experts (refer to Exhibit II, GRAS Panel Report), it is concluded that BFG is generally recognized as safe (GRAS) for the intended condition of use described herein.

Based upon our findings and knowledge of the information compiled in this dossier, we conclude that BFG is GRAS for the intended conditions of use described herein. To the best of our knowledge, the current GRAS conclusion is a complete, representative, and balanced assessment that includes unfavorable information, as well as favorable information, known to us and pertinent to the evaluation of the safety and GRAS status of the use of BFG.

E. Availability of Information

Questions or requests for additional information may be directed to: Toxicology Regulatory Services Inc, SafeBridge Regulatory and Life Sciences Group, A Trinity Consultants Inc. Company, 154 Hansen Road, Suite 201, Charlottesville, VA 22911 [contact: G. Craig Llewellyn, Ph.D. (Agent for AgriFiber Solutions, LLC), telephone (434) 977-5957; email: CLlewellyn@ToxRegServ.com].

2. IDENTITY, METHOD OF MANUFACTURE, SPECIFICATIONS, AND PHYSICAL OR TECHNICAL EFFECT

This section of the GRAS conclusion fulfills the requirements of 21 CFR §170.230 by providing information related to the GRAS material identity, method of manufacture, specifications, and physical or technical effect including product characteristics and analytical data.

A. Trade or Common Name

The subject of this GRAS conclusion is corn bran arabinoxylan (also herein referred to as "BFG").

B. Chemical Name

Not applicable

C. Synonyms

AgriFiber BFG; BFG; corn bran arabinoxylan; corn bran AX; corn bran fiber; corn bran extract; soluble corn bran fiber; soluble corn fiber; vegetable fiber (corn); corn fiber; soluble grain fiber (corn); grain fiber (corn).

D. CAS Registry Number

Not applicable

E. Product Characteristics

Corn bran arabinoxylan (BFG) is a slightly sweet tasting, odorless, tan powder. BFG has a bulk density between 15-42 lb/cubic foot (depending on the method of drying), a granulation size that passes through U.S. standard 20 mesh, and a viscosity around 500-600 cps (Brookfield HA Viscometer: #5 spindle, 12 rpm, 25°C, 10.00% solids). Specifications for BFG are presented below in Table 1 and included as Exhibit 1-A. Batch analysis results from three non-consecutive batches of BFG demonstrating conformance to product specifications, as well as microbial and heavy metals analytical results are provided in Exhibit I-B and summarized in Table 2.

AgriFiber maintains raw material specifications that ensure that every lot of raw agricultural material used to produce BFG (i.e., corn bran) is analyzed for microbial contaminants and heavy metals (lead, arsenic [total], cadmium, and mercury), as summarized in Table 3. In addition, the raw materials are routinely analyzed for aflatoxins, vomitoxin, and pesticides. For robust verification, a composite sample of three lots of BFG was also analyzed for the presence of a

large swath of pesticide parameters; the results of which confirmed that BFG is not contaminated with pesticides (Exhibit 1-B).

BFG is expected to be stable and without degradation for at least two years when kept in a sealed container under cool, dry storage conditions.

Table 1. Specifications for Corn Bran Arabinoxylan (BFG)

Analytical Parameter	**Units**	**Acceptable Target/Range**	**Method of Analysis**
Appearance	N/A	Tan powder	Organoleptic
Taste	N/A	Slightly sweet	Organoleptic
Moisture	%	< 9	Ohaus MB 45, 1 min
Ash	%	< 6	Mod 923.03/942.05, Dried Basis
Total dietary fiber (arabinoxylan)	%	74-90	AOAC 2009.01 AOAC 2011.25
Aerobic Plate Count	CFU/g	< 6,000	FDA BAM
Yeast	CFU/g	< 10	FDA BAM
Mold	CFU/g	< 10	FDA BAM
Escherichia coli	CFU/g	< 10	FDA BAM
Coliform	CFU/g	< 10	AOAC 991.14
Salmonella	/25 g	Negative	FDA BAM

Association of Official Agricultural Chemists (AOAC); Colony-forming unit (CFU); Food and Drug Administration Bacteriological Analytical Method (FDA BAM); gram (g); not applicable (N/A)

Table 2. Analytical Results on Three Nonconsecutive Lots of Corn Bran Arabinoxylan (BFG)

Parameter	Units	Specification / Acceptable Target*	BFG948879-01	BFG948179-01	BFG948779-01	Method
Appearance[1]	N/A	Tan – brown powder	Light brown	Light brown	Light brown	Organoleptic
Taste[1]	N/A	Slightly sweet	Slightly sweet	Slightly sweet	Slightly sweet	Organoleptic
Moisture[1]	%	< 9	8.60	4.41	4.81	Ohaus MB 45, 1 min
Ash[2]	%	< 6	4.71	5.29	4.58	Mod 923.03/942.05, Dried Basis
Total dietary fiber (arabinoxylan)[2]	%	74-90	79.56	78.53	81.61	AOAC 2009.01 AOAC 2011.25
Aerobic Plate Count[1]	CFU/g	< 6,000	5100	4800	1200	FDA BAM
Yeast[1]	CFU/g	< 10	< 10	< 10	< 10	FDA BAM
Mold[1]	CFU/g	< 10	< 10	< 10	< 10	FDA BAM
Escherichia coli[1]	CFU/g	< 10	< 10	< 10	< 10	FDA BAM
Coliform[1]	CFU/g	< 10	< 10	< 10	< 10	AOAC 991.14
Salmonella[1]	/25 g	Negative	Negative	Negative	Negative	FDA BAM
Clostridium perfringens[3]	CFU/g	< 10*	< 10	< 10	< 10	FDA BAM 8th Edition Chap 16
Aflatoxin ELISA[3]	ppb	< 5.0*	< 5.0	< 5.0	< 5.0	AOAC RI-05091
Lead[3]	ppm	< 0.10*	< 0.10	< 0.10	< 0.10	AOAC 985.01 Modified (ICP-MS)
Arsenic (Total)[3]	ppm	< 0.10*	< 0.10	< 0.10	< 0.10	AOAC 985.01 Modified (ICP-MS)
Cadmium[3]	ppm	< 0.10*	< 0.10	< 0.10	< 0.10	AOAC 985.01 Modified (ICP-MS)
Mercury[3]	ppm	< 0.10*	< 0.10	< 0.10	< 0.10	AOAC 985.01 Modified (ICP-MS)

[1] Results from AgriFiber's certificates of analysis (COAs) dated June 25, 2020.
[2] Results from Eurofins' COAs dated November 09, 2020.
[3] Results from Deibel Laboratories COAs dated June 25, 2020.
* Acceptable Target for parameters not in BFG Specifications but monitored periodically and/or monitored in the raw material

Table 3. BFG Raw Material (Corn Bran) Specifications

Analytical Parameter	Units	Acceptable Target/Range	Method of Analysis
Aerobic Plate Count	CFU/g	< 25,000	FDA BAM
Yeast	CFU/g	< 1,000	FDA BAM
Mold	CFU/g	< 1,000	FDA BAM
Escherichia coli	CFU/g	< 10	FDA BAM
Coliform	CFU/g	< 100	AOAC 991.14
Salmonella	/25 g	Negative	FDA BAM
Deoxynivalenol (DON; Vomitoxin)	ppm	< 10	Lateral flow test (LFT) (EnviroLogix)
Aflatoxin	ppb	< 20	Lateral flow test (LFT) (EnviroLogix)
Fumonisin	ppm	< 4	Lateral flow test (LFT) (EnviroLogix)
Lead	ppm	< 0.10	AOAC 985.01 Modified (ICP-MS)
Arsenic (Total)	ppm	< 0.10	AOAC 985.01 Modified (ICP-MS)
Cadmium	ppm	< 0.10	AOAC 985.01 Modified (ICP-MS)
Mercury	ppm	< 0.10	AOAC 985.01 Modified (ICP-MS)

F. Product Composition

Corn bran arabinoxylan (BFG) is a hemicellulose primarily comprised of water soluble arabinoxylan. BFG is prepared by an alkali-hydrothermal process that fractionates corn bran lignocellulosic material, followed by enzymatic (endo-β-1,4-xylanase) hydrolysis that produces lower molecular weight fragments of arabinoxylan. As a non-starch polysaccharide, arabinoxylans are naturally occurring dietary fibers that are abundant in the cell wall of monocotyledonous plants in the family *Poaceae* (formally known as *Gramineae*) (Kale *et al*., 2018; Izydorczyk and Biliaderis, 2007). They are a major component of fibers within cereal grains, such as corn, wheat, rye, rice, sorghum, and millet, as well as other grasses, such as psyllium, flax, and bamboos, and; therefore, arabinoxylans constitute an important portion of the dietary fiber consumed by humans (Izydorczyk and Biliaderis, 2007). The structural commonality among arabinoxylans is the linear β-(1,4) linked D-xylopyranose backbone with α-L-arabinofuranose residues as side chains. The additional presence of ferulic acid and sugars, such as galactose and glucuronic acid, in the side chains also imparts a large degree of structural heterogeneity (Serra *et al*., 2020; Kale *et al*., 2018).

BFG is a corn bran arabinoxylan that contains a minimum 74% dietary fiber, with a neutral monosaccharide composition comprised of around 49% xylose, 43% arabinose, and 8% galactose (total weight of neutral monosaccharides) (Table 4). While xylose provides the

backbone of corn bran arabinoxylan, arabinose forms the branching points and galactose is present in the side chains. The molecular structure of corn bran arabinoxylan (BFG) is shown in Figure 1. The product exhibits an arabinose-to-xylose ratio around 0.84 to 0.88 (Table 4) with sections of the arabinoxylan chain further substituted with ferulic acid and glucuronic acid, which is indicative of a heavily branched structure with complex side chains (Izydorczyk and Biliaderis, 2007; Nguyen *et al*., 2020; Rose, *et al.*, 2010; Saulnier *et al.*, 1995a). The ratio of arabinose to xylose is noted to vary (e.g. typically from 0.3 to 1.1) among arabinoxylans derived from different grain species (Izydorczyk and Biliaderis, 2007; Rose et al., 2010) (discussed further below in Section 6). As shown in Table 4, uronic acids comprise approximately 17% of the BFG ingredient, which is in the range of uronic acid residues found in other dietary fiber sources (e.g. 4.4% in wheat bran, 6.5% in apple, 11.1% in carrot, 22.4% in potato fiber (Theander et al., 1995)). The total amount of free and bound ferulic acid in BFG as determined from analysis of representative samples was ≤ 1.2% (AgriFiber 2021; *unpublished data on file*) (see safety discussion in Section 6).

G. Molecular and Structural Formula

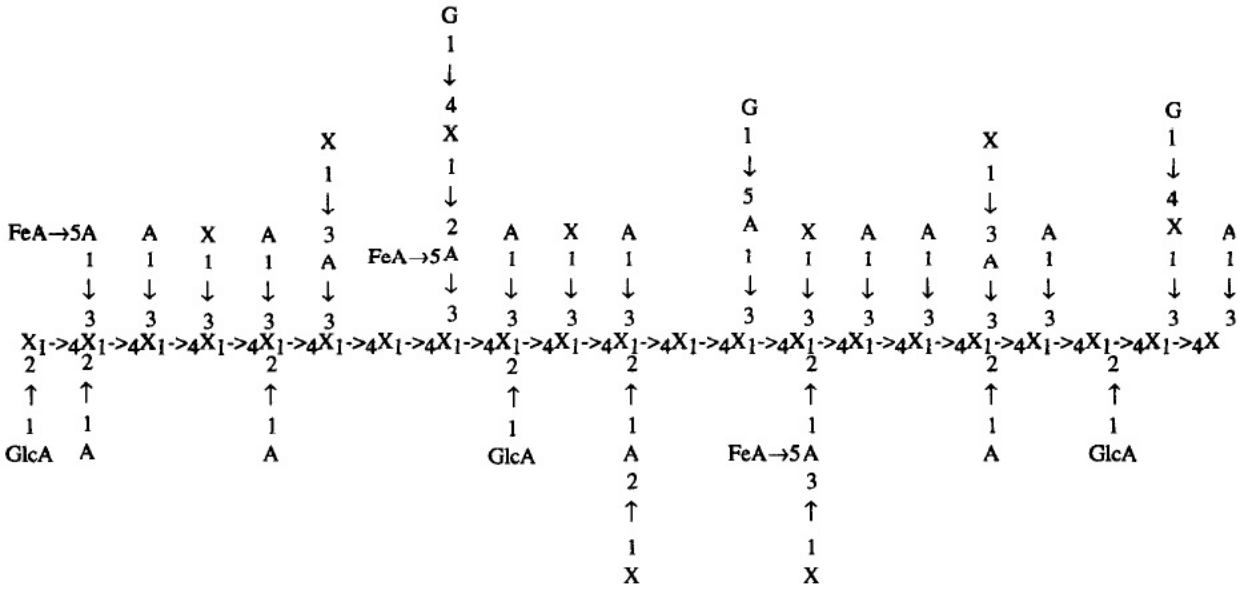

Figure 1. Molecular Structure of Corn Bran Arabinoxylan (BFG). A, L-arabinose; **X**, D-xylose; **G**, galactose; **GlcA**, glucuronic acid; **FeA**, ferulic acid. Figure adapted from Saulnier *et al*., 1995c.

Table 4. BFG Monosaccharide Composition and Nutritional Analysis

	BFG Sample ID[1]			Analysis Method
	948179	948779	948879	
Composition of carbohydrates[2]				
Monosaccharide Composition				
Xylose (%)	20.5 ± 2.5	20.8 ± 1.8	21.8 ± 3.0	AACC 32-25 (alditol acetate method)
Arabinose (%)	18.1 ± 2.4	18.4 ± 1.3	18.4 ± 3.3	
Galactose (%)	3.3 ± 0.5	3.5 ± 0.5	3.4 ± 1.6	
Glucose (%)	< 1	< 1	< 1	
Uronic Acids (%)	17.5 ± 1.5	16.6 ± 0.9	17.6 ± 0.1	
Lignin (%)	< 1	< 1	< 1	
Relative Percentages of Neutral Monosaccharide[3]				
Xylose (relative %)	48.9	48.7	50.0	AACC 32-25 (alditol acetate method)
Arabinose (relative %)	43.2	43.1	42.2	
Galactose (relative %)	7.9	8.2	7.8	
Arabinose to xylose ratio	0.88	0.88	0.84	
Galactose to xylose ratio	0.16	0.17	0.16	
Degree of polymerization	24	20	17	Anion-exchange chromatography
Nutritional analysis[4]				
Estimated KCAL per 100g	201	207	206	Atwater calculation
Total triglycerides (%)	1.16	1.22	0.98	AOAC 996.06
Saturated fat (%)	0.52	0.53	0.48	
Monounsaturated fat (%)	0.38	0.42	0.33	
Polyunsaturated fat (%)	0.17	0.19	0.09	
Protein (%)	5.75	5.56	5.19	AOAC 990.03 and 992.15
Nitrogen (%)	0.92	0.89	0.83	
Carbohydrates (%)	81.96	84.97	84.28	CFR 21 calculation
Total sugars (%)	<0.35	<0.35	<0.35	AOAC 982.14
Total dietary fiber (%)	78.53	81.61	79.56	AOAC 2009.01 and 2011.25
Soluble dietary fiber (%)	76.88	80.27	78.86	

Insoluble dietary fiber (%)	1.65	1.34	0.70	
Moisture (%)	5.84	3.67	4.84	AOCS Ca 2e-84
Ash (g/100g)	5.29	4.58	4.71	AOAC 942.05
Calcium (g/100g)	0.19	0.21	0.21	
Iron (g/100g)	0.02	0.002	0.003	AOAC 984.27, 927.02, 985.01, and 965.17
Potassium (g/100g)	0.06	0.06	0.05	
Sodium (g/100g)	1.98	1.63	1.68	

AACC: American Association of Cereal Chemists; AOAC: Association of Official Analytical Collaboration; AOCS: American Oil Chemists' Society

[1] Samples 948179, 948779, and 948879 were from non-consecutive lots isolated from the same raw corn bran material.

[2] Samples were analyzed by The Whistler Center for Carbohydrate Research (*unpublished report maintained on file with AgriFiber*). Method of analysis are described in Deehan *et al*., 2021 [*unpublished report; Appendix Table 2*]).

[3] Relative percent refers to percent of total neutral monosaccharides (i.e. xylose, arabinaose, and galactose).

[4] Samples were analyzed by Eurofins Scientific (COAs dated November 09, 2020).

H. Production Process

Corn bran arabinoxylan (BFG) is produced in accordance with current Good Manufacturing Practice.

The initial manufacturing process is the same as described in GRAS Notice (GRN) 427 (FDA, 2012) for corn hull fiber, in which the starting material, corn bran, is subjected to an alkali-hydrothermal process to disintegrate the cellular structures of the dietary fiber substances. The corn bran is first hydrated using hot water to form a slurry and then the pH is adjusted as necessary to reach a pH between 5 and 7.5. Once food grade α-amylase is added for destarching and sodium hydroxide is added, the reaction proceeds until a designated viscosity is reached. Whereas the insoluble corn hull fiber is obtained from the dried and milled suspension, the supernatant and wash water solids are further processed into the soluble corn bran arabinoxylan (BFG).

All raw materials and processing aids used to manufacture BFG are food-grade ingredients in compliance with U.S. regulations, and/or have previously been determined to be GRAS for their respective uses.

Manufacturing flow diagrams of the process for BFG are provided in Figure 2. In the first step of the process, as shown in Figure 2A, all the supernatants from the production of corn hull fiber, as in from Wash No. 1 and Wash No. 2, are combined together in a collection tank, and then the following additions are made to perform an enzyme treatment:

- Hydrochloric acid addition for pH adjustment to approximately neutral,
- Enzyme addition (endo-β-1,4-xylanase) to achieve target hydrolysis, and
- Water addition to achieve the target solids.

As shown is Figure 2B, the supernatant is then filtered through a food grade ultrafiltration membrane, which concentrates the solution into a process tank while the permeate from the process is discarded. The physicochemical properties of the ultrafiltrated and concentrated sample (e.g., viscosity and pH) are then evaluated before additional purification processes using diafiltration. The concentrate is then subjected to food grade diafiltration to further purify the concentrate. The permeate from this process is also discarded.

