Donald F. Schmitt, M.P.H.
Tox Strategies, Inc.
931 West 75th Street, PMB 255
Naperville, IL 60565

Re: GRAS Notice No. GRN 000849

Dear Mr. Schmitt:

The Food and Drug Administration (FDA, we) completed our evaluation of GRN 000849. We received the notice that you submitted on behalf of Intrinsic Organics, LLC (Intrinsic Organics) on February 11, 2019, and filed it on May 7, 2019. Intrinsic Organics submitted amendments to the notice on July 10, 2019, September 11, 2019, September 13, 2019, and October 15, 2019, that clarified the calculation of equivalent use levels, and provided additional information on the composition, analytical methods, stability, and the timeframe for the literature search conducted.

The subject of the notice is inulin from Jerusalem artichoke (JA inulin) for use as a bulking agent in 43 food categories at the following use levels: 1–1.4 g/serving in infant and toddler foods, 5–7 g/serving in ready-to-eat breakfast cereals, and 0.5–21 g/100 g in other foods, including meat and poultry products.[1] The notice informs us of Intrinsic Organics' view that this use of JA inulin is GRAS through scientific procedures.

Our use of the term, "inulin from Jerusalem artichoke" or "JA inulin" in this letter is not our recommendation of that term as an appropriate common or usual name for declaring the substance in accordance with FDA's labeling requirements. Under 21 CFR 101.4, each ingredient must be declared by its common or usual name. In addition, 21 CFR 102.5 outlines general principles to use when establishing common or usual names for nonstandardized foods. Issues associated with labeling and the common or usual name of a food ingredient are under the purview of the Office of Nutrition and Food Labeling (ONFL) in the Center for Food Safety and Applied Nutrition. The Office of Food Additive Safety (OFAS) did not consult with ONFL regarding the appropriate common or usual name for "inulin from Jerusalem artichoke" or "JA inulin."

Intrinsic Organics provides information on the source, identity, and composition of JA inulin. Intrinsic Organics states that JA inulin is extracted from the tubers of Jerusalem artichoke (*Helianthus tuberosus*). Intrinsic Organics describes two JA inulin formulations as either a brown syrup or a tan powder, each containing ≥80% carbohydrate on a dry basis, of which ≥65% is inulin. Intrinsic Organics describes inulin as a mixture of oligo- and polysaccharides consisting of fructose units joined by β(2-1) linkages and one terminal glucosyl unit with the degree of polymerization (DP) ranging

[1] Intrinsic Organics states that serving sizes correspond to reference amounts commonly consumed per eating occasion as set forth in 21 CFR 101.12.

from 3 to over 60. Inulin has the chemical formula $C_{6n}H_{10n+2}O_{5n+1}$ and is designated by CAS Registry Number 9005-80-5.

Intrinsic Organics describes the method of manufacture of JA inulin. The tubers of Jerusalem artichoke are washed, cut, and extracted with hot water. The resulting aqueous extract is filtered in several steps to remove solids, proteins, simple carbohydrates, minerals, and excess water. The concentrated liquid undergoes a heat treatment kill step and is either further concentrated by evaporation to a syrup or spray-dried to a powder before the final packaging. Intrinsic Organics states that no processing aids are used in the manufacture of JA inulin, that all membranes are permitted for use in the manufacture of food, and that JA inulin is manufactured in accordance with good manufacturing practices.

Intrinsic Organics provides specifications for JA inulin that include a minimum content of total solids (≥65% in syrup and ≥90% in powder) and inulin with a DP of 3 to over 60 (≥65% on dry weight basis). Specifications also include limits for glucose, fructose, and sucrose (≤20% combined), protein (≤10%), ash (≤10%), arsenic, lead, mercury, and cadmium (<0.05 mg/kg each), microorganisms, pesticides, and mycotoxins. Intrinsic Organics provides the results of non-consecutive batch analyses of the JA inulin syrup and powder to demonstrate that JA inulin can be manufactured to meet the specifications. Intrinsic Organics provides stability data demonstrating that JA inulin syrup and powder are stable for a period of at least nine and ten months, respectively, when stored under ambient conditions.

