



Xiaowei Shi
Smith Business Services, LLC
19 Wintergreen Avenue East
Edison, NJ 088200

Re: GRAS Notice No. GRN 000779

Dear Mr. Shi:

The Food and Drug Administration (FDA, we) completed our evaluation of GRN 000779. We received the notice that you submitted on behalf of Baolingbao Biology Co., Ltd. (Baolingbao) on April 13, 2018, and filed it on May 7, 2018. Baolingbao submitted amendments to the notice on July 3, 2018, July 17, 2018, and September 9, 2018. These amendments include an updated list of food categories, additional information regarding the toxicity studies discussed in the notice, English translations of two publications, and the timeframe for the literature search performed.

The subject of the notice is isomalto-oligosaccharide mixture (IMOM) for use as a sweetener in baked goods and baking mixes; beverages and beverage bases; breakfast cereals; condiments and relishes; dairy product analogs; mayonnaise and mayonnaise-type dressings; salad dressings; frozen dairy desserts and mixes; gelatins, puddings, and fillings; gravies and sauces; hard candies; jams and jellies; meal replacement bars and mixes; milk and milk products; nut products; processed fruits and fruit juices; snack foods; soft candies; sweet sauces, toppings, and syrups; processed vegetables and vegetable juices at levels ranging from 1.5 to 15 g/serving, as well as a table top sweetener.^{1,2} The notice informs us of Baolingbao's view that this use of IMOM is GRAS through scientific procedures.

Our use of the term "isomalto-oligosaccharide mixture" or "IMOM" 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

¹ Baolingbao states that IMOM is not intended for use in food products regulated by the U.S. Department of Agriculture or for use in infant formulas.

² Baolingbao states that the serving sizes are based on reference amounts customarily consumed per eating occasion (21 CFR 101.12).

Food Additive Safety did not consult with ONFL regarding the appropriate common or usual name for “isomalto-oligosaccharide mixture.”

Baolingbao provides information about the identity and composition of IMOM. Baolingbao describes IMOM as a clear to pale yellow syrup or a white powder comprised of oligosaccharides primarily consisting of 3 to 7 glucose units, along with disaccharides and longer oligosaccharides (up to 9 units).

Baolingbao describes the manufacturing process for IMOM. Corn starch is mixed with water to create a slurry and hydrolyzed enzymatically using α -amylase enzyme preparations from *Bacillus licheniformis* and *Aspergillus oryzae*. An α -glucosidase enzyme preparation from *Aspergillus niger* is used to convert the α -(1,4)-linkages of maltose and malto-oligosaccharides to isomalto α -(1,6)-linkages. The notifier states that enzyme preparations used during manufacture of IMOM are from nonpathogenic and nontoxicogenic sources, and safe for use in food. Subsequent to the enzyme treatments steps, the temperature of the mixture is increased to at least 90°C to inactivate them. The resulting mixture is subjected to several purification steps, including decolorization, filtration, and chromatographic separation, to minimize residual enzyme preparations and processing aids, if any. The purified mixture is then concentrated to form a syrup, and spray dried to a powder. Baolingbao states that the entire process is consistent with current good manufacturing practices.

Baolingbao provides food grade specifications for IMOM. These include an assay for isomalto-oligosaccharides ($\geq 90\%$, dry basis), limits for arsenic (≤ 0.5 mg/kg), lead (≤ 0.5 mg/kg), sulfur dioxide (≤ 40 mg/kg), and microbial contaminants. Baolingbao provides results from three non-consecutive batch analyses to demonstrate that IMOM can be manufactured to meet specifications. Baolingbao states that IMOM is stable for at least one year when stored under defined conditions.

Baolingbao provides an estimate of the dietary exposure to IMOM to be 30 g/person/day (d) (0.5 g/kg body weight (bw)/d)³ based on the assumption that IMOM would replace two servings of sucrose per person per day. Baolingbao states that the intended uses of IMOM are substitutional for the uses in the food categories that were specified in GRNs 000246⁴ and 000674.⁵

Baolingbao discusses publicly available data and information supporting the safety of IMOM and cites GRN 000246.⁴ Baolingbao reports that a scientific literature search was conducted through June 2017. The published studies include animal subchronic and chronic toxicity studies in rats conducted with isomalto-oligosaccharides similar to

³ FDA used 60 kg as the adult body weight in this calculation.

⁴ GRN 000246 describes the use of IMOM in a number of food categories. FDA evaluated this notice and responded in a letter dated February 10, 2009, stating that we had no questions at that time regarding BioNeutra Inc.'s GRAS conclusion.

⁵ GRN 000674 describes the use of isomalto-oligosaccharide mixture with reduced mono- and disaccharides in a number of food categories. FDA evaluated this notice and responded in a letter dated July 5, 2017, stating that we had no questions at that time regarding BioNeutra North America Inc.'s GRAS conclusion.

IMOM. Baolingbao states that no toxicologically relevant adverse effects were noted at the dietary level of 20% (~10 g/kg bw/d)⁶ in the subchronic studies and at 3% (~2.7 to 5.0 g/kg bw/d) in drinking water in the chronic study. Baolingbao states that published Ames assays and a chromosome aberration test showed that isomalto-oligosaccharides are non-genotoxic.

Baolingbao includes the report of a panel of individuals (Baolingbao's GRAS panel). Based on its review, Baolingbao's GRAS panel concluded that IMOM is safe under the conditions of its intended use.

Based on the information presented in the notice, Baolingbao concludes that IMOM is GRAS for its intended use in foods.

Standards of Identity

In the notice, Baolingbao states its intention to use IMOM 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.

Labeling of Sulfite Content

Under 21 CFR 101.100(a)(4), which requires that any products containing sulfites at or above 10 parts per million declare the presence of sulfites on the label, IMOM must declare the presence of sulfites on the label.

Section 301(II) of the Federal Food, Drug and Cosmetic Act (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 Baolingbao's notice concluding that IMOM 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 IMOM. Accordingly, our response should not be construed to be a statement that foods containing IMOM, if introduced or delivered for introduction into interstate commerce, would not violate section 301(II).

Conclusions

Based on the information that Baolingbao provided, as well as other information

⁶ Baolingbao states that a dietary level of 20% corresponds to ~20 g/kg bw/d; however, based on FDA's calculations this level corresponds to ~10 g/kg bw/d.

available to FDA, we have no questions at this time regarding Baolingbao's conclusion that IMOM is GRAS under its intended conditions of use. This letter is not an affirmation that IMOM 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 000779 is accessible to the public at www.fda.gov/grasnoticeinventory.

Sincerely,

**Michael A.
Adams -S**

Dennis M. Keefe, Ph.D.
Director
Office of Food Additive Safety
Center for Food Safety
and Applied Nutrition

Digitally signed by Michael
A. Adams -S

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