From the process tank, the material is pumped into the dryer feed tank, as shown in Figure 2C. For select functional applications, a food grade acid (e.g., citric acid) may also be added to the tank in order to adjust the pH of the final material prior to drying. Once all the material is transferred to the tank, the drying process is initiated by using either a double drum dryer or a

spray dryer. From the drum dryer, the dried material is further milled and sieved, prior to being packaged and demagnetized.

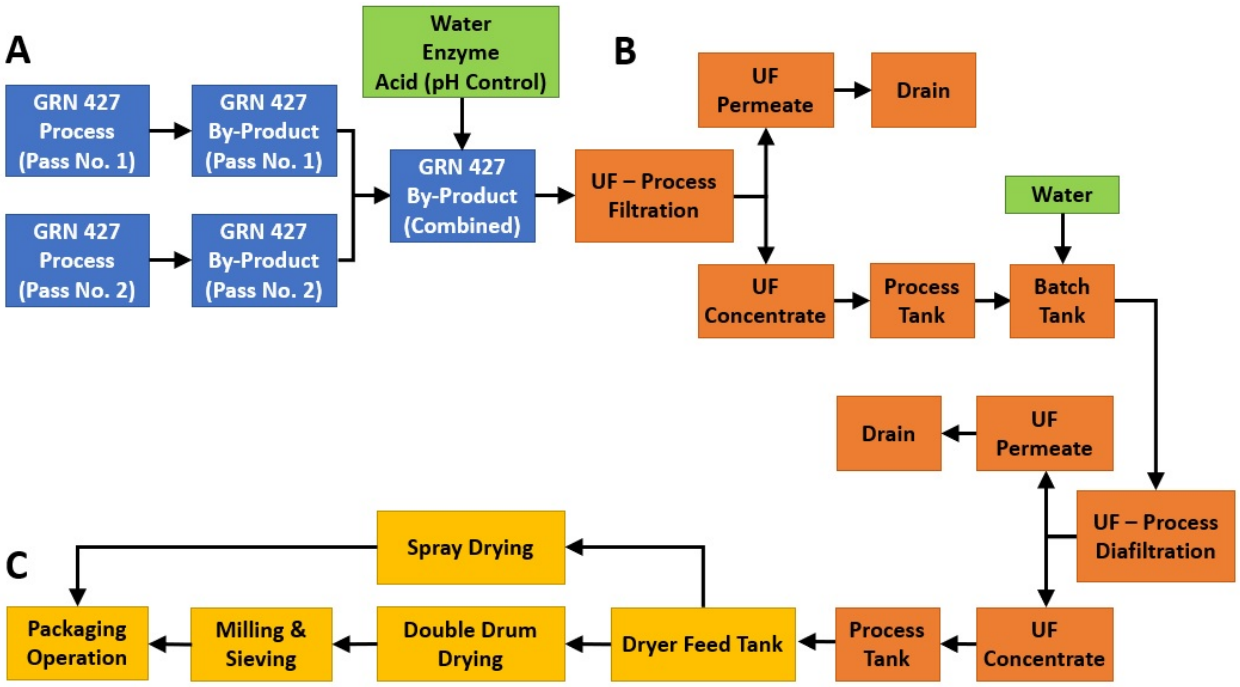

Figure 2. Manufacturing Process for Corn Bran Arabinoxylan (BFG). A) Initial manufacturing process that has been described in GRAS Notice (GRN) 427 for corn hull fiber (FDA, 2012). **B)** Ultrafiltration (UF) and diafiltration processing of the supernatants obtained from GRN 427. **C)** Drying, milling, and packaging of the concentrated material.

I. Physical or Technical Effect

Corn bran arabinoxylan (BFG) is intended for addition to conventional foods for which no standard of identity exists, or for which the standard of identity would allow for such addition of BFG, as a source of dietary fiber, as a formulation aid (e.g., binder or gelling agent) (21 CFR §170.3(o)(14)), as a texturizer (21 CFR §170.3(o)(32)), and as a stabilizer and thickener (e.g., emulsifier) (21 CFR §170.3(o)(28)).

3. DIETARY EXPOSURE

This section of the GRAS conclusion fulfills requirements of 21 CFR § 170.235 in regard to the dietary exposure of corn bran arabinoxylan (BFG) as a result of its intended uses and use levels in a variety of foods.

A. Intended Uses and Use Levels

Corn bran arabinoxylan (BFG) is proposed for use as formulation aid (texturizer/binder/gelling agent/stabilizer/thickener/emulsifier) and/or a source of dietary fiber in a variety of food and beverage categories as listed in Table 5 below. BFG is not intended for use in infant formula or in specific products for which U.S. Standards of Identity do not permit such use. A broad listing of proposed categories is included herein for completeness and to allow flexibility in future ingredient applications; however, BFG is expected to be used in a more limited number of categories in the short-term. As a formulation aid, BFG is proposed for use at levels up to 3.0%, though typical use levels will vary between 0.5-1.5%. As a fiber source BFG is proposed for use at up to 3.8 g BFG/serving in order to deliver 2.8 g fiber/serving (i.e., 10% of the daily recommended value (DRV) of 28 g for dietary fiber (FDA, 2020)), except in yogurt and smoothies and grain drinks in which BFG is proposed for use at up to 7.6 g BFG/serving in order to deliver 5.6 g fiber/serving (i.e., 20% of the DRV for dietary fiber). Therefore, foods containing 3.8 g BFG/serving would meet the FDA criteria for being a "good source" of dietary fiber per 21 CFR 101.54(c) and yogurt or smoothies and grain drinks containing 7.6 g BFG/serving would meet FDA criteria for being an "excellent source" of dietary fiber per 21 CFR 101.54(b). Additionally, BFG is proposed for use in powdered nutritional supplements at up to 7.6 g BFG/serving. The use of BFG in powered nutritional supplements is considered substitutional for the intended food uses captured in Table 5.

These proposed uses for BFG are comparable to uses of similar materials previously concluded to be GRAS with associated Letters of No Questions issued by US FDA (e.g. GRN 427 [FDA, 2012]; GRN 343 [FDA, 2010], GRN 458 [FDA, 2013], GRN 816 [FDA, 2019], as indicated in Table 5 below. For example, corn hull fiber (**GRN 427**) was concluded to be GRAS for use as a formulation aid and/or source of fiber at levels ranging from **0.25 to 3.0%** in baked goods and cereal products, coatings and breadings, dairy products, egg products, dressings and dips, sauces, soups, and gravies, snacks, and fillings, toppings, and icings. Wheat bran extract composed primarily of xylo-oligosaccharides (XOS) and arabinoxylo-oligosaccharides (AXOS) (**GRN 343**) was concluded to be GRAS as an ingredient in baked goods and baking mixes, beverages and beverage bases, breakfast cereals, frozen dairy desserts, gelatin and puddings, grain products and pastas, jams and jellies, milk products, processed fruits and fruit juices, processed vegetables and vegetable juices, and snack foods at concentrations ranging from **2.4 to 3.2 g/serving** [FDA, 2010], with the lowest concentration identified in the exposure assessment for a specific food category (Table 5) equal to 1.08 g/serving. XOS from powdered corncobs (**GRN 458**) was concluded to be GRAS as an ingredient in breakfast bars, cereal bars, cheese, chewing gums, custards, flavored and soy milk, gelatin desserts and salads, medical foods, milk and milk products, isotonic beverages, milk desserts, ready-to-drink milk-based meal replacements, power bars, puddings, protein bars, processed fruits, juice drinks and punch,

ready-to-eat cereals, sports drinks, and yogurt at levels ranging from **0.2 to 2.4 g/serving**. Xylooligosaccharides from sugarcane (**GRN 816**) was concluded to be GRAS as an ingredient in bars, crackers and salty snacks, chewing gums, breads, grains and pastas, coconut beverages, juices and nectars, bottled and canned coffees and prepared teas, fruit drinks and non-fruit beverages, beverage concentrates, nutrition drinks, nutrition powders, energy and sports drinks (fluid replacements) and other functional beverages, cookies, gelatin desserts or salads, cereal grains (not cooked), pancakes and waffles, cooked cereals, ready-to-eat cereals, cheese and imitation cheese, imitation milk (fluid), yogurt, flavored milk and milk drinks (fluid), mild, dry, and powdered mixes with dry milk (not reconstituted), cream substitutes, frozen milk desserts, puddings, custards, and other milk desserts, cheese soups, and nut butters at levels ranging from **0.10 to 43.33**, and as a sugar substitute as use levels ranging from **50 to 100 g/100 g** food.

Only a few proposed BFG food categories are not included in one or more of these previous GRNs, such as plant-based dairy alternatives, plant-based meat substitutes, and chocolate and non-chocolate candies and confections. These categories are not expected to substantially increase consumer intake of BFG beyond the estimates derived in previous GRNs (see discussion below).

Table 5. List of Food and Beverage Categories Proposed for Use with BFG

Food type	**Use Levels for Related GRAS Notified Materials (GRN 343, 427, 458)**
Baked goods and baking mixes	§ 0.25-1.75% γ 3.0-9.0%; 2.4-3.0 g/serving
Beverages and beverage bases (in addition to beverage categories already listed)	γ 0.6-1.2%; 1.5-3.0 g/serving
Cheese (cheese, cream cheese, cottage cheese, imitation cheese, cheese mixtures, cheese soups)	§ 1.0-1.5% † 0.2-2.4 g/serving
Chocolate and non-chocolate candies and confections	**NA**
Coatings and breadings for meat poultry and vegetables	§ 1.0-3.0%
Custards, puddings and gelatin desserts	γ 2.4%; 2.4 g/serving † 0.2-2.4 g/serving
Dairy products like sour cream, spreads, etc.	§ 1.0-1.5%
Dips	§ 0.50-3.0%
Egg Products (omelets and frittatas)	§ 0.50-1.5%
Filling, baked goods	§ 1.5-3.0% γ 2.4%; 2.4 g/serving
Flavored and non-flavored soy milk	† 0.2-2.4 g/serving
Flavored milk and milk drinks, fluid	γ 0.6%; 1.08 g/serving † 0.2-2.4 g/serving
Frozen dairy desserts (e.g., frozen milk desserts, ice cream, frozen yogurt)	γ 2.4%; 2.4-3.0 g/serving † 0.2-2.4 g/serving

Food type	Use Levels for Related GRAS Notified Materials (GRN 343, 427, 458)
Grain products and pastas (including breakfast/nutrition/cereal bars, pasta)	γ 9.0%; 2.7 g/serving † 0.2-2.4 g/serving
Gravies	§ 1.5-3.0%
Isotonic beverages (fluid meal replacement drinks)	† 0.2-2.4 g/serving
Jams and jellies	γ 15%; 3.0 g/serving
Juice drinks and punch (powdered concentrates and ready-to-drink)	† 0.2-2.4 g/serving
Milk, dry, and powdered mixtures with dry milk, not reconstituted	† 0.2-2.4 g/serving
Plant-based dairy alternatives	**NA**
Plant-based meat substitutes	**NA**
Processed fruits and fruit juices, i.e., use in fruit juices for which US Standards of Identity do not prevent such use (citrus and non-citrus)	γ 0.6%; 1.5 g/serving † 0.2-2.4 g/serving
Processed vegetables and vegetable juices	γ 0.6%; 1.5 g/serving
Ready-to-drink milk-based and non-dairy meal replacements and Adult nutrition products (e.g., Ensure® Nutrition Shakes)	γ 1.2%; 3.0 g/serving † 0.2-2.4 g/serving
Ready-to-eat cereals, fortified	γ 9.0%; 2.7 g/serving † 0.2-2.4 g/serving
Salad dressings	§ 0.50-3.0%
Sauces	§ 1.5-3.0%
Smoothies and grain drinks	γ 0.6%; 1.5 g/serving
Snack foods [Functional use (crackers, popcorn, pretzels, corn chips)] [Fiber (vegetable chip, wheat thins)]	§ 0.50-1.5% γ 9.0%; 2.7 g/serving
Soups	§ 1.5-3.0%
Sports drinks	† 0.2-2.4 g/serving
Yogurt	γ 2.4%; 3 g/serving † 0.2-2.4 g/serving

† GRN 458 (XOS from powdered corncobs).
§ GRN 427 (corn hull fiber).
γ GRN 343 (wheat bran extract composed primarily of XOS and AXOS); all 'mL/serving' levels identified in GRN 343 were changed to 'g/serving' herein for clarification and consistency.

B. Estimated Daily Intake from Intended Uses

The proposed uses of BFG (corn bran arabinoxylan) are considered to be substitutional for current uses of similar GRAS Notified dietary fiber materials, such as corn hull fiber, xylo-oligosaccharides (XOS) and/or arabinoxylo-oligosaccharides (AXOS) derived from wheat, corn, or sugarcane. Therefore, the proposed uses of BFG are unlikely to further increase the intake of these dietary fiber materials.

As discussed in GRN 427 (FDA, 2012), AgriFiber Solutions, LLC (formerly Z Trim Holdings, Inc.) determined the mean and 90th percentile consumer estimated daily intake (EDI) for corn hull fiber from intended uses to be 13.5 and 27 g/day, respectively (providing a dietary fiber intake of up to 24.8 g/day based on 92% fiber content in corn hull fiber). This was a very conservative estimate derived through summation of the exposure amounts calculated for each individual food category. Using more refined methods of intake estimation (i.e., probabilistic modeling that predicts aggregate exposure from multiple categories), the EDIs for other GRAS Notified xylo-oligosaccharides (XOS) and/or arabinoxylo-oligosaccharides (AXOS) derived from wheat, corn, or sugarcane range from approximately 5.0 to 12.6 g/day at the mean and from approximately 10 to 21 g/day at the 90th percentile, as detailed below and discussed further in the respective GRNs (343, 458, 816) and associated FDA Letters of No Questions (FDA, 2010, 2013, 2019).

- GRN 427 [corn hull fiber]: Use levels of 0.25 to 3.0%; consumer EDIs of 13.5 to 27 g/day (Mean-90th)
- GRN 343 [wheat bran extract composed primarily of XOS and AXOS]: Use levels of 2.4 to 3.2 g/serving; consumer EDIs of 5.0-10.1 g/day (Mean-90th)
- GRN 458 [XOS from powdered corncobs]: Use levels of 0.2 to 2.4 g/serving; consumer EDIs of 5.1 to 9.8 g/day (Mean-90th)
- GRN 816 [XOS from sugarcane]: Use levels of 0.10 to 100 g/100 g; consumer EDIs of 12.6 to 20.7 g/day (Mean-90th)

Because the current proposed uses of BFG (i.e. corn bran arabinoxylan; use levels up to 3% for functional properties and 3.8 g/serving for most categories as a source of fiber) are similar to the uses of these previously GRAS Notified XOS and/or AXOS derived from wheat, corn, or sugarcane, estimated consumer exposure to BFG is also expected to be similar. We note that most product functionality is achieved with as little as 0.5% to 1.5% BFG in the food. Therefore, 0.5% to 1.5% BFG represents typical use levels and the maximum proposed use of 3% BFG when used as a formulation aid yields conservative consumer intake estimates. Consistent with the estimates given for the GRAS materials above, average and high-end consumer exposure to BFG is estimated to range from 5 to 27 g/day (providing a dietary fiber intake of up to 24.3 g/day based on the maximum 90% fiber content in BFG). However, as noted above, the 27 g/day intake estimate in GRN 427 is very conservative (derived via summation of intakes from each food category) and high-end intake of BFG is more realistically estimated to range between 10 to 21 g/day (as in GRNs 343, 458, 816). Only a few proposed BFG food categories are not included in one or more of these previous GRNs, such as plant-based dairy alternatives, plant-based meat substitutes, and chocolate and non-chocolate candies

and confections. These categories are not expected to substantially increase consumer intake of BFG beyond the estimates derived in previous GRNs. Additionally, although a broad listing of proposed food categories is identified herein for BFG, actual uses of the ingredient will be limited to a smaller subset of these categories in the short-term; therefore, the above estimates are considered to be conservative and likely overestimates of actual consumer intake of BFG.

C. Background Dietary Consumption of Arabinoxylan

As described in GRN 343 [FDA, 2010], the background dietary consumption of arabinoxylan can be estimated from the intake of cereal products. The estimated intakes of arabinoxylan from refined or whole grain ready-to-eat cereals were determined as 1.1-3.6 g/person/day (mean) and 2.0-6.8 g/person/day (90^{th} percentile), based on USDA, CSFII consumption data for ready-to-eat cereals (Smiciklas-Wright *et al*., 2002) and considering that the average arabinoxylan content of refined cereals is reported as 1.9% (Gebruers *et al*., 2008) and 6.5% in wholegrain cereals (Hashimoto *et al*., 1987; Hong *et al*., 1989; Saulnier *et al*., 1995b). The proposed use of BFG in fortified ready-to-eat cereals (3.8 g/serving) is consistent with these background exposure estimates, and cumulative intake of arabinoxylan from background consumption and proposed uses of BFG does not present a safety concern for the reasons described in the Discussion below.

D. Discussion

As an arabinoxylan, BFG meets the FDA's expanded definition of dietary fiber that includes arabinoxylan as one of the "Additional Isolated Non-Digestible Carbohydrates" (FDA, 2018). The FDA Recommended Daily Value (RDV) for dietary fiber is 28 g/day (FDA, 2020) and the Adequate Intake (AI) levels for fiber recommended by the Institute of Medicine (IOM) are 25 g per day for adult women and 38 g per day for adult men (IOM, 2002/2005). However, it is reported that Americans consume only one half of the recommended levels of fiber, at intakes around 15.9 g/day (King *et al*., 2012); thus, the addition of BFG to foods and beverages will help to achieve recommended fiber intakes.

The FDA's review of cell wall fibers (FDA, 2018) and GRNs for similar AXOS and XOS ingredients with uses comparable to those proposed for BFG (GRN 343, 427, 458, 816 [FDA, 2010, 2012, 2013, 2019)] has not resulted in any questions concerning their safety, and the maximum estimated daily intake of fiber from proposed uses of BFG (24.3 g fiber/day based on a maximum dietary fiber specification of 90%) is below the IOM and FDA recommended intake values. Therefore, there is no safety concern associated with the proposed uses of BFG with regards to fiber intake.