Intrinsic Organics states that JA inulin is intended to be used in the same food categories and at use levels equivalent to those specified for inulin from the chicory plant (≥90% inulin) in GRN 000118 and its supplement.[2] Intrinsic Organics states that the following estimates of dietary exposure at the 90th percentile were reported for inulin in GRN 000118: ~6 g/day for non-breastfeeding infants <1 year of age, ~15 g/day for infants one year of age, and 19.2 g/day for the general population (≥2 years of age). Intrinsic Organics states that inulin is naturally present in many edible fruits and vegetables and reports a background average dietary exposure to inulin to be 2.6 g/day in the U.S. Intrinsic Organics concludes that because the use of JA inulin will be substitutional for that of inulin in GRN 000118 and its supplement, the overall dietary exposure to inulin will not increase. Intrinsic Organics states that the use levels of JA inulin in food are self-limiting due to technological reasons as well as consumer acceptability.

Intrinsic Organics states that inulin and other fructans are not digested in the gastrointestinal tract because they are resistant to hydrolysis by human digestive enzymes, such as alpha glucosidase, maltase-isomaltase, and sucrase that are specific for glycosidic linkages. Intrinsic Organics briefly discusses published short-term and long-

[2] Inulin from the root of the chicory plant (≥90% inulin) was the subject of GRN 000118. FDA evaluated this notice and its supplement, and responded in letters dated May 5, 2003, and January 16, 2008, respectively, stating that the agency had no questions at that time regarding the notifier's conclusions.

term animal studies, as well as in vitro genetic toxicity studies on fructans. These studies demonstrated no toxicologically relevant effects, as well as a lack of genotoxic potential of inulin and other fructans. Intrinsic Organics discusses human studies with inulin and other fructans demonstrating that JA inulin is well tolerated following oral consumption. Intrinsic Organics reports the opinion of several international regulatory authorities, such as Health Canada and the European Food Safety Authority, which allow the consumption of 12-15 g chicory inulin (a similar substance) per day. Intrinsic Organics states that literature searches have been performed to identify available safety data on inulin and Jerusalem artichoke through December 2018.

Intrinsic Organics includes the report of a panel of individuals (Intrinsic Organics' GRAS panel). Based on its review, Intrinsic Organics' GRAS panel concluded that JA inulin is safe under the conditions of its intended use.

Based on the data and information presented in the notice, Intrinsic Organics concludes that JA inulin is GRAS for its intended use.

Standards of Identity

In the notice, Intrinsic Organics states its intention to use JA inulin in several food categories, including foods for which standards of identity exist, located in Title 21 of the Code of Federal Regulations. We note that an ingredient that is lawfully added to food products may be used in a standardized food only if it is permitted by the applicable standard of identity.

Potential Labeling Issues

Under section 403(a) of the Federal Food, Drug, and Cosmetic Act (FD&C Act), a food is misbranded if its labeling is false or misleading in any way. Section 403(r) of the FD&C Act lays out the statutory framework for labeling claims characterizing a nutrient level in a food or the relationship of a nutrient to a disease or health-related condition (also referred to as nutrient content claims and health claims). If products containing JA inulin bear any nutrient content or health claims on the label or in labeling, such claims are subject to the applicable requirements and are under the purview of ONFL. OFAS did not consult with ONFL on this issue or evaluate any information in terms of labeling claims. Questions related to food labeling should be directed to ONFL.[3]

Potential Requirement for a Color Additive Petition

There is no GRAS provision for color additives. In the notice, Intrinsic Organics notes

[3] The definition of "dietary fiber" in 21 CFR 101.9(c)(6)(i) was added by FDA's final rule revising the nutrition and supplement facts labels (81 FR 33742, May 27, 2016). This final rule, among other things, defines dietary fiber as non-digestible soluble and insoluble carbohydrates (with three or more monomeric units), and lignin that are intrinsic and intact in plants; isolated or synthetic non-digestible carbohydrates (with three or more monomeric units) determined by FDA to have physiological effects that are beneficial to human health.

that JA inulin has color (e.g., describes the syrup as a brown liquid). As such, the use of JA inulin in food products may constitute a color additive use under section 201(t)(1) of the FD&C Act and FDA's implementing regulations in 21 CFR Part 70. Under section 201(t)(1) and 21 CFR 70.3(f), a color additive is a material that is a dye, pigment, or other substance made by a synthetic process or similar artifice, or is extracted, isolated, or otherwise derived from a vegetable, animal, mineral, or other source. Under 21 CFR 70.3(g), a material that otherwise meets the definition of a color additive can be exempt from that definition if it is used (or is intended to be used) solely for a purpose or purposes other than coloring. Our response to GRN 000849 is not an approval for use as a color additive nor is it a finding of the Secretary of the Department of Health and Human Services within the meaning of section 721(b)(4) of the FD&C Act. Questions about color additives should be directed to the Division of Food Ingredients in the OFAS.

