Dr. Nicholas Monsul
Quorum Innovations, LLC
2068 Hawthorne, Suite 102
Sarasota, FL 34239

Re: GRAS Notice No. GRN 000988

Dear Dr. Monsul:

The Food and Drug Administration (FDA, we) completed our evaluation of GRN 000988. We received the notice that you submitted on behalf of Quorum Innovations, LLC 's (Quorum) on December 29, 2020, and filed it on July 14, 2021. You submitted amendments to the notice on December 3, 2021, January 19, 2022, and February 25, 2022, providing information about the production organism, intended use, manufacturing, dietary exposure, and specifications.

The subject of the notice is *Limosilactobacillus fermentum* LfQi6[1] preparation for use as an ingredient at a maximum level of 10^{10} colony forming units (CFU)/serving to provide $2x10^8$ CFU/serving[2] in fluid milk and milk drinks, milk-based desserts and meal replacements, flavored dairy beverages, dry and powdered milk, yogurt, cheese, ready-to-eat cereals, fruit juices, nectars, ades, and drinks, confections including chocolate and gummy candy, baked goods, and chewing gum.[3] The notice informs us of Quorum's view that this use of *L. fermentum* LfQi6 is GRAS through scientific procedures.

Quorum provides information on the identity of *L. fermentum* LfQi6 and states that *L. fermentum* LfQi6 was isolated from the human microbiome and is deposited in American Type Culture Collection with the accession number ATCC No. PTA-122195. *L. fermentum LfQi6* is a Gram-positive, non-spore forming, rod-shaped bacterium. Quorum discusses the phenotypic and genotypic characteristics used to confirm the strain's identity and states that the strain is non-pathogenic and non-toxigenic.

Quorum describes the manufacture of *L. fermentum* LfQi6 as a batch-type fermentation process, noting that the processing aids, fermentation medium and diluents used in the manufacturing process are either approved as food additives or are GRAS for their intended uses. After fermentation, the bacterial cells are harvested by centrifugation, washed, dried, milled, and standardized with food grade diluents (e.g., maltodextrin) to obtain a specified cell concentration. The final product is a free-flowing, cream to light-

[1] We note that *Lactobacillus fermentum* was reclassified as *Limosilactobacillus fermentum* as reported in Zheng, et al. (Ref. 1).
[2] Reference Amounts Customarily Consumed, 21 CFR 101.12.
[3] Quorum states that *L. fermentum* LfQi6 is not intended for use in infant formula or in any products under the jurisdiction of the United States Department of Agriculture (USDA).

beige powder. Quorum states that raw materials used are food-grade, and the production is conducted in accordance with current good manufacturing practice.

Quorum provides specifications for *L. fermentum LfQi6* that include viable cell counts ($\geq 10^{11}$ CFU/g) and limits for other microorganisms, including *Escherichia coli* (absent in 25 g), Salmonella serovars (absent in 25 g), and heavy metals, including lead (≤1.0 mg/kg). Quorum provides the analyses of three non-consecutive lots to demonstrate that the ingredient can be manufactured to conform with the provided specifications.

Quorum intends to use *L. fermentum* LfQi6 at levels providing 2 x 10^8 CFU/serving in conventional foods throughout the shelf life of that food. Quorum estimates a dietary exposure to *L. fermentum* LfQi6 of 2 x 10^9 CFU/p/d; this is based on published estimated consumption of 20 servings of food per day in the U.S. and the assumption that 8 servings of these foods as consumed would contain *L. fermentum* LfQi6 at 2x10^8 CFU/serving. The maximum estimated dietary exposure would be 8 x 10^{10} CFU/p/d, if it is assumed that there is no loss of viable organisms with processing or storage and 8 servings/d contain the ingredient at the maximum level of 10^{10} CFU/serving.

Quorum discusses published and publicly available information to support safety of *L. fermentum LfQi6*. Quorum states that *L. fermentum LfQi6* genome does not contain regions with significant homology to known toxigenic or pathogenic genes. Further, Quorum discusses published studies of evidence that *L. fermentum LfQi6* exhibits antibiotic susceptibility, does not contain plasmids capable of transmitting antibiotic resistance genes, does not show hemolytic activity, and does not produce biogenic amines. Quorum states that the fate and the safety profile of orally consumed *L. fermentum LfQi6* is like that observed after consumption of other *L. fermentum* strains. Quorum also discusses corroborative published clinical studies in infants, children, or adults consuming other *Limosilactobacillus* strains and states that no adverse effects were reported.

Based on the totality of the data and information, Quorum concludes that *L. fermentum LfQi6* is GRAS under its intended conditions of use.

Standards of Identity

In the notice, Quorum states its intention to use *L. fermentum LfQi6* in several food categories, including foods for which standards of identity exist, located in Title 21 of the CFR. 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.

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 Quorum's notice concluding that *L. fermentum LfQi6* 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 L. *fermentum* LfQi6. Accordingly, our response should not be construed to be a statement that foods containing *L. fermentum LfQi6*, if introduced or delivered for introduction into interstate commerce, would not violate section 301(ll).

Conclusions

Based on the information that Quorum provided, as well as other information available to FDA, we have no questions at this time regarding Quorum's conclusion that *L. fermentum LfQi6* is GRAS under its intended conditions of use. This letter is not an affirmation that *L. fermentum LfQi6* 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 000988 is accessible to the public at www.fda.gov/grasnoticeinventory.

Sincerely,

Susan J. Carlson -S

Digitally signed by Susan J. Carlson -S
Date: 2022.03.28 11:53:10 -04'00'

Susan Carlson, Ph.D.
Director
Division of Food Ingredients
Office of Food Additive Safety
Center for Food Safety
and Applied Nutrition

Reference

1. Zheng, J., et al. (2020). A taxonomic note on the genus Lactobacillus: Description of 23 novel genera, emended description of the genus Lactobacillus Beijerinck 1901, and union of Lactobacillaceae and Leuconostocaceae. International Journal of Systematic and Evolutionary Microbiology, 70(4), 1-77. doi: 10.1099/ijsem.0.004107