As discussed further in Section 6 (GRAS Narrative), BFG was determined to be safe and well tolerated at repeated daily doses of 25 g (females) or 35 g (males) for 6 weeks (Nguyen *et al*. 2020; Deehan *et al*., 2020a/b [*manuscripts in preparation*]; Deehan *et al*., 2021 [*unpublished report*]). As with other fermentable dietary fibers (Grabitske and Slavin, 2009; Kaur *et al*., 2018; Koecher *et al*., 2014; Livesey, 2001; Rumpagaporn *et al*., 2015; IOM, 2002), consumption of BFG at these high daily doses intensified gastrointestinal (GI) symptoms. However, effects were mild and transient, with ratings returning to baseline levels during weeks 4 to 6 (Deehan *et al*.,

2020b [*manuscripts in preparation*]; Deehan *et al*., 2021 [*unpublished report*]). No serious adverse events were observed in the BFG study group. In terms of non-serious adverse events, one individual consuming BFG (as well as one individual consuming the microcrystalline cellulose control) reported constipation within the first two weeks of the study, resulting in their withdrawal from the study (Nguyen *et al*. 2020; Deehan *et al*., 2021 [*unpublished report*]). The IOM recognizes that "while occasional adverse gastrointestinal symptoms are observed when consuming one of the isolated or synthetic fibers, serious chronic adverse effects have not been observed. Furthermore, due to bulking effects of fibers, excess consumption is likely to be self-limiting" (IOM, 2002). Therefore, an UL (Tolerable Upper Intake Level) was not set by IOM for these individual fibers.

In conclusion, even worst-case, conservatively estimated intake of BFG from proposed uses (i.e., up to 27 g/day, providing a dietary fiber intake of up to 24.3 g/day) is considered to be safe.

4. SELF-LIMITING LEVELS OF USE

This section of the GRAS conclusion fulfills requirements of 21 CFR §170.240 by providing information about any self-limiting characteristics of corn bran arabinoxylan (BFG) use.

There are no known self-limiting use levels of BFG for its intended use as a source of dietary fiber, as a formulation aid (e.g., binder and gelling agent), as a texturizer, and as a stabilizer and thickener (e.g., emulsifier) within select foods and beverages.

5. EXPERIENCE BASED ON COMMON USE IN FOOD BEFORE 1958

General recognition of safety for the notified substance, corn bran arabinoxylan (BFG), is established through scientific procedures; therefore, information regarding experience based on common use of the notified substance in food prior to 1958 is not applicable.

6. BASIS FOR CONCLUSION OF GRAS STATUS FOR CORN BRAN ARABIONOXYLAN (BFG) (NARRATIVE)

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

A. Introduction

The subject of this GRAS conclusion, corn bran arabinoxylan (BFG), is a soluble arabinoxylan (AX) isolated from corn bran.

AXs are a constituent of dietary fiber belonging to the broad category of non-starch polysaccharides and specifically hemicelluloses (Grootaert *et al*., 2007; FDA, 2018; Serra *et al*., 2020). They are one of the main dietary fibers found in the cell walls of cereal grains, such as corn, wheat, rye, rice, sorghum, and millet, as well as other grasses, such as psyllium, flax, and bamboos (Izydorczyk and Biliaderis, 2007). AXs consist of a β-(1,4)-linked D-xylopyranose backbone to which α-l-arabinofuranose residues are attached as side chains (Grootaert *et al*., 2007; EFSA, 2011; Serra *et al*., 2020; Kale *et al*., 2018; FDA, 2018). Some AXs are also substituted with ferulic acid and other phenolic compounds that are covalently linked (Grootaert *et al*., 2007; EFSA, 2011). A large degree of structural heterogeneity is imparted by the presence of other sugar moieties, including xylose, galactose, and glucuronic acid in the branches (Kale *et al*., 2018). The structural complexity of AX varies greatly by source. For instance, rice and sorghum AXs have relatively simple structures (widely distributed, single sugar arabinose branches), while corn bran AXs have highly branched and very complex structures (Kale *et al*., 2018; Hamaker and Tuncil, 2014).

As discussed further below, AXs are degraded in the colon by specialized microbes that encode AX-degrading glycosidase, such as β-xylosidase and α-arabinofuranosidase, within their genomes (Nguyen *et al*., 2020). Degradation of AX by these microbes releases arabinoxylan oligosaccharides (AXOS) as the major hydrolysis product, as well as xylooligosaccharides (XOS) and individual sugar moieties (i.e., arabinose and xylose), for further degradation by secondary fermenters (Grootaert *et al*., 2007; Broekaert *et al*., 2011; Nguyen *et al*., 2020). Therefore, the regulatory status and safety profile of AXOS and XOS are considered relevant to the GRAS assessment of corn bran AX (BFG).

In 2018, the US FDA included AX among the list of eight additional non-digestible carbohydrates that meet the Agency's definition of dietary fiber, including AX alone or as a constituent of mixed plant cell wall fiber ingredients isolated from cereal grains, along with celluloses, pectins, lignins, and/or β-glucans. FDA's decision to include AX in the definition of dietary fiber was supported by the strength of the evidence demonstrating that AX can induce beneficial physiological effects on blood glucose and insulin levels (FDA, 2018). The EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA) similarly concluded that a cause and

effect relationship has been established between the consumption of wheat endosperm derived AX and reductions in post-prandial glycaemia; thus, advising that 8 g of AX-rich fiber produced from the wheat endosperm per 100 g of available carbohydrates should be consumed by individuals who wish to reduce their post-prandial glycaemic response (EFSA, 2011). The human clinical studies reviewed by FDA and EFSA are summarized below in "Clinical Safety Evidence for Corn Bran Arabinoxylan (BFG)".

The FDA (2018) has noted the existence of several GRAS Notifications for isolated plant cell wall fibers. These include GRAS Notices Nos. 366 (oat hull fiber), 368 (corn hull fiber [*resubmitted as GRN 427*]), 373 (rice bran fiber), 430 (sugar beet fiber), 478 (rice hull fiber), 525 (pea fiber), and 599 (citrus fiber), all of which have received FDA Letters of No Questions. In addition to the 2018 FDA review, GRAS Notifications for AXOS and XOS (the major hydrolysis products of AX) derived from corn, wheat, and sugarcane have also received Letters of No Questions from FDA (e.g., GRN 427 [FDA, 2012]; GRN 343 [FDA, 2010], GRN 458 [FDA, 2013], GRN 816 [FDA, 2019]). Furthermore, the EFSA NDA Panel concluded in 2018 that XOS were safe under the proposed uses and use levels as novel food pursuant to Regulation (EU) 2015/2283.

B. Literature Search Strategy

To support the current GRAS assessment for the proposed uses of corn bran arabinoxylan (AX; BFG), a targeted literature search was performed in January 2021 by Toxicology Regulatory Services (TRS) using the National Library of Medicine (NLM) PubMed database, as well as subscription-based literature databases (i.e., ToxPlanet, Timberlake Ventures, Inc.) to identify relevant safety data and information for AX, AXOS, and XOS. The primary search was performed for all relevant publications to date with application of the PubMed Toxicology Subset filter[1]. A secondary search was performed for all publications between 2018-2020 in order to capture literature published following the FDA 2018 review and recent GRAS Notifications for AXOS and XOS. Publications considered relevant to the current GRAS assessment are summarized or cited in the subsections below, including metabolism, toxicology, and clinical safety evidence for AX, AXOS, XOS and BFG (corn bran AX). As human clinical safety data for AX, AXOS, and XOS are abundant, studies were excluded from the current literature review when the potential physiologic effects of these materials were assessed by using *in vitro* test systems or animal models.

C. Metabolism and Toxicology Profile of Arabinoxylan and BFG

Metabolism

Corn bran arabinoxylan (corn bran AX; BFG) is expected to be degraded in the colon by specialized microbes (e.g., *Bifidobacterium longum*) that encode AX-degrading glycosidase within their genomes, releasing AXOS as the major hydrolysis product (Nguyen *et al*., 2020). AXOS undergo further fermentation in the colon by secondary fermenters, which contributes to

[1] https://www.nlm.nih.gov/bsd/pubmed_subsets/tox_strategy.html

the net formation of hydrogen, carbon dioxide, and beneficial short-chain fatty acids (SCFA), primarily acetate, propionate, and butyrate (Grootaert *et al*., 2007; Broekaert *et al*., 2011; Nguyen *et al*., 2020). While gases are excreted by breath or as flatulence, SCFA are absorbed and primarily used for energy; however, other beneficial physiological effects of SCFA have been described (Deehan *et al*., 2017). The fermentation of AXOS is also associated with the release and absorption of ferulic acid (François *et al*., 2010; Napolitano *et al*., 2009). Both SCFA and ferulic acid are considered to be benign well-metabolized digestion products that are also produced upon digestion of natural plant-derived fibers present in a regular healthy diet rich in cereals, fruits, and vegetables (François *et al*., 2010). Therefore, metabolism of corn bran AX (BFG) does not raise safety concerns.

Toxicology

As a commonly consumed constituent of dietary fiber, traditional toxicology studies have not been performed on cereal derived AX including BFG. Acute toxicity studies of AX isolated from Ispaghula (*Plantago ovata*) husk have been performed in male and female Swiss albino mice and White albino rabbits orally exposed to AX at doses up to 10 g/kg (mice) or 5 g/kg (rabbits) and observed for a period of 14 days (Erum *et al*., 2015). There were no significant changes in water and food consumption and no mortality reported. Body weights of the mice and rabbits decreased initially with a gradual increase until day 14, when they were similar to control values. Relative organ weights were found to be normal, and hematological biochemical and histopathological examination did not show any significant changes when compared to controls ($p > 0.05$).

To support the safety assessment and GRAS evaluation of wheat bran extract (WBE) containing AXOS (i.e., GRN 343), mutagenicity, clastogenicity, and 90-day rat-feeding studies were performed on WBE containing 80% AXOS (François *et al*., 2010). Because AXOS are the major hydrolysis products of AX, these toxicology data are relevant to AX and support the GRAS conclusion for corn bran AX (BFG). There was no evidence of mutagenic or clastogenic activity with WBE in the bacterial reverse mutagenicity assay (Ames test) (OECD Testing Guideline 471) or the *in vitro* chromosome aberration assay on Chinese hamster lung fibroblast cells (OECD Testing Guideline 473) (François *et al*., 2010). In the subchronic toxicity study performed in accordance with OECD Testing Guideline 408, Wistar Crl:(WI BR) rats (10 animals/sex/group) were fed a semisynthetic diet (AIN 93G) containing 0.3%, 1.5%, or 7.5% WBE for 13 weeks, corresponding to an average intake of 0.2, 0.9, and 4.4 g/kg body weight per day. There were no treatment related adverse effects observed in the WBE treatment groups and the no-observed-adverse-effect level (NOAEL) for WBE was determined to be 7.5%, the highest dose tested, equivalent to a daily average intake of 4.4 g/kg body weight per day (François *et al*., 2010).

Additional toxicology studies on XOS were reviewed by FDA (2013) in its evaluation of GRN 458 for XOS from powdered corncobs, and by EFSA (2018) in its safety assessment of XOS as a novel food pursuant to Regulation (EU) 2015/2283. The NOAEL for XOS determined in a 13-week study in Sprague-Dawley rats was 11.5 g/kg and 15 g/kg body weight per day for males and females, respectively, the highest doses tested (FDA, 2013; EFSA, 2018; Gao et al., 2012).

In a 26-week study in Beagle dogs that were given daily XOS doses (6 days/week) of 1.25, 2.5 and 5 g/kg body weight per day (Gao *et al*., 2017), occasional vomiting and loose stools in the mid and/or high dose groups were observed and were attributed to the consumption of very high doses of a non-digestible carbohydrate substance (EFSA, 2018).

As described above, BFG (corn bran AX) has an arabinose-to-xylose (A/X) ratio around 0.84 to 0.88 (Table 4) with sections of the arabinoxylan chain further substituted with glucuronic acid and ferulic acid, which is indicative of a heavily branched structure with complex side chains (Izydorczyk and Biliaderis, 2007; Nguyen *et al*., 2020; Rose, *et al.*, 2010; Saulnier *et al.*, 1995a). The ratio of arabinose to xylose is noted to vary (e.g. typically from 0.3 to 1.1) among arabinoxylans derived from different grains, which correlates with the degree of branching and possibly to the rate of fermentation by gut microbiota (Izydorczyk and Biliaderis, 2007; Rose *et al.,* 2010). An average A/X ratio of 0.20 was reported for XOS and AXOS from wheat bran extract (GRN 343) while an A/X ratio 0.60 was reported for AX-rich fiber from wheat (as tested in the clinical study by Lu *et al*. (2000), discussed below). In the study by Rose *et al.* (2010), changes in A/X ratio during *in vitro* fecal fermentation of alkali-soluble corn bran, rice bran, and wheat bran suggested that maize and rice bran arabinoxylans are degraded by a debranching mechanism, while wheat bran arabinoxylans are degraded by a two-phase mechanism. A substantially higher A/X ratio was determined for the rice bran arabinoxylan (~1.0; visual estimation) compared to corn bran arabinoxylan (~0.5; visual estimation) initially, indicating a more highly branched nature of the rice bran arabinoxylans compared to the corn bran arabinoxylans (Rose *et al.*, 2010). As such, bacteria were required to cleave the arabinose moieties from the rice bran arabinoxylans prior to utilizing the xylose moieties, while for corn bran arabinoxylans, both arabinose and xylose moieties were utilized simultaneously (Rose *et al*., 2010). Considering that the A/X ratio for BFG is within the typical 0.3 to 1.1 range of variability for arabinoxylans derived from grains, , the branching structure may impact the rate/pattern of microbial fermentation following oral consumption; however, the A/X ratio of BFG would not impact safety.

D. Clinical Safety Evidence for Arabinoxylan and BFG

Arabinoxylan (AX) and its major hydrolysis products, AXOS and XOS, have been studied extensively in humans for potential beneficial effects on gastrointestinal health parameters, as well as metabolic markers of obesity and diabetes.

Clinical Studies on Arabinoxylan

In their 2018 Review of the Scientific Evidence on the Physiological Effects of Certain Non-Digestible Carbohydrates, the US FDA (2018) reviewed six studies evaluating the effect of AX on blood glucose and insulin levels in human volunteers. Garcia et al. (2006/2007) reported on a randomized, single-blind, controlled, cross-over intervention study in which 11 overweight women and men with impaired glucose tolerance consumed white bread rolls that alternately contained no AX (control) or that were supplemented with AX totaling 15 g AX/day for six weeks, with a six-week washout period in between. Hartvigesen et al. (2014a) reported on an acute, randomized, cross-over intervention study in which 15 Danish women and men with metabolic syndrome consumed a meal that alternately provided 50 g of digestible carbohydrate

(control) or 6 g of added AX after an overnight fast. Blood samples were drawn at various time points up to 270 minutes. Hartvigesen et al. (2014b) reported on an acute, randomized, cross-over intervention study in which 15 Danish women and men with metabolic syndrome consumed a meal that alternately provided 50 g of digestible carbohydrate (control) or 2.6 g of added AX after an overnight fast. Blood samples were drawn at various time points up to 360 minutes. Lu et al. (2000) reported on a randomized, cross-over design study in which 14 healthy Australian women and men consumed three isoenergetic breakfasts of bread, margarine, and jam providing 75 g of available carbohydrates containing either 0 g (control), 6 g, or 12 g of AX after an overnight fast. Lu et al. (2004) reported on a randomized, cross-over intervention study in which 15 Australian women and men with type II diabetes consumed their normal diet supplemented with bread and muffins (50% whole wheat and 50% white flour) (control) or with bread and muffins (50% whole wheat, 36% white flour) that contained 15 g of AX for five weeks each. Both the control and treatment bread and muffins contained the same amount of available carbohydrate. Mohlig et al. (2004) reported on a cross-over design study in which 15 German women and men consumed a breakfast with 0 g (control) and 6 g of AX, after which blood glucose levels were measured up to 120 minutes. FDA did not report any adverse events associated with any of these studies.

The two studies that measured fasting blood glucose levels showed a statistically significant reduction in individuals with impaired glucose tolerance or with type 2 diabetes at an intake level of 15 g of AX (Garcia *et al*., 2006/2207; Lu *et al*., 2004). A significant reduction in the AUC for post-prandial glucose was demonstrated in three of four studies that provided 2.6 g, 6 g, and 12 g of AX to healthy individuals or individuals with impaired glucose tolerance (Garcia *et al*., 2006/2007; Hartvigesen *et al*. 2014b; Lu *et al*., 2000). One study demonstrated a dose-response effect (6 g and 12 g) of AX on post-prandial glucose levels in healthy subjects (Lu *et al*., 2000). One study demonstrated that AX consumption reduced blood glucose in an oral glucose tolerance test when type 2 diabetics were given 15 g of AX (Lu *et al*., 2004). Three studies showed that AX consumption (6 g, 12 g, and 15 g) lowered post-prandial insulin levels (Garcia *et al*., 2006/2007; Lu *et al*., 2000; Möhlig *et al*., 2004). Attenuation of post-prandial glycemic response has been linked to a reduced risk of developing type II diabetes and cardiovascular disease (Augustin *et al*., 2015). In consideration of these studies, FDA concluded that the strength of the evidence supports that AX have a beneficial physiological effect on blood glucose and insulin levels (FDA, 2018).

Additional clinical studies on AX that were not part of the FDA (2018) review include studies evaluating the effects of Biobran/MGN-3, an arabinoxylan concentrate from rice bran, on health-related quality of life in older healthy adults, NK cell activity in geriatric subjects, viremia level in patients with chronic HCV infection, and cancer treatment therapy (Elsaid *et al*., 2018/2020; Ooi *et al*., 2018; Salama *et al*., 2016). There were no side effects observed at the Biobran/MGN-3 doses evaluated by Elsaid *et al*., (2018/2020) (i.e., 500 mg/day for 30 days; 250 mg/day for 3 months) or Salama *et al*. (2016) (i.e., 1 g/day for 3 months), and no reported adverse events from Biobran/MGN-3 in the 11 clinical studies reviewed by Ooi *et al*. (2018).