Use in Products under USDA Jurisdiction

As provided under 21 CFR 170.270, during our evaluation of GRN 000849, we coordinated with the Food Safety and Inspection Service (FSIS) of the United States Department of Agriculture. Under the Federal Meat Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act, FSIS determines the efficacy and suitability of ingredients used in meat, poultry, and egg products, and prescribes safe conditions of use. Suitability relates to the ingredient's effectiveness in performing its intended technical effect and the assurance that the ingredient's use will not result in products that are adulterated or misleading for consumers.

FSIS has previously evaluated the use of inulin as a water binder, emulsifier, stabilizer and texturizer at levels of 2–5% in processed meat food products[4] and at a level of 4% in non-standardized meat and poultry products.[3] For GRN 000849 FSIS advises that, based on the current use of inulin in the production of meat and poultry products, FSIS has no objection to the use of Jerusalem artichoke inulin as a water binder, emulsifier, stabilizer and texturizer at levels 2–5% of the product formulation in various meat and poultry products where binders are permitted. For standardized meat and poultry products, binder limits as per the standard of identity would apply. FSIS further advises that this ingredient would require labeling as "inulin" or "Jerusalem artichoke inulin (powder form) and "inulin syrup" or "Jerusalem artichoke inulin syrup" (syrup form).

FSIS requested that we advise you to seek regulatory guidance from its Risk Management and Innovations Staff (RMIS) about the use of JA inulin in meat, poultry, and egg products. You should direct such an inquiry to Dr. Melvin Carter, Director,

[4] In a letter dated May 9, 1997, from FSIS to FDA, FSIS requested consultation with FDA regarding a request, from Imperial-Suiker Unie, that FSIS advise Imperial-Suiker Unie of the acceptability of the use of inulin as a water binder, emulsifier, stabilizer and texturizer at levels of 2–5% in processed meat food products. In a letter dated May 14, 1999, FDA informed FSIS that FDA had completed its evaluation of the information submitted by Imperial-Suiker Unie as well as other information available to the agency. Based on its evaluation, FDA determined that, at that time, the agency would not challenge Imperial-Suiker Unie's conclusion that inulin is GRAS under the proposed conditions of use.

RMIS, Office of Policy and Program Development, FSIS by email at Melvin.Carter@usda.gov.

Section 301(ll) of the FD&C Act

Section 301(ll) of the FD&C Act prohibits the introduction or delivery for introduction into interstate commerce of any food that contains a drug approved under section 505 of the FD&C Act, a biological product licensed under section 351 of the Public Health Service Act, or a drug or a biological product for which substantial clinical investigations have been instituted and their existence made public, unless one of the exemptions in section 301(ll)(1)-(4) applies. In our evaluation of Intrinsic Organics' notice concluding that JA inulin is GRAS under its intended conditions of use, we did not consider whether section 301(ll) or any of its exemptions apply to foods containing JA inulin. Accordingly, our response should not be construed to be a statement that foods containing JA inulin, if introduced or delivered for introduction into interstate commerce, would not violate section 301(ll).

Conclusions

Based on the information that Intrinsic Organics provided, as well as other information available to FDA, we have no questions at this time regarding Intrinsic Organics' conclusion that JA inulin is GRAS under its intended conditions of use. This letter is not an affirmation that JA inulin is GRAS under 21 CFR 170.35. Unless noted above, our review did not address other provisions of the FD&C Act. Food ingredient manufacturers and food producers are responsible for ensuring that marketed products are safe and compliant with all applicable legal and regulatory requirements.

In accordance with 21 CFR 170.275(b)(2), the text of this letter responding to GRN 000849 is accessible to the public at www.fda.gov/grasnoticeinventory.

Sincerely,

Susan J. Carlson -S

Digitally signed by Susan J. Carlson -S
Date: 2019.10.30 12:23:02 -04'00'

Susan Carlson, Ph.D.
Director
Division of Food Ingredients
Office of Food Additive Safety
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cc: Melvin Carter, Ph.D.
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