



Timothy Murbach, ND, DABT  
AIBMR Life Sciences, Inc.  
2800 E. Madison  
Seattle, WA 98112

Re: GRAS Notice No. GRN 000836

Dear Mr. Murbach:

The Food and Drug Administration (FDA, we) completed our evaluation of GRN 000836. We received the notice that you submitted on behalf of Xiamen Huison Biotech Co., LTD (Xiamen Huison) on January 28, 2019, and filed it on March 7, 2019.

The subject of the notice is algal oil (50-60% docosahexaenoic acid [DHA]) from *Schizochytrium* sp. strain HS01 (algal oil) for use as an ingredient in gelatin desserts or salads at a maximum concentration of 0.33% and in vegetable oils at up to 3%. The notice informs us of Xiamen Huison's view that these uses of algal oil are GRAS through scientific procedures.

Our use of the term "algal oil" 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 "algal oil."

Xiamen Huison describes algal oil as a clear yellow liquid produced by *Schizochytrium* sp. strain HS01. Algal oil contains 50-60% DHA, as well as other fatty acids, primarily palmitic acid and docosapentaenoic acid at approximately 30% and 10%, respectively.

Xiamen Huison describes the method of manufacture for algal oil by the marine alga *Schizochytrium* sp. strain HS01. Xiamen Huison states that *Schizochytrium* sp. strain HS01 is non-pathogenic and non-toxicogenic. A pure culture of *Schizochytrium* sp. strain HS01 is grown under controlled pH and temperature conditions. Following fermentation, the algal cell walls are mechanically broken, followed by centrifugation to release the crude algal oil. The oil is heated under alkaline conditions to remove impurities and free fatty acids, and then washed, vacuum dried, crystallized and filtered to remove wax. Further refining involves a second crystallization and filtration step to separate the winterized oil. Decoloring sand is added to improve the color and the oil is diluted with high-oleic sunflower oil. Odors and oxides are then removed using high

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temperature and pressure steam. Finally, antioxidants (vitamin E and citric acid) are added to the oil and it is packaged in aluminum drums under nitrogen. Xiamen Huison states that all raw materials used are food-grade and the algal oil is produced in accordance with current good manufacturing practices.

Xiamen Huison provides specifications for algal oil as follows: DHA content (50-60%), free fatty acids (< 0.3%), trans fatty acids ( $\leq$  1%), unsaponifiable matter ( $\leq$  4%), moisture ( $\leq$  0.05%), anisidine value (< 10), peroxide value ( $\leq$  5.0 meq/kg), total oxidation value (< 20), acid value ( $\leq$  1.0 mg potassium hydroxide/g), lead ( $\leq$  0.1 mg/kg), arsenic ( $\leq$  0.1 mg/kg), mercury ( $\leq$  0.1 mg/kg), cadmium ( $\leq$  0.5 mg/kg) and specified limits for microorganisms. Xiamen Huison provides the results of five non-consecutive batch analyses to demonstrate that algal oil can be manufactured to meet these specifications.

Xiamen Huison provides dietary exposure to algal oil estimated using food consumption data from the National Health and Nutrition Examination Surveys (NHANES, 2013-2014). The eaters-only mean and 90<sup>th</sup> percentile dietary exposures for the U.S. population aged 2 years and older are 254 mg/person (p)/day (d) (4 mg/kg body weight (bw)/d) and 460 mg/p/d (9 mg/kg bw/d), respectively.

Xiamen Huison states that fatty acids present in algal oil are predominately (99%) triacylglycerols. Xiamen Huison discusses the metabolism of algal oil by discussing the metabolism of triacylglycerols. Xiamen Huison also provides a summary of published safety studies on algal oil. Xiamen Huison states that an updated literature search was conducted through December 6, 2018. Published studies on algal oil from *Schizochytrium* sp., as well as other sources, showed that there were no toxicologically relevant effects in rats following gavage administration of up to 5,000 mg/kg bw/d of algal oil or dietary administration of up to 5% algal oil. Xiamen Huison states that several published studies demonstrated that algal oil derived from *Schizochytrium* sp. is not mutagenic or genotoxic. Xiamen Huison also states that numerous published studies in adults, children, and infants with algal oil from *Schizochytrium* sp. and other sources, such as fish and marine-based organisms, demonstrated that algal oil was well tolerated and there were no significant, consumption-related adverse effects.

Based on the data and information described above, Xiamen Huison concludes that algal oil is GRAS for its intended use.

### **Potential Labeling Issues**

Under section 403(a) of the Federal Food Drug & Cosmetic (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. In the notice, Xiamen Huison cites studies that describe algal oil as having certain health benefits. If products containing algal oil 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.

### **Potential Requirement for a Color Additive Petition**

There is no GRAS provision for color additives. In the notice, Xiamen Huison notes that algal oil has a yellow color. As such, the use of algal oil 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 000836 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 OFAS.

### **Section 301(II) of the FD&C Act**

Section 301(II) 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(II)(1)-(4) applies. In our evaluation of Xiamen Huison's notice concluding that algal oil is GRAS under its intended conditions of use, we did not consider whether section 301(II) or any of its exemptions apply to foods containing algal oil. Accordingly, our response should not be construed to be a statement that foods containing algal oil, if introduced or delivered for introduction into interstate commerce, would not violate section 301(II).

### **Conclusions**

Based on the information that Xiamen Huison provided, as well as other information available to FDA, we have no questions at this time regarding Xiamen Huison's conclusion that algal oil is GRAS under its intended conditions of use. This letter is not an affirmation that algal oil 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 000836 is accessible to the public at [www.fda.gov/grasnoticeinventory](http://www.fda.gov/grasnoticeinventory).

Sincerely,

Susan J.

Carlson -S

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Susan Carlson, Ph.D.

Director

Division of Food Ingredients

Office of Food Additive Safety

Center for Food Safety

and Applied Nutrition