Clinical Study on Corn Bran Arabinoxylan (BFG)

In a randomized, parallel two-arm, controlled trial in 31 male and female adults with overweight and class-I obesity, corn bran AX (BFG), which contained 81.0 ± 1.3% soluble AX, was determined to be safe and well tolerated at repeated daily doses of 25 g (females) or 35 g (males) for 6 weeks (Nguyen *et al*., 2020; Deehan *et al*., 2020a/b [*manuscripts in preparation*]; Deehan *et al*., 2021 [*unpublished report*]). Participants consumed microcrystalline cellulose (control) or BFG as a powdered supplement (25 g for females and 35 g for males) incorporated into subject-preferred foods and drinks, with participants also receiving guidance on incorporating the fibers into foods so as to ease high-dose supplementation. Blood and/or fecal samples were collected during the baseline visit, after one week of treatment, and during the sixth week of treatment. Gastrointestinal symptoms were assessed at baseline and weekly during the intervention by completing a symptoms diary. Adverse events were assessed at the beginning of each clinic visit. Safety related clinical measurements included body weight, blood pressure, complete blood count (red blood cells, hemoglobin, hematocrit, mean corpuscular volume, mean corpuscular hemoglobin concentration, red cell distribution width, white blood cells, and platelets), blood glucose and insulin, and lipid profile (triglycerides, total cholesterol, low-density lipoprotein (LDL) cholesterol, and high-density lipoprotein (HDL) cholesterol).

No significant changes in the BFG treatment group were observed in the measured complete blood count parameters as compared to the microcrystalline cellulose control group (non-fermentable control). As with other fermentable dietary fibers (Grabitske and Slavin, 2009; Kaur *et al*., 2011; Koecher *et al*., 2014; Livesey, 2001; Rumpagaporn *et al*., 2015; IOM, 2002), consumption of BFG at these high daily doses intensified gastrointestinal symptoms. However, effects were mild and transient, with ratings returning to baseline levels during weeks 4 to 6 (Deehan *et al*., 2020b [*manuscript in preparation*]; Deehan *et al*., 2021 [*unpublished report*]). No serious adverse events were observed in the BFG study group. In terms of non-serious adverse events, one individual consuming BFG and one individual consuming microcrystalline cellulose reported constipation within the first two weeks of the study, resulting in their withdrawal from the study (Nguyen *et al*., 2020; Deehan *et al*., 2021 [*unpublished report*]). The IOM recognizes that "while occasional adverse gastrointestinal symptoms are observed when consuming one of the isolated or synthetic fibers, serious chronic adverse effects have not been observed. Furthermore, due to bulking effects of fibers, excess consumption is likely to be self-limiting" (IOM, 2002). Therefore, an UL (Tolerable Upper Intake Level) was not set by the IOM for these individual fibers.

Clinical Studies on Arabinoxylan Oligosaccharides

Published clinical safety evidence on AXOS and XOS include studies evaluating their effects on gastrointestinal health parameters and metabolic markers in overweight individuals (François *et al*., 2012; François *et al*., 2014; Christensen *et al*., 2020; Kjølbæk *et al*., 2020). AXOS-rich WBE (containing 79% AXOS) at doses of 5 g/day for 3 weeks was well tolerated in children and not associated with adverse effects (François *et al*., 2014). No serious adverse effects were observed following AXOS-rich WBE or AXOS doses of 10 g/day for 3 weeks (François *et al*., 2012) and 10.4 g/day for 4 weeks (Christensen *et al*., 2020; Kjølbæk *et al*., 2020), although mild

symptoms of increased flatulence were reported more frequently during AXOS intake (François *et al*., 2012; Christensen *et al*., 2020; Kjølbæk *et al*., 2020).

In a study by Walton *et al.* (2012), no adverse effects on gastrointestinal symptoms were reported in healthy volunteers following consumption of AXOS-enriched bread (total intake of 2.2 g AXOS/day) for 21 days.

In EFSA's 2018 review of XOS as a novel food, the NDA Panel noted that human intervention studies with XOS (Xiao *et al*., 2012; Finegold *et al*., 2014; Yang *et al*., 2015) indicate the occurrence of acute and transient gastrointestinal effects at the beginning of the consumption of XOS at doses of 10-12 g/day. These effects have also been associated with the consumption of other non-digestible carbohydrates; therefore, the EFSA NDA Panel considered that the available human data do not raise safety concerns in relation to proposed uses of XOS. As discussed in GRN 458, the incidence of diarrhea in the high-dose XOS treatment group (8-12 g per day) evaluated by Xiao *et al.* (2012) was similar to the maltodextrin control group (GRN 458; FDA, 2013). The maximum level of XOS that does not cause gastrointestinal symptoms in men was reported to be 7.2 g/person/day (Oku *et al*., 2002) [as cited in GRN 458; FDA, 2013]).

In summary, a large body of clinical safety evidence exists for AX and AXOS (the major hydrolysis products of AX), with the only side effects noted related to transient gastrointestinal effects that are commonly seen with other non-digestible carbohydrates and expected to be self-limiting. BFG specifically was determined to be safe and well tolerated at doses of 25 g (females) or 35 g (males) for 6 weeks (Nguyen et al. 2020; Deehan et al., 2020a/b [manuscripts in preparation]; Deehan et al., 2021 [unpublished report]).

E. Allergenicity

Corn bran arabinoxylan (BFG) does not contain any of the eight allergens that are considered to be major food allergens under the United States Food Allergen Labelling and Consumer Protection Act of 2004 (FALCPA). Products containing BFG may be labeled appropriately to inform consumers to the presence of corn derived ingredients.

F. Safety Summary and GRAS Conclusion

Corn bran arabinoxylan (corn bran AX; BFG) shows structural similarities with those AXs commonly consumed in the diet and meets the FDA's expanded definition of dietary fiber (FDA, 2018).

Corn bran AX (BFG) is expected to be degraded in the colon by specialized microbes that encode AX-degrading glycosidase within their genomes, releasing AXOS as the major hydrolysis product (Nguyen *et al*., 2020). AXOS undergo further fermentation in the colon by secondary fermenters, which contributes to the net formation of hydrogen, carbon dioxide, and beneficial short-chain fatty acids (SCFA), primarily acetate, propionate, and butyrate (Grootaert *et al*., 2007; Broekaert *et al*., 2011; Nguyen *et al*., 2020). The fermentation of AXOS is also

associated with the release and absorption of ferulic acid (François *et al*., 2010; Napolitano *et al*., 2009). Both SCFA and ferulic acid are considered to be benign well-metabolized digestion products that are also produced upon digestion of natural plant-derived fibers present in a regular healthy diet rich in cereals, fruits, and vegetables (François *et al*., 2010). Therefore, the metabolism of BFG does not raise safety concerns.

Based on the published data for AX and AXOS (the major hydrolysis products of AX), there is no concern for genotoxicity or mutagenicity of BFG and no systemic toxicity is expected to follow ingestion of BFG.

A large body of clinical safety evidence exists for AX and AXOS (the major hydrolysis products of AX), with the only side effects noted related to transient gastrointestinal effects that are commonly seen with other non-digestible carbohydrates and expected to be self-limiting. BFG specifically was determined to be safe and well tolerated at doses of 25 g (females) or 35 g (males) for 6 weeks (Nguyen *et al*. 2020; Deehan *et al*., 2020a/b [*manuscripts in preparation*]; Deehan *et al*., 2021 [*unpublished report*]).

As discussed in Section 3, the average and high-end consumer consumption of BFG is conservatively estimated to range from 5 to 27 g/day (providing a dietary fiber intake of up to 24.3 g/day based on the maximum 90% fiber content in BFG) based on calculated exposure estimates for similar XOS and/or AXOS ingredients concluded to be GRAS for uses comparable to those proposed for BFG. These conservative intake estimates for BFG are supported by available published safety data for AX, corn bran AX (BFG), AXOS and XOS. Further, the FDA's 2018 review of cell wall fibers (including AX) and GRNs for similar AXOS and/or XOS ingredients has not resulted in any questions concerning their safety, and the maximum estimated daily intake of fiber from proposed uses of BFG (22.7 g fiber/day) is below the current IOM (2002/2005) and FDA (2020) recommended intake values.

In summary, the totality of scientific evidence from publicly available information relevant to the safety of corn bran AX (BFG), including identity, specifications, manufacturing process, probable consumer exposure, ADME and toxicology profile, and clinical safety evidence, provides a basis upon which to conclude that there is a reasonable certainty that BFG, produced in accordance with current Good Manufacturing Practice, is not harmful under the proposed intended conditions of use. The safety data supporting this conclusion are known and accepted by a consensus of qualified experts in the general scientific community (refer to Exhibit II, GRAS Expert Panel Report). This not only assures that the intended uses of BFG described herein are safe, but also corroborates the conclusion that BFG is generally recognized as safe (GRAS) under the proposed conditions of use.

TRS is not aware of any information that would be inconsistent with the conclusion that the proposed uses of corn bran AX (BFG), meeting appropriate specifications and used according to current Good Manufacturing Practice, are GRAS.

7. REFERENCES

Note: All references listed herein may be considered *generally available* with the exception of the supplemental Unpublished Report (Deehan *et al*. 2021) prepared for AgriFiber Solutions, LLC.

Augustin LS, Kendall CW, Jenkins DJ, Willett WC, Astrup A, Barclay AW, Björck I, Brand-Miller JC, Brighenti F, Buyken AE, Ceriello A, La Vecchia C, Livesey G, Liu S, Riccardi G, Rizkalla SW, Sievenpiper JL, Trichopoulou A, Wolever TM, Baer-Sinnott S, Poli A. 2015. Glycemic index, glycemic load and glycemic response: An International Scientific Consensus Summit from the International Carbohydrate Quality Consortium (ICQC). Nutrition, Metabolism and Cardiovascular Disease. 25:795-815. doi: 10.1016/j.numecd.2015.05.005. [As cited in: FDA, 2018]

Broekaert WF, Courtin CM, Verbeke K, Van de Wiele T, Verstraete W, Delcour JA. 2011. Prebiotic and Other Health-Related Effects of Cereal-Derived Arabinoxylans, Arabinoxylan-Oligosaccharides, and Xylooligosaccharides. Critical Reviews in Food Science and Nutrition. 51:2: 178-194.

Christensen L, Sørensen CV, Wøhlk FU, Kjølbæk L, Astrup A, Sanz Y, Hjorth MF, Benítez-Páez A. 2020. Microbial enterotypes beyond genus level: Bacteroides species as a predictive biomarker for weight change upon controlled intervention with arabinoxylan oligosaccharides in overweight subjects. Gut Microbes. 12(1):1847627. doi: 10.1080/19490976.2020.1847627.

Deehan EC, Duar RM, Armet AM, Perez-Muñoz ME, Jin M, Walter J. 2017. Modulation of the gastrointestinal microbiome with non-digestible fermentable carbohydrates to improve human health. Microbiology Spectrum. 5(5). doi: 10.1128/microbiolspec.BAD-0019-2017.

Deehan EC, Zhang Z, Riva A, Armet AM, Nguyen NK, Perez-Muñoz ME, Krysa JA, Seethaler B, Zhao YY, Cole J, Li F, Hausmann B, Spittler A, Laville M, Delzenne NM, Curtis JM, Wismer WV, Proctor SD, Bakal JA, Bischoff SC, Knights D, Field CJ, Berry D, Prado CM, Walter J. 2020a. Elucidating the role of the gut microbiota in the physiological effects of dietary fiber in adults with excess body weight. *Manuscript in preparation*.

Deehan EC, Zhang Z, Nguyen NK, Perez-Muñoz ME, Riva A, Cole J, Berry D, Prado CM, Walter J. 2020b. Gastrointestinal tolerance to high doses of arabinoxylan is dependent on the gut microbiota. *Manuscript in preparation*. [As cited in: Deehan *et al.*, 2021 (*Unpublished report*)]

Deehan EC, Zhang Z, Walter J. 2021. Clinical and gastrointestinal assessment of corn bran isolated arabinoxylan in adults with overweight and obesity. *Unpublished Report prepared for AgriFiber Solutions, LLC.*

EFSA (European Food Safety Authority). 2011. Scientific Opinion on the substantiation of health claims related to arabinoxylan produced from wheat endosperm and reduction of post-prandial glycaemic responses (ID 830) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Journal. 9(6):2205. doi: 10.2903/j.efsa.2011.2205

EFSA (European Food Safety Authority). 2018. Safety of xylo-oligosaccharides (XOS) as a novel food pursuant to Regulation (EU) 2015/2283. EFSA Journal. 16(7):5361. doi: 10.2903/j.efsa.2018.5361

Elsaid AF, Fahmi RM, Shaheen M, Ghoneum M. 2020. The enhancing effects of Biobran/MGN-3, an arabinoxylan rice bran, on healthy old adults' health-related quality of life: a randomized, double-blind, placebo-controlled clinical trial. Quality of Life Research. 29(2):357-367. doi: 10.1007/s11136-019-02286-7.

Elsaid AF, Shaheen M, Ghoneum M. 2018. Biobran/MGN-3, an arabinoxylan rice bran, enhances NK cell activity in geriatric subjects: A randomized, double-blind, placebo-controlled clinical trial. Experimental and Therapeutic Medicine. 15(3):2313-2320. doi: 10.3892/etm.2018.5713.

Erum A, Bashir S, Saghir S, Ruqia Tulain U, Saleem U, Nasir M, Kanwal F, Hayat malik MN. 2015. Acute toxicity studies of a novel excipient arabinoxylan isolated from Ispaghula (*Plantago ovata*) husk. Drug and Chemical Toxicology. 38:3, 300-305, DOI: 10.3109/01480545.2014.956219

FDA (US Food and Drug Administration). 2010. Agency Response to GRN 343. Letter of No Questions dated Nov 22, 2010. https://wayback.archive-it.org/7993/20171031012303/https://www.fda.gov/Food/IngredientsPackagingLabeling/GRAS/NoticeInventory/ucm235936.htm

FDA (US Food and Drug Administration). 2012. Agency Response to GRN 427. Letter of No Questions dated September 12, 2012. https://wayback.archive-it.org/7993/20171031010105/https://www.fda.gov/Food/IngredientsPackagingLabeling/GRAS/NoticeInventory/ucm323888.htm

FDA (US Food and Drug Administration). 2013. Agency Response to GRN 458. Letter of No Questions dated Aug 23, 2013. https://wayback.archive-it.org/7993/20171031005345/https://www.fda.gov/Food/IngredientsPackagingLabeling/GRAS/NoticeInventory/ucm368038.htm

FDA (US Food and Drug Administration). 2018. Review of the Scientific Evidence on the Physiological Effects of Certain Non-Digestible Carbohydrates. Scientific review. https://www.fda.gov/media/113659/download

FDA (US Food and Drug Administration). 2019. Agency Response to GRN 816. Letter of No Questions dated Apr 29, 2019.
https://www.fda.gov/media/129545/download

FDA (US Food and Drug Administration). 2020. Daily Value on the New Nutrition and Supplement Facts Labels. Content current as of May 05, 2020. https://www.fda.gov/food/new-nutrition-facts-label/daily-value-new-nutrition-and-supplement-facts-labels

Finegold SM, Li Z, Summanen PH, Downes J, Thames G, Corbett K, Dowd S, Krak M, Heber D. 2014. Xylooligosaccharide increases bifidobacteria but not lactobacilli in human gut microbiota. Food and Function. 5:436–445. doi: 10.1039/c3fo60348b. [As cited in: EFSA, 2018]

François IE, Lescroart O, Veraverbeke WS, Kubaszky R, Hargitai J, Esdaile DJ, Beres E, Soni MG, Cockburn A, Broekaert WF. 2010. Safety Assessment of a Wheat Bran Extract Containing Arabinoxylan-Oligosaccharides: Mutagenicity, Clastogenicity, and 90-Day Rat-Feeding Studies. International Journal of Toxicology. 29(5) 479-495

François IE, Lescroart O, Veraverbeke WS, Marzorati M, Possemiers S, Evenepoel P, Hamer H, Houben E, Windey K, Welling GW, Delcour JA, Courtin CM, Verbeke K, Broekaert WF. 2012. Effects of a wheat bran extract containing arabinoxylan oligosaccharides on gastrointestinal health parameters in healthy adult human volunteers: a double-blind, randomised, placebo-controlled, cross-over trial. British Journal of Nutrition. 108(12):2229-42. doi: 10.1017/S0007114512000372.

François IE, Lescroart O, Veraverbeke WS, Marzorati M, Possemiers S, Hamer H, Windey K, Welling GW, Delcour JA, Courtin CM, Verbeke K, Broekaert WF. 2014. Effects of wheat bran extract containing arabinoxylan oligosaccharides on gastrointestinal parameters in healthy preadolescent children. Journal of Pediatric Gastroenterology and Nutrition. 58(5):647-53. doi: 10.1097/MPG.0000000000000285.

Gao Y, Wang Y, Li Y, Han R, Li C, Xiao L, Cho S, Ma Y, Fang C, Lee AW. 2017. Repeated sub-chronic oral toxicity study of xylooligosaccharides (XOS) in dogs. Regulatory Toxicology and Pharmacology. 86:379–385. doi: 10.1016/j.yrtph.2017.04.009. [As cited in: EFSA, 2018]

Gao Y, Zhang S, Li C, Xiao L, Shen J, Yin J. 2012. Acute and subchronic toxicity of xylo-oligosaccharide in mice and rats. Toxicology Mechanisms and Methods. 22(8):605–610. doi: 10.3109/15376516.2012.706837. [As cited in: EFSA, 2018]

Garcia AL, Otto B, Reich SC, Weickert MO, SteinigerJ, Machowetz A, Rudovich NN, Möhlig M, Katz N, Speth M, Meuser F, Doerfer J, Zunft HJF, Pfeiffer AHF, Koebnick C. 2007. Arabinoxylan consumption decreases postprandial serum glucose, serum insulin and plasma total ghrelin response in subjects with impaired glucose tolerance. European Journal of Clinical Nutrition 61(3):334–341. doi: 10.1038/sj.ejcn.1602525. [As cited in: FDA, 2018]

Garcia AL, Steiniger J, Reich SC, Weickert MO, Harsch I, Machowetz A, Mohlig M, J Spranger, Rudovich NN, Meuser F, Doerfer J, Katz N, Speth M, Zunft HJF, Pfeiffer AHF, Koebnick C. 2006. Arabinoxylan fibre consumption improved glucose metabolism, but did not affect serum adipokines in subjects with impaired glucose tolerance. Hormone Metabolic Research. 38(11):761-766. doi: 10.1055/s-2006-955089. [As cited in: FDA, 2018]

Gebruers K, Domez E, Boros D, Fras A, Dynkowska W, Bedo Z, Rakszegi M, Delcour JA, Courtin, C.M. 2008. Variation in the content of dietary fiber and components thereof in wheats in the HEALTHGRAIN Diversity Screen. Journal of Agricultural and Food Chemistry. 56: 9740-9749. [As cited in: GRN 343]

Grabitske HA, Slavin JL. Gastrointestinal effects of low-digestible carbohydrates. 2009. Critical Reviews in Food Science and Nutrition. 49(4):327-60. [As cited in: Deehan *et al.*,2021 (Unpublished report)]

Grootaert C, Delcour JA, Courtin CM, Broekaert, WF, Verstraete W, Van de Wiele T. 2007. Microbial metabolism and prebiotic potency of arabinoxylan oligosaccharides in the human intestine. Trends in Food Science and Technology. 18(2):64-71. 10.1016/j.tifs.2006.08.004. [As cited in: FDA, 2018]

Hamaker BR and Tuncil YE. 2014. A perspective on the complexity of dietary fiber structures and their potential effect on the gut microbiota. Journal of Molecular Biology. 426(23): 3838-3850. doi: 10.1016/j.jmb.2014.07.028.

Hartvigsen ML, Gregersen S, Lærke HN, Holst JJ, Bach Knudsen KE, Hermansen K. 2014a. Effects of concentrated arabinoxylan and β-glucan compared with refined wheat and whole grain rye on glucose and appetite in subjects with the metabolic syndrome: a randomized study. Eur J Clin Nutr. 68(1):84-90. doi: 10.1038/ejcn.2013.236. [As cited in: FDA, 2018]

Hartvigesen ML, Lærke HN, Overgaard A, Holst JJ, Bach Knudsen KE, Hermansen K. 2014b. Postprandial effects of test meals including concentrated arabinoxylan and whole grain rye in subjects with the metabolic syndrome: a randomised study. European Journal of Clinical Nutrition. 68(5):567–574. doi: 10.1038/ejcn.2014.25. [As cited in: FDA, 2018]

Hashimoto S, Shogren MD, Pomeranz Y. 1987. Cereal pentosans: their estimation and significance. I. Pentosans in wheat and milled wheat products. Cereal Chemistry. 64: 30-34. [As cited in: GRN 343]

Hong BH, Rubenthaler GL, Allan RE. Wheat pentosans. 1989. I. Cultivar variation and relationship to kernel hardness. Cereal Chemistry. 66, 369-373. [As cited in: GRN 343]

IOM (Institute of Medicine). 2002/2005. Dietary Reference Intakes for energy, carbohydrates, fiber, fat, fatty acids, cholesterol, protein, and amino acids. National Academy Press, Washington, DC. 2002/2005.

Izydorczyk, M.S. and Biliaderis, C.G. 2007. Arabinoxylans: Technologically and Nutritionally Functional Plant Polysaccharides. *Functional Food Carbohydrates*. 1st edition:249-90.

Kale MS, Yadav MP, Chau HK, Hotchkiss Jr AR. 2018. Molecular and functional properties of a xylanase hydrolysate of corn bran arabinoxylan. *Carbohydr Polym*. 181:119-123.

Kaur A, Rose DJ, Rumpagaporn P, Patterson JA, Hamaker BR. 2011. In vitro batch fecal fermentation comparison of gas and short-chain fatty acid production using "slowly fermentable" dietary fibers. Journal of Food Science. 76(5):H137-H42. doi: 10.1111/j.1750-3841.2011.02172.x. [As cited in: Deehan *et al.,* 2021 (Unpublished report)]

King DE, Mainou AG, Lambourne CA. 2012. Trends in dietary fiber intake in the United States, 1999-2008. Journal of the Academy of Nutrition and Dietetics. 112:642-648.

Kjølbæk L, Benítez-Páez A, Gómez Del Pulgar EM, Brahe LK, Liebisch G, Matysik S, Rampelli S, Vermeiren J, Brigidi P, Larsen LH, Astrup A, Sanz Y. 2020. Arabinoxylan oligosaccharides and polyunsaturated fatty acid effects on gut microbiota and metabolic markers in overweight individuals with signs of metabolic syndrome: A randomized cross-over trial. Clinical Nutrition. 39(1):67-79. doi: 10.1016/j.clnu.2019.01.012.

Koecher KJ, Noack JA, Timm DA, Klosterbuer AS, Thomas W, Slavin JL. 2014. Estimation and interpretation of fermentation in the gut: coupling results from a 24 h batch in vitro system with fecal measurements from a human intervention feeding study using fructo-oligosaccharides, inulin, gum acacia, and pea fiber. Journal of Agricultural and Food Chemistry. 62(6):1332-37. doi: 10.1021/jf404688n. [As cited in: Deehan *et al.,* 2021 (Unpublished report)]

Livesey G. 2001. Tolerance of low-digestible carbohydrates: a general view. British Journal of Nutrition. 85(Suppl 1):S7-S16. [As cited in: Deehan *et al.*, 2021 (Unpublished report)]

Lu ZX, Walker KZ, Muir JG, Mascara T, O'Dea K. 2000. Arabinoxylan fiber, a byproduct of wheat flour processing, reduces the postprandial glucose response in normoglycemic subjects. American Journal of Clinical Nutrition. 71(5):1123–1128. doi: 10.1093/ajcn/71.5.1123. [As cited in: FDA, 2018]

Lu ZX, Walker KZ, Muir JG, O'Dea K. 2004. Arabinoxylan fibre improves metabolic control in people with Type II diabetes. European Journal of Clinical Nutrition. 58(4);621–628. doi: 10.1038/sj.ejcn.1601857. [As cited in: FDA, 2018]

Möhlig M, Koebnick1 C, Weickert MO. 2004. Arabinoxylan−enriched meal increases serum ghrelin levels in healthy humans. Hormone Metabolism Research 37(5):303-308. doi: 10.1055/s-2005-861474. [As cited in: FDA, 2018]

Napolitano A, Costabile A, Martin-Pelaez S, Vitaglione P, Klinder A, Gibson GR, Fogliano V. 2009. Potential prebiotic activity of oligosaccharides obtained by enzymatic conversion of durum wheat insoluble dietary fibre into soluble dietary fibre. Nutrition, Metabolism and Cardiovascular Diseases. 19(4):283-290. doi: 10.1016/j.numecd.2008.07.005. [As cited in: François *et al.*, 2010]

Nguyen NK, Deehan EC, Zhang Z, Jin M, Baskota N, Perez-Muñoz ME, Cole J, Tuncil YE, Seethaler B, Wang T, Laville M, Delzenne NM, Bischoff SC, Hamaker BR, Martínez I, Knights D, Bakal JA, Prado CM, Walter J. 2020. Gut microbiota modulation with long-chain corn bran arabinoxylan in adults with overweight and obesity is linked to an individualized temporal increase in fecal propionate. Microbiome. 8:118.

Oku T and Sadako N. 2002. Digestion, absorption, fermentation, and metabolism of functional sugar substitutes and their available energy. Pure and Applied Chemistry. 74(7):1253-1261. doi: 10.1351/pac200274071253.

Ooi SL, McMullen D, Golombick T, Nut D, Pak SC. 2018. Evidence-Based Review of BioBran/MGN-3 Arabinoxylan Compound as a Complementary Therapy for Conventional Cancer Treatment. Integrative Cancer Therapies. Jun;17(2):165-178. doi: 10.1177/1534735417735379.

Rose DJ, Patterson JA, Hamaker BR. 2010. Structural differences among alkali-soluble arabinoxylans from maize (*Zea mays*), rice (*Oryza sativa*), and wheat (*Triticum aestivum*) brans influence human fecal fermentation profiles. *J Agric Food Chem*. 58(1):493-99. [As cited in: Deehan *et al.*, 2021 (Unpublished report)]

Rumpagaporn P, Reuhs BL, Kaur A, Patterson JA, Keshavarzian A, Hamaker BR. 2015. Structural features of soluble cereal arabinoxylan fibers associated with a slow rate of *in vitro* fermentation by human fecal microbiota. Carbohydrate Polymers. 130:191-97. doi: 10.1016/j.carbpol.2015.04.041 [As cited in: Deehan *et al.,* 2021 (Unpublished report)]

Salama H, Medhat E, Shaheen M, Zekri AN, Darwish T, Ghoneum M. 2016. Arabinoxylan rice bran (Biobran) suppresses the viremia level in patients with chronic HCV infection: A randomized trial. International Journal of Immunopathology and Pharmacology. 29(4):647-653. doi: 10.1177/0394632016674954.

Saulnier L, Vigouroux J, Thibault JF. 1995a. Isolation and partial characterization of feruloylated oligosaccharides from maize bran. *Carbohydr Res*. 272(2):241-53. [As cited in: Deehan *et al.*, 2021 (Unpublished report)]

Saulnier L, Peneau N, Thibault JF. 1995b. Variability in grain extract viscosity and water-soluble arabinoxylan content in wheat. Journal of Cereal Science. 22:259-264. [As cited in: GRN 343]

Saulnier L, Marot C, Chanliaud E, Thibault JF. 1995c. Cell wall polysaccharide interactions in maize bran. *Carbohydr Polym*. 26(4):279-287.

Serra M, Weng V, Coelhoso IM, Alves VD, Brazinha C. 2020. Purification of Arabinoxylans from Corn Fiber and Preparation of Bioactive Films for Food Packaging. *Membranes*. 10(5):95.

Smiciklas-Wright H, Mitchell DC, Mickle SJ, Cook AJ, Goldman JD. 2002. Foods Commonly Eaten in the United States: Quantities Consumed Per Eating Occasion and in a Day, 1994-1996. U.S. Department of Agriculture NFS Report No. 96-5, pp 252.

Theander O, Aman P, Westerlund E, Andersson R, Pettersson D. 1995. Total dietary fiber determined as neutral sugar residues, uronic acid residues, and Klason lignin (the Uppsala method): collaborative study. *J AOAC Int*. 78(4):1030-1044.

Walton GE, Lu C, Trogh I, Arnaut F, Gibson GR. 2012. A randomised, double-blind, placebo controlled cross-over study to determine the gastrointestinal effects of consumption of arabinoxylan-oligosaccharides enriched bread in healthy volunteers. Nutrition Journal. 11:36. doi: 10.1186/1475-2891-11-36.

Xiao L, Ning J, Xu G. 2012. Application of Xylo-oligosaccharide in modifying human intestinal function. African Journal of Microbiology Research. 6:2116–2119. doi: 10.5897/AJMR11.1415. [As cited in: EFSA, 2018]

Yang J, Summanen PH, Henning SM, Hsu M, Lam H, Huang J, Tseng CH, Dowd SE, Finegold SM, Heber D, Li Z. 2015. Xylooligosaccharide supplementation alters gut bacteria in both healthy and prediabetic adults: a pilot study. Frontiers in Physiology. 2015 6:216. doi: 10.3389/fphys.2015.00216. [As cited in: EFSA, 2018]

EXHIBIT I.

Technical Documentation for Corn Bran Arabinoxylan (BFG)

Exhibit I-A: BFG Specifications
Exhibit 1-B: Certificates of Analysis

Soluble Corn Fiber (BFG)

Product Specifications Sheet

Country of Manufacture: USA, Manufactured from refined, dry milled corn bran

Chemical Identity: Corn Bran Arabinoxylan

Ingredient Statement: Corn bran fiber, soluble corn fiber, corn bran extract

Certification: Kosher and Halal

Organoleptic Data: Tan powder, odorless, slightly sweet.

Chemical Composition	**Specification Range**
Moisture, %	9.00 max
Ash, %	< 6.00
Total Dietary Fiber, %	74 to 90

Microbiological Data	
Aerobic Plate Count, (TPC)	<6000 cfu/g
Yeast, (PDA Count)	< 10 cfu/g
Mold, (PDA Count)	< 10 cfu/g
E. coli (MPN)	< 10 cfu/g
Coliform (MPN)	< 10 cfu/g
Salmonella (FDA, BAM)	Negative/25g

Package Size: 10 kg (22 lbs.); 23 x 12 ½ x 14 ¾" Polyline boxes (L x W X H)

Shelf Life: Two years if stored properly in a cool dry place in a sealed container

AgriFiber Solutions LLC
1011 Campus Drive,
Mundelein, IL 60060,
(847) 549-6002.

CERTIFICATE OF ANALYSIS

Country of Manufacture: **USA**

Lot No: **BFG** **948179 1**

Ingredient Statement: **Soluble Corn Fiber**

Organoleptic Data: light brown powder, sligtly sweet

Physical Data:

Color Value	L = 49.60	a =	6.14	b =	18.77
Viscosity	573 cps	Temp. at	25.1 °C , 10% solids		
		Shear-thinning thixotropic gel			
Moisture:	4.41 %				

Microbiological Data:

Test	Method	Result	Units
APC	FDA BAM	4800	cfu/g
Yeast	FDA BAM	<10	cfu/g
Mold	FDA BAM	<10	cfu/g
E. Coli	Petri film	<10	cfu/g
Coliform	Petri film	<10	cfu/g
Salmonella	FDA BAM	Negative	/ 25g

Shelf Life: Two years if stored under cool dry conditions in a sealed container

Date of Manufacturing: May 18, 2020

Expiration Date: May 17, 2022

Date of Certification: June 25, 2020

AgriFiber Solutions LLC
1011 Campus Drive,
Mundelein, IL 60060,
(847) 549-6002.

CERTIFICATE OF ANALYSIS

Country of Manufacture: **USA**

Lot No: **BFG** **948779 1**

Ingredient Statement: **Soluble Corn Fiber**

Organoleptic Data: light brown powder, sligtly sweet

Physical Data:

Color Value	L = 52.43	a = 6.42	b = 20.20		
Viscosity	600 cps	Temp. at 25.1 °C , 10% solids Shear-thinning thixotropic gel			
Moisture:	4.81 %				

Microbiological Data:

Test	Method	Result	Units
APC	FDA BAM	1200	cfu/g
Yeast	FDA BAM	<10	cfu/g
Mold	FDA BAM	<10	cfu/g
E. Coli	Petri film	<10	cfu/g
Coliform	Petri film	<10	cfu/g
Salmonella	FDA BAM	Negative	/ 25g

Shelf Life: Two years if stored under cool dry conditions in a sealed container

Date of Manufacturing: May 12, 2020

Expiration Date: May 11, 2022

Date of Certification: June 25, 2020

AgriFiber Solutions LLC
1011 Campus Drive,
Mundelein, IL 60060,
(847) 549-6002.

CERTIFICATE OF ANALYSIS

Country of Manufacture: **USA**

Lot No: **BFG** **948879 1**

Ingredient Statement: **Soluble Corn Fiber**

Organoleptic Data: light brown powder, sligtly sweet

Physical Data:

Color Value	L = 48.18	a = 6.13	b = 19.22	
Viscosity	533 cps	Temp. at 25.1 °C , 10% solids Shear-thinning thixotropic gel		
Moisture:	8.60 %			

Microbiological Data:

Test	Method	Result	Units
APC	FDA BAM	5100	cfu/g
Yeast	FDA BAM	<10	cfu/g
Mold	FDA BAM	<10	cfu/g
E. Coli	Petri film	<10	cfu/g
Coliform	Petri film	<10	cfu/g
Salmonella	FDA BAM	Negative	/ 25g

Shelf Life: Two years if stored under cool dry conditions in a sealed container

Date of Manufacturing: May 11, 2020

Expiration Date: May 10, 2022

Date of Certification: June 25, 2020

Eurofins Scientific Inc. (Des Moines)

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AgriFiber Solutions LLC

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Mundelein, IL 60060

ANALYTICAL REPORT

AR-20-QD-200481-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260204	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948179-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD275 - Serving Size (Customer Supplied) | **Reference:** No Reference | **Completed:** 28Oct2020

Parameter	Result	Per Serving	Theoretical
Unit weight	100.0000 g	100.0000 g	
Units per serving	1	1	1
Serving Size	100.00 g	100.00 g	100 g/Serving

QD252 - Protein - Combustion | **Reference:** AOAC 990.03; AOAC 992.15 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 29Oct2020

Parameter	Result	Per Serving	Theoretical
Protein	5.75 %	5.75 g/Serving	
Nitrogen - Combustion	0.92 %	0.92 g/Serving	
Protein Factor	6.25	6.25	

QD250 - Ash | **Reference:** AOAC 942.05 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 29Oct2020

Parameter	Result	Per Serving	Theoretical
Ash	5.29 %	5.29 g/Serving	

QD226 - Calories, Calculated | **Reference:** CFR - Atwater calculation | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Nov2020

Parameter	Result	Per Serving	Theoretical
Calories Calculated	201 kcal/100 g	201 kcal/Serving	

QD038 - Carbohydrates, Calculated | **Reference:** CFR 21-calc. | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Nov2020

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-200481-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260204	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948179-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD038 - Carbohydrates, Calculated

Reference	Accreditation	Completed
CFR 21-calc.	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Carbohydrates, Calculated	81.96 %	81.96 g/Serving	

QD153 - Moisture by Karl Fischer

Reference	Accreditation	Completed
AOCS Ca 2e-84	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Moisture, Karl Fischer	5.84 %	5.84 g/Serving	

QD251 - Calcium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Calcium	0.189 %	0.189 g/Serving	

QD107 - Iron by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Iron	0.0168 %	0.0168 g/Serving	

QD179 - Potassium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Potassium	0.064 %	0.064 g/Serving	

QD198 - Sodium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	05Nov2020

Parameter	Result	Per Serving	Theoretical
Sodium	1.98 %	1.98 g/Serving	

QD01T - Total dietary fiber HPLC (Includes LMWSDF)

Reference	Completed
AOAC 2009.01 & AOAC 2011.25	04Nov2020

Parameter	Result	Per Serving	Theoretical
Low molecular wgt soluble dietary fiber(LMWSDF)	0.34 %	0.34 g/Serving	

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ANALYTICAL REPORT

AR-20-QD-200481-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260204	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948179-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD01T - Total dietary fiber HPLC (Includes LMWSDF)
Reference: AOAC 2009.01 & AOAC 2011.25
Completed: 04Nov2020

Parameter	Result	Per Serving	Theoretical
High molecular wgt soluble dietary fiber (HMWSDF)	76.54 %	76.54 g/Serving	
Insoluble dietary fiber (IDF)	1.65 %	1.65 g/Serving	
Soluble Dietary Fiber (LMWSDF + HMWSDF)	76.88 %	76.88 g/Serving	
Total dietary fiber (IDF + HMWSDF + LMWSDF)	78.53 %	78.53 g/Serving	

QQ129 - Sugar Profile (AOAC, Most Matrices)
Reference: AOAC 982.14, mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 04Nov2020

Parameter	Result	Per Serving	Theoretical
Fructose	<0.15 %	<0.15 g/Serving	
Glucose	<0.15 %	<0.15 g/Serving	
Sucrose	<0.15 %	<0.15 g/Serving	
Maltose	<0.15 %	<0.15 g/Serving	
Lactose	<0.15 %	<0.15 g/Serving	
Total sugars	<0.35 %	<0.35 g/Serving	

QD0EK - Vitamin D (LC-MS/MS)
Reference: Huang et al., Rapid Commun. Mass Spectrum 2014, 28
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 31Oct2020

Parameter	Result	Per Serving	Theoretical
Total Vitamin D2 and D3	<4 IU/100 g	<4.00 IU/Serving	
Vitamin D2	<4 IU/100 g	<4.00 IU/Serving	
Vitamin D3	<4 IU/100 g	<4.00 IU/Serving	

QD041 - Cholesterol in Food
Reference: AOAC 994.10 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
Cholesterol	<0.8 mg/100 g	<0.8 mg/Serving	

QD036 - Calories From Total Fat, Calc
Reference: CFR 21-calc.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
Calories From Total Fat, Calc.	10 kcal/100 g	10 kcal/Serving	

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ANALYTICAL REPORT

AR-20-QD-200481-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260204	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948179-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QQ051 - Fatty Acid Composition-Sat,Trans,Poly,Mono,&Total
Reference: AOAC 996.06 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
cis, cis-Polyunsaturated Fatty Acids	0.17 %	0.17 g/Serving	
cis-Monounsaturated Fatty Acids	0.38 %	0.38 g/Serving	
Total Saturated Fatty Acids	0.52 %	0.52 g/Serving	
Total Fat as Triglycerides	1.16 %	1.16 g/Serving	
Total Trans Fatty Acid Isomers - GC	0.04 %	0.04 g/Serving	

QAA07 - Vomitoxin (Deoxynivalenol, DON) LC-MSMS
Reference: Food Addit Contam Part A, 2013:30(3),541-9.
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Vomitoxin (Deoxynivalenol)	<10 µg/kg	<10 µg/kg	

QAA19 - Zearalenone (LC-MSMS)
Reference: Food Addit Contam Part A, 2013:30(3),541-9.
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Zearalenone	<5.0 µg/kg	<5.0 µg/kg	

QA01P - Pesticides Quechers GC-MSMS
Reference: AOAC 2007.01
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Screened pesticides	Not Detected	Not detected	

QA01R - Pesticides Quechers-LC-MS/MS
Reference: AOAC 2007.01
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Screened pesticides	Not Detected	Not detected	

QD03M - Nutrition Facts Panel
Reference: Genesis
Completed: 26Oct2020

Parameter	Result	Per Serving	Theoretical
Nutrition Label Format Report	requested	requested	

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ANALYTICAL REPORT

AR-20-QD-200481-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides

Received On: 26Oct2020
Reported On: 09Nov2020

Subcontracting partners:
1 - Eurofins Central Analytical Laboratories, LA

Respectfully Submitted,

Brian Schuld
Analytical Services Manager

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ANALYTICAL REPORT

AR-20-QD-200482-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260205	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948779-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD275 - Serving Size (Customer Supplied) | **Reference:** No Reference | **Completed:** 28Oct2020

Parameter	Result	Per Serving	Theoretical
Unit weight	100.0000 g	100.0000 g	g
Units per serving	1	1	1
Serving Size	100.00 g	100.00 g	100 g/Serving

QD252 - Protein - Combustion | **Reference:** AOAC 990.03; AOAC 992.15 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 29Oct2020

Parameter	Result	Per Serving	Theoretical
Protein	5.56 %	5.56 g/Serving	
Nitrogen - Combustion	0.89 %	0.89 g/Serving	
Protein Factor	6.25	6.25	

QD250 - Ash | **Reference:** AOAC 942.05 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 29Oct2020

Parameter	Result	Per Serving	Theoretical
Ash	4.58 %	4.58 g/Serving	

QD226 - Calories, Calculated | **Reference:** CFR - Atwater calculation | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Nov2020

Parameter	Result	Per Serving	Theoretical
Calories Calculated	207 kcal/100 g	207 kcal/Serving	

QD038 - Carbohydrates, Calculated | **Reference:** CFR 21-calc. | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Nov2020

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ANALYTICAL REPORT

AR-20-QD-200482-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260205	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948779-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD038 - Carbohydrates, Calculated

Reference	Accreditation	Completed
CFR 21-calc.	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Carbohydrates, Calculated	84.97 %	84.97 g/Serving	

QD153 - Moisture by Karl Fischer

Reference	Accreditation	Completed
AOCS Ca 2e-84	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Moisture, Karl Fischer	3.67 %	3.67 g/Serving	

QD251 - Calcium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	02Nov2020

Parameter	Result	Per Serving	Theoretical
Calcium	0.209 %	0.209 g/Serving	

QD107 - Iron by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	02Nov2020

Parameter	Result	Per Serving	Theoretical
Iron	0.0023 %	0.0023 g/Serving	

QD179 - Potassium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	02Nov2020

Parameter	Result	Per Serving	Theoretical
Potassium	0.063 %	0.063 g/Serving	

QD198 - Sodium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	03Nov2020

Parameter	Result	Per Serving	Theoretical
Sodium	1.63 %	1.63 g/Serving	

QD01T - Total dietary fiber HPLC (Includes LMWSDF)

Reference	Completed
AOAC 2009.01 & AOAC 2011.25	04Nov2020

Parameter	Result	Per Serving	Theoretical
Low molecular wgt soluble dietary fiber(LMWSDF)	0.35 %	0.35 g/Serving	

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ANALYTICAL REPORT

AR-20-QD-200482-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260205	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948779-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD01T - Total dietary fiber HPLC (Includes LMWSDF)
Reference: AOAC 2009.01 & AOAC 2011.25
Completed: 04Nov2020

Parameter	Result	Per Serving	Theoretical
High molecular wgt soluble dietary fiber (HMWSDF)	79.92 %	79.92 g/Serving	
Insoluble dietary fiber (IDF)	1.34 %	1.34 g/Serving	
Soluble Dietary Fiber (LMWSDF + HMWSDF)	80.27 %	80.27 g/Serving	
Total dietary fiber (IDF + HMWSDF + LMWSDF)	81.61 %	81.61 g/Serving	

QQ129 - Sugar Profile (AOAC, Most Matrices)
Reference: AOAC 982.14, mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 04Nov2020

Parameter	Result	Per Serving	Theoretical
Fructose	<0.15 %	<0.15 g/Serving	
Glucose	<0.15 %	<0.15 g/Serving	
Sucrose	<0.15 %	<0.15 g/Serving	
Maltose	<0.15 %	<0.15 g/Serving	
Lactose	<0.15 %	<0.15 g/Serving	
Total sugars	<0.35 %	<0.35 g/Serving	

QD0EK - Vitamin D (LC-MS/MS)
Reference: Huang et al., Rapid Commun. Mass Spectrum 2014, 28
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 31Oct2020

Parameter	Result	Per Serving	Theoretical
Total Vitamin D2 and D3	<4 IU/100 g	<4.00 IU/Serving	
Vitamin D2	<4 IU/100 g	<4.00 IU/Serving	
Vitamin D3	<4 IU/100 g	<4.00 IU/Serving	

QD041 - Cholesterol in Food
Reference: AOAC 994.10 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
Cholesterol	<0.8 mg/100 g	<0.8 mg/Serving	

QD036 - Calories From Total Fat, Calc
Reference: CFR 21-calc.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
Calories From Total Fat, Calc.	11 kcal/100 g	11 kcal/Serving	

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ANALYTICAL REPORT

AR-20-QD-200482-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260205	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948779-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QQ051 - Fatty Acid Composition-Sat,Trans,Poly,Mono,&Total
Reference: AOAC 996.06 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
cis, cis-Polyunsaturated Fatty Acids	0.19 %	0.19 g/Serving	
cis-Monounsaturated Fatty Acids	0.42 %	0.42 g/Serving	
Total Saturated Fatty Acids	0.53 %	0.53 g/Serving	
Total Fat as Triglycerides	1.22 %	1.22 g/Serving	
Total Trans Fatty Acid Isomers - GC	0.03 %	0.03 g/Serving	

QAA07 - Vomitoxin (Deoxynivalenol, DON) LC-MSMS
Reference: Food Addit Contam Part A, 2013:30(3),541-9.
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Vomitoxin (Deoxynivalenol)	<10 µg/kg	<10 µg/kg	

QAA19 - Zearalenone (LC-MSMS)
Reference: Food Addit Contam Part A, 2013:30(3),541-9.
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Zearalenone	<5.0 µg/kg	<5.0 µg/kg	

QA01P - Pesticides Quechers GC-MSMS
Reference: AOAC 2007.01
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Screened pesticides	Not Detected	Not detected	

QA01R - Pesticides Quechers-LC-MS/MS
Reference: AOAC 2007.01
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Screened pesticides	Not Detected	Not detected	

QD03M - Nutrition Facts Panel
Reference: Genesis
Completed: 26Oct2020

Parameter	Result	Per Serving	Theoretical
Nutrition Label Format Report	requested	requested	

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ANALYTICAL REPORT

AR-20-QD-200482-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Subcontracting partners:
1 - Eurofins Central Analytical Laboratories, LA

Respectfully Submitted,

ACCREDITED

Brian Schuld
Analytical Services Manager

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ANALYTICAL REPORT

AR-20-QD-200483-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260206	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948879-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD275 - Serving Size (Customer Supplied) | **Reference:** No Reference | **Completed:** 28Oct2020

Parameter	Result	Per Serving	Theoretical
Unit weight	100.0000 g	100.0000 g	
Units per serving	1	1	1
Serving Size	100.00 g	100.00 g	100 g/Serving

QD252 - Protein - Combustion | **Reference:** AOAC 990.03; AOAC 992.15 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 29Oct2020

Parameter	Result	Per Serving	Theoretical
Protein	5.19 %	5.19 g/Serving	
Nitrogen - Combustion	0.83 %	0.83 g/Serving	
Protein Factor	6.25	6.25	

QD250 - Ash | **Reference:** AOAC 942.05 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 29Oct2020

Parameter	Result	Per Serving	Theoretical
Ash	4.71 %	4.71 g/Serving	

QD226 - Calories, Calculated | **Reference:** CFR - Atwater calculation | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Nov2020

Parameter	Result	Per Serving	Theoretical
Calories Calculated	206 kcal/100 g	206 kcal/Serving	

QD038 - Carbohydrates, Calculated | **Reference:** CFR 21-calc. | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Nov2020

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-200483-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260206	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948879-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD038 - Carbohydrates, Calculated

Reference	Accreditation	Completed
CFR 21-calc.	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Carbohydrates, Calculated	84.28 %	84.28 g/Serving	

QD153 - Moisture by Karl Fischer

Reference	Accreditation	Completed
AOCS Ca 2e-84	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Moisture, Karl Fischer	4.84 %	4.84 g/Serving	

QD251 - Calcium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Calcium	0.212 %	0.212 g/Serving	

QD107 - Iron by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Iron	0.0034 %	0.0034 g/Serving	

QD179 - Potassium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	04Nov2020

Parameter	Result	Per Serving	Theoretical
Potassium	0.053 %	0.053 g/Serving	

QD198 - Sodium by ICP

Reference	Accreditation	Completed
AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod	ISO/IEC 17025:2017 A2LA 2927.01	05Nov2020

Parameter	Result	Per Serving	Theoretical
Sodium	1.68 %	1.68 g/Serving	

QD01T - Total dietary fiber HPLC (Includes LMWSDF)

Reference	Completed
AOAC 2009.01 & AOAC 2011.25	07Nov2020

Parameter	Result	Per Serving	Theoretical
Low molecular wgt soluble dietary fiber(LMWSDF)	0.30 %	0.30 g/Serving	

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ANALYTICAL REPORT

AR-20-QD-200483-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260206	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948879-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QD01T - Total dietary fiber HPLC (Includes LMWSDF)
Reference: AOAC 2009.01 & AOAC 2011.25
Completed: 07Nov2020

Parameter	Result	Per Serving	Theoretical
High molecular wgt soluble dietary fiber (HMWSDF)	78.56 %	78.56 g/Serving	
Insoluble dietary fiber (IDF)	0.70 %	0.70 g/Serving	
Soluble Dietary Fiber (LMWSDF + HMWSDF)	78.86 %	78.86 g/Serving	
Total dietary fiber (IDF + HMWSDF + LMWSDF)	79.56 %	79.56 g/Serving	

QQ129 - Sugar Profile (AOAC, Most Matrices)
Reference: AOAC 982.14, mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 04Nov2020

Parameter	Result	Per Serving	Theoretical
Fructose	<0.15 %	<0.15 g/Serving	
Glucose	<0.15 %	<0.15 g/Serving	
Sucrose	<0.15 %	<0.15 g/Serving	
Maltose	<0.15 %	<0.15 g/Serving	
Lactose	<0.15 %	<0.15 g/Serving	
Total sugars	<0.35 %	<0.35 g/Serving	

QD0EK - Vitamin D (LC-MS/MS)
Reference: Huang et al., Rapid Commun. Mass Spectrum 2014, 28
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 31Oct2020

Parameter	Result	Per Serving	Theoretical
Total Vitamin D2 and D3	<4 IU/100 g	<4.00 IU/Serving	
Vitamin D2	<4 IU/100 g	<4.00 IU/Serving	
Vitamin D3	<4 IU/100 g	<4.00 IU/Serving	

QD041 - Cholesterol in Food
Reference: AOAC 994.10 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
Cholesterol	<0.8 mg/100 g	<0.8 mg/Serving	

QD036 - Calories From Total Fat, Calc
Reference: CFR 21-calc.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
Calories From Total Fat, Calc.	9 kcal/100 g	9 kcal/Serving	

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-200483-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides
Received On: 26Oct2020
Reported On: 09Nov2020

Eurofins Sample Code:	464-2020-10260206	**Sample Registration Date:**	26Oct2020
Client Sample Code:	BFG948879-01	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	Soluble Corn Fiber ss=100g	**Sample Reference:**	BFG

QQ051 - Fatty Acid Composition-Sat,Trans,Poly,Mono,&Total
Reference: AOAC 996.06 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 30Oct2020

Parameter	Result	Per Serving	Theoretical
cis, cis-Polyunsaturated Fatty Acids	0.09 %	0.09 g/Serving	
cis-Monounsaturated Fatty Acids	0.33 %	0.33 g/Serving	
Total Saturated Fatty Acids	0.48 %	0.48 g/Serving	
Total Fat as Triglycerides	0.98 %	0.98 g/Serving	
Total Trans Fatty Acid Isomers - GC	0.04 %	0.04 g/Serving	

QAA07 - Vomitoxin (Deoxynivalenol, DON) LC-MSMS
Reference: Food Addit Contam Part A, 2013:30(3),541-9.
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Vomitoxin (Deoxynivalenol)	<10 µg/kg	<10 µg/kg	

QAA19 - Zearalenone (LC-MSMS)
Reference: Food Addit Contam Part A, 2013:30(3),541-9.
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Zearalenone	<5.0 µg/kg	<5.0 µg/kg	

QA01P - Pesticides Quechers GC-MSMS
Reference: AOAC 2007.01
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Screened pesticides	Not Detected	Not detected	

QA01R - Pesticides Quechers-LC-MS/MS
Reference: AOAC 2007.01
Accreditation: ISO/IEC 17025:2017 A2LA 2993.01
Completed: 09Nov2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
Screened pesticides	Not Detected	Not detected	

QD03M - Nutrition Facts Panel
Reference: Genesis
Completed: 26Oct2020

Parameter	Result	Per Serving	Theoretical
Nutrition Label Format Report	requested	requested	

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-200483-01

Client Code: QD0009451
Number: (3) BFG lots, nutitionals, pesticides

Received On: 26Oct2020
Reported On: 09Nov2020

Subcontracting partners:
1 - Eurofins Central Analytical Laboratories, LA

Respectfully Submitted,

Brian Schuld
Analytical Services Manager

Results shown in this report relate solely to the item submitted for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of Eurofins Scientific, Inc. | All work done in accordance with Eurofins General Terms and Conditions of Sale: www.eurofinsus.com/terms_and_conditions.pdf | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at Eurofins. Measurement of uncertainty can be obtained upon request.

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Name: AgriFiber Solutions LLC
Customer: Adam Blackshaw
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Order ID: LI-200528-113
Report ID: LI-200528-113.000007
Date Received: 5/28/2020 13:18:22
Reported: 6/25/2020 13:25:32
P.O. #: CP

Report of Results

Deibel Lab #: LI-200528-113-002 **Analysis Date:** 2020/05/28 **Receiving Temperature:** 20C **Sample Condition:** Okay
Description: GRAS#2 CBFG2-948879-01

Test:	Result:	Units:	Method:	Reference:	Comment:
APC	5100	cfu/g	FDA BAM	AOAC 966.23	
Coliform Petrifilm	<10	cfu/g	Petrifilm	AOAC 991.14	
Yeast	<10	cfu/g	FDA BAM	FDA BAM: 7ed. 1992	
Mold	<10	cfu/g	FDA BAM	FDA BAM: 7ed. 1992	

Sample group reactivated for additional test. LI-200528-113-000005 Revised DV 6/25/20 -.000006 Revised DV6/25

Login By: GE **Entered By:** WELDRIDGE **Approved By:** DVI

The above test results only represents that portion of the product lot that has been sampled by the client and sent to Deibel Laboratories. This report conforms to 21 CFR Part 11 compliancy for electronic signatures. The final approval of this Formal Report is authorized by the individual labeled as 'Approved By'. Test results relate only to the analytical unit tested. This report cannot be reproduced except in full, and by the written consent of Deibel Labs. All information contained herein is Trade Secret and Confidential. See our updated terms and condition at www.deibellabs.com/termsandconditions

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847-549-6002 x1080

Order ID: LI-200528-113
Report ID: LI-200528-113.000007
Date Received: 5/28/2020 13:18:22
Reported: 6/25/2020 13:25:32
P.O. #: CP

Report of Results

Deibel Lab #: LI-200528-113-002 **Analysis Date:** 2020/05/28 **Receiving Temperature:** 20C **Sample Condition:** Okay
Description: GRAS#2 CBFG2-948879-01

Test:	Result:	Units:	Method:	Reference:	Comment:
Salmonella FDA/BAM	Negative	/25g	FDA-BAM	8th ed., Ch 5	
C.perfringens	<10	cfu/g	FDA BAM	8 ed. Ch 16	
Aflatoxin ELISA	<5.0	ppb	Neogen Veratox	AOAC RI-05091	
Protein (Factor 6.25)	5.22	%	Kjeldahl	AOAC 991.20	
Ash	4.67	%	Gravimetric	Mod 923.03/942.05	
Lead ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Arsenic ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Cadmium ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Mercury ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Tests sent to outsource labs	Total fiber		Outside Lab Information	Available Upon Request	
Total Dietary Fiber	84.10	%	Enzymatic HPLC	AOAC 2009.01	
Fat - Acid Hydrolysis*	2.55	%	Gravimetric	AOAC 922.06	

Deibel Lab #: LI-200528-113-003 **Analysis Date:** 2020/05/28 **Receiving Temperature:** 20C **Sample Condition:** Okay
Description: GRAS#3 CBFG2-948779-01

Test:	Result:	Units:	Method:	Reference:	Comment:
APC	1200	cfu/g	FDA BAM	AOAC 966.23	
Coliform Petrifilm	<10	cfu/g	Petrifilm	AOAC 991.14	
Yeast	<10	cfu/g	FDA BAM	FDA BAM: 7ed. 1992	
Mold	<10	cfu/g	FDA BAM	FDA BAM: 7ed. 1992	
Salmonella FDA/BAM	Negative	/25g	FDA-BAM	8th ed., Ch 5	
C.perfringens	<10	cfu/g	FDA BAM	8 ed. Ch 16	
Aflatoxin ELISA	<5.0	ppb	Neogen Veratox	AOAC RI-05091	
Protein (Factor 6.25)	5.69	%	Kjeldahl	AOAC 991.20	

Sample group reactivated for additional test. LI-200528-113-000005 Revised DV 6/25/20 -.000006 Revised DV6/25

Login By: GE **Entered By:** WELDRIDGE **Approved By:** DVI

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Name: AgriFiber Solutions LLC
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Order ID: LI-200528-113
Report ID: LI-200528-113.000007
Date Received: 5/28/2020 13:18:22
Reported: 6/25/2020 13:25:32
P.O. #: CP

Report of Results

Deibel Lab #: LI-200528-113-003 **Analysis Date:** 2020/05/28 **Receiving Temperature:** 20C **Sample Condition:** Okay
Description: GRAS#3 CBFG2-948779-01

Test:	Result:	Units:	Method:	Reference:	Comment:
Ash	4.55	%	Gravimetric	Mod 923.03/942.05	
Lead ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Arsenic ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Cadmium ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Mercury ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Tests sent to outsource labs	Total fiber		Outside Lab Information	Available Upon Request	
Total Dietary Fiber	84.40	%	Enzymatic HPLC	AOAC 2009.01	
Fat - Acid Hydrolysis*	2.59	%	Gravimetric	AOAC 922.06	

Deibel Lab #: LI-200528-113-004 **Analysis Date:** 2020/05/28 **Receiving Temperature:** 20C **Sample Condition:** Okay
Description: GRAS#4 CBFG2-948179-01

Test:	Result:	Units:	Method:	Reference:	Comment:
APC	4800	cfu/g	FDA BAM	AOAC 966.23	
Coliform Petrifilm	<10	cfu/g	Petrifilm	AOAC 991.14	
Yeast	<10	cfu/g	FDA BAM	FDA BAM: 7ed. 1992	
Mold	<10	cfu/g	FDA BAM	FDA BAM: 7ed. 1992	
Salmonella FDA/BAM	Negative	/25g	FDA-BAM	8th ed., Ch 5	
C.perfringens	<10	cfu/g	FDA BAM	8 ed. Ch 16	
Aflatoxin ELISA	<5.0	ppb	Neogen Veratox	AOAC RI-05091	
Protein (Factor 6.25)	5.65	%	Kjeldahl	AOAC 991.20	
Ash	5.12	%	Gravimetric	Mod 923.03/942.05	
Lead ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Arsenic ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Cadmium ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	

Sample group reactivated for additional test. LI-200528-113-000005 Revised DV 6/25/20 -.000006 Revised DV6/25

Login By: GE **Entered By:** WELDRIDGE **Approved By:** DVI

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Order ID: LI-200528-113
Report ID: LI-200528-113.000007
Date Received: 5/28/2020 13:18:22
Reported: 6/25/2020 13:25:32
P.O. #: CP

Report of Results

Deibel Lab #: LI-200528-113-004 **Analysis Date:** 2020/05/28 **Receiving Temperature:** 20C **Sample Condition:** Okay

Description: GRAS#4 CBFG2-948179-01

Test:	Result:	Units:	Method:	Reference:	Comment:
Mercury ICP (ppm)	<0.10	ppm	ICP-OES	AOAC 985.01 modified	
Tests sent to outsource labs	Total fiber		Outside Lab Information	Available Upon Request	
Total Dietary Fiber	83.40	%	Enzymatic HPLC	AOAC 2009.01	
Fat - Acid Hydrolysis*	2.60	%	Gravimetric	AOAC 922.06	

Sample group reactivated for additional test. LI-200528-113-000005 Revised DV 6/25/20 -.000006 Revised DV6/25

Login By: GE **Entered By:** WELDRIDGE **Approved By:** DVI

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QD275 - Serving Size (Customer Supplied) | **Reference:** No Reference | **Completed:** 30Jul2020

Parameter	Result	Per Serving	Theoretical
Unit weight	100.0000 g	100.0000 g	g
Units per serving	1	1	1
Serving Size	100.00 g	100.00 g	100 g/Serving

QD252 - Protein - Combustion | **Reference:** AOAC 990.03; AOAC 992.15 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Aug2020

Parameter	Result	Per Serving	Theoretical
Protein	4.63 %	4.63 g/Serving	
Nitrogen - Combustion	0.86 %	0.86 g/Serving	%
Protein Factor	5.38	5.38	

QD250 - Ash | **Reference:** AOAC 942.05 | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 30Jul2020

Parameter	Result	Per Serving	Theoretical
Ash	4.91 %	4.91 g/Serving	

QD226 - Calories, Calculated | **Reference:** CFR - Atwater calculation | **Accreditation:** ISO/IEC 17025:2017 A2LA 2927.01 | **Completed:** 04Aug2020

Parameter	Result	Per Serving	Theoretical
Calories Calculated	205 kcal/100 g	205 kcal/Serving	
Corrected Result			

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QD038 - Carbohydrates, Calculated
Reference: CFR 21-calc.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 04Aug2020

Parameter	Result	Per Serving	Theoretical
Carbohydrates, Calculated	84.60 %	84.60 g/Serving	

QD148 - Moisture by Vacuum Oven
Reference: AOAC 925.09
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 03Aug2020

Parameter	Result	Per Serving	Theoretical
Moisture and Volatiles - Vacuum Oven	4.8 %	4.8 g/Serving	

QD251 - Calcium by ICP
Reference: AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical
Calcium	196 mg/100 g	196 mg/Serving	

QD107 - Iron by ICP
Reference: AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical
Iron	2.7 mg/100 g	2.7 mg/Serving	

QD179 - Potassium by ICP
Reference: AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical
Potassium	59 mg/100 g	59 mg/Serving	

QD198 - Sodium by ICP
Reference: AOAC 984.27 mod,927.02 mod,985.01 mod,965.17 mod
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical
Sodium	1,700 mg/100 g	1,700 mg/Serving	

QD01T - Total dietary fiber HPLC (Includes LMWSDF)
Reference: AOAC 2009.01 & AOAC 2011.25
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QD01T - Total dietary fiber HPLC (Includes LMWSDF)
Reference: AOAC 2009.01 & AOAC 2011.25
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical
Low molecular wgt soluble dietary fiber(LMWSDF)	0.36 %	0.36 g/Serving	
High molecular wgt soluble dietary fiber (HMWSDF)	78.97 %	78.97 g/Serving	
Insoluble dietary fiber (IDF)	0.80 %	0.80 g/Serving	
Soluble Dietary Fiber (LMWSDF + HMWSDF)	79.33 %	79.33 g/Serving	
Total dietary fiber (IDF + HMWSDF + LMWSDF)	80.13 %	80.13 g/Serving	

QQ129 - Sugar Profile (AOAC, Most Matrices)
Reference: AOAC 982.14, mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 05Aug2020

Parameter	Result	Per Serving	Theoretical
Fructose	<0.15 g/100 g	<0.15 g/Serving	
Glucose	<0.15 g/100 g	<0.15 g/Serving	
Sucrose	<0.15 g/100 g	<0.15 g/Serving	
Maltose	<0.15 g/100 g	<0.15 g/Serving	
Lactose	<0.15 g/100 g	<0.15 g/Serving	
Total sugars	<0.35 g/100 g	<0.35 g/Serving	

QD0EK - Vitamin D (LC-MS/MS)
Reference: Huang et al., Rapid Commun. Mass Spectrum 2014, 28
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 06Aug2020

Parameter	Result	Per Serving	Theoretical
Total Vitamin D2 and D3	<0.10000 µg/100 g	<0.1000 µg/Serving	
Vitamin D2	<0.10000 µg/100 g	<0.1000 µg/Serving	
Vitamin D3	<0.10000 µg/100 g	<0.1000 µg/Serving	

QD041 - Cholesterol in Food
Reference: AOAC 994.10 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 04Aug2020

Parameter	Result	Per Serving	Theoretical
Cholesterol	<0.8 mg/100 g	<0.8 mg/Serving	

AgriFiber Solutions LLC

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2
Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QD036 - Calories From Total Fat, Calc
Reference: CFR 21-calc.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 31Jul2020

Parameter	Result	Per Serving	Theoretical
Calories From Total Fat, Calc.	10 kcal/100 g	10 kcal/Serving	

QQ051 - Fatty Acid Composition-Sat,Trans,Poly,Mono,&Total
Reference: AOAC 996.06 mod.
Accreditation: ISO/IEC 17025:2017 A2LA 2927.01
Completed: 31Jul2020

Parameter	Result	Per Serving	Theoretical
cis, cis-Polyunsaturated Fatty Acids	0.22 %	0.22 g/Serving	
cis-Monounsaturated Fatty Acids	0.35 %	0.35 g/Serving	
Total Saturated Fatty Acids	0.42 %	0.42 g/Serving	
Total Fat as Triglycerides	1.06 %	1.06 g/Serving	
Total Trans Fatty Acid Isomers - GC	0.03 %	0.03 g/Serving	

QA01P - Pesticides Quechers GC-MSMS
Reference: AOAC 2007.01
Accreditation: A2LA ISO/IEC 17025:2005 2993-01
Completed: 06Aug2020
Sub: 1

Parameter	Result	Per Serving	Theoretical
2,3,5,6-Tetrachloroaniline	<0.01 mg/kg	<0.01 mg/kg	
Acephate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Acetochlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Aclonifen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Acrinathrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Aldrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Allethrin	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Ametryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Atrazine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Azaconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Azinphos-ethyl (Ethyl Guthion)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Azinphos-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Benalaxyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Benfluralin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bifenox	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bifenthrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bromacil	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Bromocyclen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bromophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bromophos-ethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bromopropylate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Butachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Butafenacil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Butylate	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Cadusaphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Captafol	<0.020 mg/kg	<0.020 mg/kg	mg/kg
Captan	<0.020 mg/kg	<0.020 mg/kg	mg/kg
Carbetamide	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Carbophenothion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Carbophenothion-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlordane, cis-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlordane, oxy-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlordane, trans-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlordene, beta	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Chlordene, gamma-	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Chlordimeform	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Chlorethoxyfos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorfenapyr	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorfenson	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorobenzilate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chloroneb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chloropropylate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorothalonil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorpropham (CIPC)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorpyrifos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorpyrifos-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorthal-dimethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorthiofos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorthion	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Chlozolinate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cloquintocet-mexyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Coumaphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Crimidine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Crotoxyphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyanazine	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Cyanofenphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyanophos	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Cyfluthrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyhalofop-butyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyhalothrin lambda-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cypermethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DDE, p,p'-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DDT, o,p'-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DEF (Butifos)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Deltamethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Demeton-O	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Demeton-S	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Demeton-S-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dialifos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diallate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diazinon (O Analog)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dichlobenil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dichlofenthion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dichlofluanid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dichlone	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Dichlorvos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diclobutrazol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dicloran	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dicofol, p,p-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dicrotophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dieldrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
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Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Diflufenican	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimethachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimethenamid including other mixtures of constitue	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimoxystrobin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dioxathion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diphenamid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diphenyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diphenylamine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dipropetryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Disulfoton	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Disulfoton-PS-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Endosulfan I (alpha-endosulfan)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Endosulfan II (beta-Endosulfan)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Endosulfan sulphate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Endrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Endrin ketone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Endrin-aldehyde	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
EPN	<0.010 mg/kg	<0.010 mg/kg	mg/kg
EPTC	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Esfenvalerate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethalfluralin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethoprophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethoxyquin	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Etoxazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Etridiazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Etrimfos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Famophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Famoxadone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenamidone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenchlorphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenfluthrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

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Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Fenitrothion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenoxaprop-p-ethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenpropathrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenson	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fensulfothion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenthion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenvalerate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fipronil	<0.005 mg/kg	<0.005 mg/kg	mg/kg
Fluazifop-P-butyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluchloralin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flucythrinate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluensulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flumioxazin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluotrimazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluquinconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flutolanil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flutriafol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluvalinate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Folpet	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fonofos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Gamma-cyhalothrin	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
gamma-HCH (Lindane)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Halfenprox	<0.010 mg/kg	<0.010 mg/kg	mg/kg
HCH, alpha-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
HCH, beta-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
HCH, delta-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Heptachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Heptachlor Epoxide (cis, trans)	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Hexachlorobenzene (HCB)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Hexazinone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Hydroprene	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Iprobenfos	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

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Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Iprodione	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isazophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isocarbamid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isocarbofos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isodrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isofenphos-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isopropalin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isoprothiolane	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isoxadifen-ethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Lenacil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Leptophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Malathion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Mefenpyr-diethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Mepronil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metazachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methacriphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methamidophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methoprothryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methoxychlor, o,o'	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Methoxychlor, p,p'	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Mevinphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Mexacarbate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
MGK-264	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Mirex	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Monocrotophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Naproanilide	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Napropamide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Nitralin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Nitrapyrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Nitrofen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Nitrothal-isopropyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Nonachlor, cis-	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Nonachlor, trans-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Norea	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Norflurazon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DDD, o,p'-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DDE, o,p'-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ofurace	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Omethoate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
o-Phenylphenol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Oxyfluorfen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DDD, p,p'-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
DDT, p,p'-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Paclobutrazol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Parathion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Parathion oxygen analog	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Parathion-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Parathion-methyl oxygen analog	<0.010 mg/kg	<0.010 mg/kg	mg/kg
PCB 101	<0.010 mg/kg	<0.010 mg/kg	mg/kg
PCB 138	<0.010 mg/kg	<0.010 mg/kg	mg/kg
PCB 153	<0.010 mg/kg	<0.010 mg/kg	mg/kg
PCB 180	<0.010 mg/kg	<0.010 mg/kg	mg/kg
PCB 28	<0.010 mg/kg	<0.010 mg/kg	mg/kg
PCB 52	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pebulate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pentachloranisole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pentachloroaniline	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pentachlorobenzene	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pentachlorobenzonitrile	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Pentachlorothioanisole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Penthiopyrad	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Permethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Perthane	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phenothrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
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Client Code: QD0009451
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Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Phenthoate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phorate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phorate-O-analogue	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phorate-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phosmet	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phosphamidon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Picolinafen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Picoxystrobin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Piperophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prallethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Procymidone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Profenofos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Profluralin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prometryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propazine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propetamphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propyzamide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prothioconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prothiofos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyraflufen-ethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyrazophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyridalyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyrifenox	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Quinalphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Quinomethionate (Morestan)	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Quintozene	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Quizalofop-P-ethyl	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Resmethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
S 421 (Octachlordipropylether)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Secbumeton	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Silaneophan	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01P - Pesticides Quechers GC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	**Result**	**Per Serving**	**Theoretical**
Silthiofam	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Simazine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tebupirimfos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tecnazene	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tefluthrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Terbacil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Terbuthylazine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tetrachloroaniline, 2,3,4,6-	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Tetradifon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tetrahydrophthalimide (THPI)	<0.010 mg/kg	<0.001 mg/Serving	mg/kg
Tetramethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tetrasul	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiometon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thionazin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tolclofos-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tolylfluanid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tralomethrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Transfluthrin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triazophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tribufos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Trichlorfon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Trichloronat	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Trifluralin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triticonazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Vinclozolin	<0.010 mg/kg	<0.010 mg/kg	mg/kg

QAA07 - Vomitoxin (Deoxynivalenol, DON) LC-MSMS	**Reference**	**Accreditation**	**Completed**	**Sub**
	Food Addit Contam Part A, 2013:30(3),541-9.	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	**Result**	**Per Serving**	**Theoretical**
Vomitoxin (Deoxynivalenol)	<10 µg/kg	<10 µg/kg	µg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QAA19 - Zearalenone (LC-MSMS)	**Reference**	**Accreditation**	**Completed**	**Sub**
	Food Addit Contam Part A, 2013:30(3),541-9.	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	**Result**	**Per Serving**	**Theoretical**
Zearalenone	<5.0 µg/kg	<5.0 µg/kg	µg/kg

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	**Result**	**Per Serving**	**Theoretical**
Penflufen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propamocarb (Sum of propamocarb and its salts, exp	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flubendiamide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Formetanate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Mandipropamid (any ratio of constituent isomers)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metaflumizone (sum of E- and Z- isomers)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
propisochlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Sulfentrazone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dinotefuran	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Benfuracarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluopyram	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluxapyroxad	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Sulfoxaflor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorantraniliprole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyantraniliprole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flupyradifurone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Novaluron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Rimsulfuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Spinetoram	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Spirotetramat	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tolfenpyrad	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Alachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Climbazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Clodinafop-propargyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Demeton-S-methyl-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Demeton-S-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

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Client Code: QD0009451
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Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Desmetryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimethametryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimethylvinphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Etobenzanid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isofenphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Mecarbam	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Naled	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Naphthalene Acetamide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phenkapton	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Promecarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prometon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propanil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propaquizafop	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propargite	<0.020 mg/kg	<0.020 mg/kg	mg/kg
Propham	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Propiconazole (sum of isomers)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Propoxur	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Proquinazid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prosulfocarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pymetrozine	<0.020 mg/kg	<0.020 mg/kg	mg/kg
Pyraclostrobin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyridaben	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyridaphenthion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyridate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyrimethanil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pyriproxyfen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Quinoxyfen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Rotenone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Sethoxydim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Simetryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Spinosad	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Spirodiclofen	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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Client Code: QD0009451
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Received On: 29Jul2020
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Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Spiromesifen	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Spiroxamine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Sulfotep	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Sulprofos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tebuconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tebufenozide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tebufenpyrad	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tebuthiuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Teflubenzuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tepraloxydim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Terbufos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Terbumeton	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Terbutryn	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tetrachlorvinphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tetraconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiabendazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiacloprid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiamethoxam	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiobencarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiodicarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiofanox-sulfoxide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Thiophanate-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tralkoxydim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triadimefon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triadimenol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triallate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triazamate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tricyclazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Tridemorph	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Trifloxystrobin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triflumizole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Triflumuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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Client Code: QD0009451
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Received On: 29Jul2020
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Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Triforine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Trimethacarb 2.3.5-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Trimethacarb, 3,4,5-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Uniconazole-P	<0.010 mg/kg	<0.010 mg/kg	mg/kg
1-Naphthol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
3-Hydroxycarbofuran	<0.010 mg/kg	<0.010 mg/kg	mg/kg
3-ketocarbofuran	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Abamectin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Acetamiprid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Acibenzolar-s-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Aldicarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Aldicarb-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Aldicarb-sulfoxide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Aminocarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Amitraz	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Azadirachtin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Azinphos-methyl oxon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Azoxystrobin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bendiocarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bensulide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bifenazate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bitertanol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Boscalid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bromuconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Bupirimate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Buprofezin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Butocarboxim-sulfoxide	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Carbaryl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Carbendazim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Carbofuran	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Carbofuran (Phenol)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Carbosulfan	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

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Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
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Received On: 29Jul2020
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Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Carboxin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Carfentrazone-ethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chlorfenvinphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chloridazone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Chloroxuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Clethodim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Clofentezine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Clomazone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Clothianidin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyazofamid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cycloate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cycloxydim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cymoxanil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyproconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyprodinil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Cyromazine	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Desmedipham	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pirimicarb, desmethyl-formamido-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pirimicarb, desmethyl-	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diafenthiuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diazinon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diethofencarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Difenoconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diflubenzuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimethoate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dimethomorph	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diniconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dioxacarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Diuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Dodine	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Edifenphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Epoxiconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Etaconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethiofencarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethiofencarb-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethiofencarb-sulfoxide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Ethofumesate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Etofenprox	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenamiphos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenarimol	<0.020 mg/kg	<0.020 mg/kg	mg/kg
Fenazaquin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenbuconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenhexamid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenobucarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenoxycarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenpropimorph	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fenpyroximate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flonicamid	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fludioxonil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flufenacet	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flufenoxuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluopicolide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Flusilazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fluthiacet-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Forchlorfenuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Fosthiazate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Furalaxyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Furathiocarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Heptenophos	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Hexaconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Hexaflumuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Hexythiazox	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Imazalil (any ratio of constituent isomers)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Imidacloprid	<0.010 mg/kg	<0.010 mg/kg	mg/kg

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ANALYTICAL REPORT

AR-20-QD-137885-02
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Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS	**Reference**	**Accreditation**	**Completed**	**Sub**
	AOAC 2007.01	A2LA ISO/IEC 17025:2005 2993-01	06Aug2020	1

Parameter	Result	Per Serving	Theoretical
Indoxacarb (sum, R+S isomers)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Iprovalicarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isoprocarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isoproturon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isoxaben	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Isoxaflutole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Kresoxim-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Linuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Lufenuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Malaoxon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Mepanipyrim	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metalaxyl and Metalaxyl-M (sum)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metamitron	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Methabenztiazuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methidathion	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methiocarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methiocarb-sulfone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methiocarb sulfoxide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methomyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Methoxyfenozide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metolachlor	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metolcarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metoxuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Metribuzin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Molinate	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Monolinuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Myclobutanil	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Neburon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Nitenpyram	<0.050 mg/kg	<0.050 mg/kg	mg/kg
Nuarimol	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Oxadiazon	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Oxadixyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg

AgriFiber Solutions LLC

Adam Blackshaw
1011 Campus Drive
Mundelein, IL 60060

ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2
Received On: 29Jul2020
Reported On: 12Aug2020

Eurofins Sample Code:	464-2020-07290651	**Sample Registration Date:**	29Jul2020
Client Sample Code:	CBFG2 Composite	**Condition Upon Receipt:**	acceptable, non-perishable
Sample Description:	ARABINOXYLO-OLIGOSACCHARIDE ss=100g	**Sample Reference:**	

QA01R - Pesticides Quechers-LC-MS/MS | **Reference:** AOAC 2007.01 | **Accreditation:** A2LA ISO/IEC 17025:2005 2993-01 | **Completed:** 06Aug2020 | **Sub:** 1

Parameter	Result	Per Serving	Theoretical
Oxamyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Oxydemeton-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Penconazole	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pencycuron	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pendimethalin	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phenmedipham	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phorate-sulfoxide	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Phosalone	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Piperonyl butoxide (PBO)	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pirimicarb	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pirimiphos-methyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Pirimiphos-ethyl	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Prochloraz	<0.010 mg/kg	<0.010 mg/kg	mg/kg
Profoxydim	<0.010 mg/kg	<0.010 mg/kg	mg/kg

QD03M - Nutrition Facts Panel | **Reference:** Genesis | **Completed:** 30Jul2020

Parameter	Result	Per Serving	Theoretical
Nutrition Label Format Report	Requested	Requested	

Comments:
Updated protein factor + calculation for dietary fiber per client.

Subcontracting partners:
1 - Eurofins Central Analytical Laboratories, LA

AgriFiber Solutions LLC

Adam Blackshaw
1011 Campus Drive
Mundelein, IL 60060

ANALYTICAL REPORT

AR-20-QD-137885-02
Report Supersedes AR-20-QD-137885-01

Client Code: QD0009451
PO Number: CBFG2

Received On: 29Jul2020
Reported On: 12Aug2020

Respectfully Submitted,

David Gross
Support Services Manager

Results shown in this report relate solely to the item submitted for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of Eurofins Scientific, Inc. | All work done in accordance with Eurofins General Terms and Conditions of Sale: www.eurofinsus.com/terms_and_conditions.pdf | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at Eurofins. Measurement of uncertainty can be obtained upon request.

EXHIBIT II.

GRAS Panel Report

35 pages of confidential information removed in accordance with Exemption 4 of the Freedom of Information Act

From: Zhang, Janet
To: Craig Llewellyn
Subject: RE: [EXTERNAL] GRN 000998
Date: Tuesday, October 5, 2021 9:09:00 AM
Attachments: image002.png
Questions for GRN_998.pdf

Good morning Craig.

Attached is the questions for GRN000998. Other paperwork will follow soon.

Thank you for your patience.

Best regards,
Janet

Jianrong (Janet) Zhang, Ph.D.
FDA/OFVM/CFSAN/OFAS/DST
College Park, MD 20740
Phone: 240-402-1327
janet.zhang@fda.hhs.gov

From: Craig Llewellyn <Craig.Llewellyn@safebridge.com>
Sent: Tuesday, September 21, 2021 12:02 PM
To: Zhang, Janet <Janet.Zhang@fda.hhs.gov>
Cc: Julia Parker <Julia.Parker@safebridge.com>
Subject: RE: [EXTERNAL] GRN 000998

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Janet,

I hope that you have been well. I would like to follow up with you on the necessary paperwork.

Kind regards,
Craig

G. Craig Llewellyn, PhD
Principal Toxicologist and Scientific Director
SafeBridge® Regulatory & Life Sciences Group
154 Hansen Road, Suite 201
Charlottesville, VA 22911 USA
Tel: 434.977.5957 | Fax: 434.977.1856
craig.llewellyn@safebridge.com | www.toxregserv.com | https://www.linkedin.com/in/craig-llewellyn-2b947226/

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- Safety and hazard assessments for food ingredients, specialty chemicals, pharmaceuticals, and cosmetic ingredients
- Global regulatory strategy development and approval submissions
- Toxicology and safety testing program design, implementation and oversight
- Remote Quality Assurance consulting and auditing for Good Laboratory Practice (GLP) compliance
- Remote GLP training program design and implementation

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From: Zhang, Janet <Janet.Zhang@fda.hhs.gov>
Sent: Monday, September 13, 2021 8:38 AM
To: Craig Llewellyn <Craig.Llewellyn@safebridge.com>
Cc: Julia Parker <Julia.Parker@safebridge.com>
Subject: RE: [EXTERNAL] GRN 000998

Good morning Craig.

Thank you for letting me know your decision. I will follow up with documents soon.

Best regards,
Janet

Jianrong (Janet) Zhang, Ph.D.
FDA/OFVM/CFSAN/OFAS/DST
College Park, MD 20740
Phone: 240-402-1327

janet.zhang@fda.hhs.gov

U.S. FOOD & DRUG ADMINISTRATION

From: Craig Llewellyn <Craig.Llewellyn@safebridge.com>
Sent: Friday, September 10, 2021 4:07 PM
To: Zhang, Janet <Janet.Zhang@fda.hhs.gov>
Cc: Julia Parker <Julia.Parker@safebridge.com>
Subject: [EXTERNAL] GRN 000998

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Janet,

Thank you for coordinating the meeting with us on Friday, 10 September 2021. As Agent to AgriFiber LLC, we respectfully request that the FDA cease to evaluate GRN 000998 on corn bran arabinoxylan, dated 10 March 2021, and filed with FDA on 6 July 2021.

Kind regards,
Craig

G. Craig Llewellyn, PhD
Principal Toxicologist and Scientific Director
SafeBridge® Regulatory & Life Sciences Group
154 Hansen Road, Suite 201
Charlottesville, VA 22911 USA
Tel: 434.977.5957 | Fax: 434.977.1856
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- Global regulatory strategy development and approval submissions

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- Remote Quality Assurance consulting and auditing for Good Laboratory Practice (GLP) compliance
- Remote GLP training program design and implementation

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Questions raised during the review of GRN 000998 for Corn Bran Arabinoxylan

1. In several sections of the notice, the notifier implies that the science review prepared by FDA entitled, "Review of the Scientific Evidence on the Physiological Effects of Certain Non-Digestible Carbohydrates," evaluated the safety of arabinoxylan (FDA, 2018[1]). This is not the case. The purpose of that review was to discuss the scientific evidence related to the physiological effects of isolated or synthetic non-digestible carbohydrates that are beneficial to human health (e.g., reducing post-prandial blood glucose or increasing calcium absorption). Therefore, FDA did not discuss and did not evaluate the safety of arabinoxylan in the 2018 science review. Please rewrite the following sections of the notice such that this implication is corrected/clarified.

   Page 19, Section D, second paragraph
   Page 24, Section B (i.e., indirectly as a rationale for secondary literature search)
   Page 27, First paragraph
   Page 30, Fourth paragraph

2. On page 23, the notifier states, "The structural complexity of AX varies greatly by source." However, we note that none of the safety studies discussed in Section 6 utilize arabinoxylan from corn bran as the test article. To support the safety of corn bran arabinoxylan, "bridging" the safety of related ingredients used as test articles in published studies to the article of commerce is critical. The following questions relate to this safety argument.

   a. To support a robust "bridging" argument, a comparison of the test article to the article of commerce is key. For each published study that AgriFiber considers critical to the conclusion of safety for corn bran arabinoxylan, please provide a comparison of the test article in the published study to AgriFiber's article of commerce. For any differences which are identified, please provide a narrative that discusses why these differences are not expected to be a safety concern.

   b. For example, AgriFiber discusses François et al., 2012 which is a 90-day repeated dose feeding study in rats using wheat bran extract. On page 480, this article states, "It is important to subject industrially produced WBE [wheat bran extract] to a safety assessment because the average chain length and the nature of branching of the AXOS [arabinoxylan-oligosaccharides] polymers is specific to the manufacturing method." In the context of this statement, please explain the scientific rationale used by AgriFiber to conclude that the physical and chemical structure of wheat bran extract is similar enough to corn bran arabinoxylan to validate using this 90-day repeated dose feeding study to reach a GRAS conclusion for corn bran arabinoxylan.

   c. Given that no safety studies are presented using the article of commerce itself, potential safety concerns of antinutrients known to be present in corn are not addressed. Please identify any antinutrients (e.g., phytate, lectins, trypsin inhibitors) that may be present in the corn bran arabinoxylan. If any antinutrients are present, please provide a narrative that discusses why these antinutrients are not expected to be a safety concern for the intended use.

3. On page 28, AgriFiber discusses the clinical study by Nguyen et al., 2020 which uses corn bran arabinoxylan as the test article. However, the relationship between the article of commerce and the test article used in this study is not clear. For example, the arabinose-to-xylose ratio of the test article used in the study is stated to be 0.56 (page 14) whereas the arabinose-to-xylose ratio of the article of commerce is stated to be around 0.84 to

[1] https://www.fda.gov/food/food-labeling-nutrition/review-scientific-evidence-physiological-effects-certain-non-digestible-carbohydrates

0.88 in the GRAS notice. Please explain why the difference in the arabinose-to-xylose ratios does not impact the extrapolation of data from Nguyen et al., 2020 to the GRAS conclusion of the notified ingredient.

4. A major maize allergen has been identified as a lipid transfer protein,[2] and according to Goodman et al., 2013,[3] this protein is "produced and stored in the pericarp of the grain just under the waxy seed coat as well as throughout the embryo of mature grain . . ." Given that the protein content of corn bran arabinoxylan is between 5.19% and 5.75% (Table 4; page 10), please discuss whether the potential presence of this lipid transfer protein in the notified ingredient is expected to be a safety concern. As part of this discussion, please also indicate if the literature search as described on page 24 captured any updated or relevant literature on corn allergy.

5. Multiple articles listed in Part 7: References contain the notation "[As cited in: . . .]" despite these articles being primary research studies and/or being available in the public domain. We note that it is the responsibility of the notifier to review all of the relevant scientific literature in order to make their own independent GRAS conclusion.

    a. For published articles listed in Part 7 as "As cited in: FDA, 2018," "As cited in: EFSA, 2018," "As cited in: Deehan et al., 2021 (Unpublished report)," and "As cited in François et al, 2010," please clarify if AgriFiber independently reviewed these articles during the preparation of the current GRAS notice. If not, please clarify how AgriFiber can reach a GRAS conclusion without independent review of these studies and reports.

    b. Additionally, some published articles are listed in Part 7 as "As cited in: GRN 343." Please clarify if AgriFiber's intention is to incorporate these articles by reference. If so, clearly state this intention, describe the information being incorporated, and provide the page number(s) of GRN 343 where the information can be found.

6. We note that the GRAS Panel Report is marked "confidential." To be considered as part of the GRAS dossier, this report cannot be kept confidential. Please provide a copy of the GRAS Panel Report which does not contain confidential information. We note that the inclusion of curricula vitae for the GRAS panel members is not required as part of a GRAS Panel Report.

7. Please indicate if the analytical methods used for all analyses are validated and fit for purpose.

8. In your dietary exposure section, you state that corn bran arabinoxylan is intended for use in plant-based dairy alternatives, plant-based meat substitutes and chocolate and non-chocolate candies/confections. However, these categories do not have a corresponding use level associated with them. You also mention that their contribution would be negligible to the overall dietary exposure to this ingredient. Please provide the intended use levels of corn bran arabinoxylan in these food categories.

9. The dietary exposure section references previous GRNs for a variety of dietary fiber ingredients that you state your ingredient is substitutional for, with ranges presented for the mean and 90th percentiles. Please provide a dietary exposure estimate for the proposed uses of your ingredient which includes plant-based dairy

[2] Pastorello et al. (2000) The maize major allergen, which is responsible for food-induced allergic reactions, is a lipid transfer protein. *J Allergy Clin Immunol*. 106:744-751.

[3] Goodman et al. (2013) Evaluation of endogenous allergens for the safety evaluation of genetically engineered food crops: review of potential risks, test methods, examples, and relevance. *J Agric Food Chem*. 61:8317:8332.

alternatives, meat substitutes and chocolate and non-chocolate candies/confections using the most recent food consumptiondata . Please also provide a cumulative dietary exposure estimate for dietary fiber.

10. Please provide safety information regarding the enzyme used (endo-β-1,4-xylanase) to hydrolyze the corn hull fiber to lower MW fractions. Such information would include the safety of the enzyme, safety of the source, and if the enzyme is expected to be in the final food.