



Lillian Peterson, M.Sc.  
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CANADA

Re: GRAS Notice No. GRN 000256

Dear Ms. Peterson:

The Food and Drug Administration (FDA) is responding to the notice, dated May 20, 2008, that you submitted on behalf of Polar Foods, Inc. (Polar Foods) in accordance with the agency's proposed regulation, proposed 21 CFR 170.36 (62 FR 18938; April 17, 1997; Substances Generally Recognized as Safe (GRAS); the GRAS proposal). FDA received the notice on May 28, 2008, filed it on June 10, 2008, and designated it as GRAS Notice No. GRN 000256. On September 29, 2008, FDA received a communication from you limiting the intended use to those food categories listed in Table 1 below.

The subject of the notice is high linolenic acid flaxseed oil.<sup>1</sup> The notice informs FDA of the view of Polar Foods that high linolenic acid flaxseed oil is GRAS, through scientific procedures, for use as an ingredient in the food categories listed in Table 1.

Table 1. Food Categories and Use Levels for High Linolenic Acid Flaxseed Oil

Food Category (21 CFR 170.3(n))	Level of Use (%)
Beverages (alcoholic); beverage and beverage bases (nonalcoholic); gelatins, puddings, and fillings	0.86
Processed fruits and fruit juices; processed vegetables and vegetable juices	0.9
Grain products and pastas	3
Chewing gum; soups and soup mixes	4
Sugar, white, granulated; cereals; soft candy	6
Baked goods and baking mixes; coffee and tea; cheeses; condiments and relishes; confections and frostings; dairy product analogs; fish products; fruit and water ices; gravies and sauces; jams and jellies, commercial; milk (whole and skim); milk products; nut and nut products; plant protein products; snack foods; sweet sauces, toppings and syrups	7
Hard candy; sugar substitutes	14
Fats and oils	17

<sup>1</sup> High linolenic acid flaxseed oil has an increased level of alpha-linolenic acid compared with conventional flaxseed oil; ca. 70 % by weight vs. ca. 50% by weight.

Title 21 of the *Code of Federal Regulations, Part 101.4* (21 CFR 101.4) states that all ingredients must be declared by their common or usual name. In addition, 21 CFR 102.5 outlines general principles to use when establishing common or usual names for nonstandardized foods. Our use of "high linolenic acid flaxseed oil" in this letter should not be considered an endorsement or recommendation of that term as an appropriate common or usual name for the purpose of declaring the substance in the ingredient statement of foods that contain that ingredient. Issues associated with labeling and the appropriate common or usual name of a food are the responsibility of the Office of Nutrition, Labeling, and Dietary Supplements in the Center for Food Safety and Applied Nutrition.

As part of its notice, Polar Foods includes the report of a panel of individuals (Polar Foods' GRAS panel) who evaluated the data and information that are the basis for Polar Foods' GRAS determination. Polar Foods considers the members of its GRAS panel to be qualified by scientific training and experience to evaluate the safety of substances added to food. Polar Foods' GRAS panel critically evaluated an extensive body of peer reviewed literature regarding the safety, potential for toxicity and health effects of flaxseed oil. No evidence exists in the available information on high linolenic acid flaxseed oil that demonstrates, or suggests reasonable grounds to suspect a hazard to the public health when used at the proposed intended use levels. Based on this review, Polar Foods' GRAS Panel concluded that high linolenic acid flaxseed oil, which contains 70% alpha-linolenic acid and a low saturated fat level, is GRAS when produced in accordance with good manufacturing practice for use as a replacement for other vegetable oils under the conditions of intended use.

Polar Foods describes the identity, method of manufacture, and specifications for its high linolenic acid flaxseed oil. Polar Foods also provided information on its composition. Polar Foods obtains its oil from a flaxseed variety bred for higher levels of linolenic acid than conventional flaxseed varieties. Polar Foods compares its high linolenic acid flaxseed oil with other vegetable oils used in food and finds it is similar to other vegetable oils (such as canola, corn, olive, peanut, safflower, soybean, sunflower and walnut) and to fish oil. High linolenic acid flaxseed oil is a mixture of fatty acids, primarily in the form of triacylglycerides. The flaxseed oil is mechanically removed from the flaxseed by expeller pressing below 122°F (50°C) without the use of solvents or chemicals in the extraction process. The flaxseed oil is mechanically filter pressed to remove impurities, and is stored in bulk containers flushed with inert argon gas. The oil is produced in accordance with good manufacturing practices. Polar Foods provides the following specifications for its high linolenic acid flaxseed oil: alpha-linolenic acid (ALA) (68-73%), linoleic acid (9-12%), oleic acid (9-14%), stearic acid (2-6%), palmitic acid (3-6%), lead (not more than 0.1 mg/kg), cyanoglucosides (not more than 2 mg/kg).

Polar Foods intends high linolenic acid flaxseed oil for use as replacement for edible oils in various food categories resulting in an estimated dietary intake of less than 22 grams of high linolenic acid flaxseed oil per day (equivalent to 15 grams of ALA per day).

Polar Foods conducted a thorough literature review regarding the safety of flaxseed oil. Published studies on the effects of flaxseed oil in human and animals (rats, mice, cats, rabbits, hamsters, dogs and chimpanzees) were evaluated for safety and the occurrence of adverse effects. No

adverse effects were reported in human studies, where the diet was supplemented with flaxseed oil at levels as high as 60 grams (g) of flaxseed oil per day (d) (equivalent to 36-38 g/d of ALA). Similarly, no adverse effects from flaxseed supplementation were noted in the animal studies.

In the notice, Polar Foods discussed in detail the absorption, distribution, metabolism and excretion of flaxseed oil based on published information. The product utilizes well known and thoroughly studied physiologic pathways within the body. Because the levels of the polyunsaturated fatty acids (PUFAs) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) may increase following flaxseed oil supplementation, Polar Foods summarized published information that addresses conversion of ALA to DHA and EPA. Thus, Polar Foods addressed safety issues identified by the FDA for EPA and DHA in its affirmation of the GRAS status of menhaden oil (62 FR 30751, June 5, 1997). These issues included increased bleeding time, reduced glycemic control for diabetics, increased levels of low-density lipoprotein cholesterol among diabetics and hyperglycemics, as well as immunosuppressive effects. Polar Foods concludes that flaxseed oil supplementation would not cause an increased risk from any of the specified safety issues pertaining to EPA and DHA.

#### **Standards of Identity**

In the notice, Polar Foods states its intention to use flaxseed oil 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.

#### **Section 301(l) of the Federal Food, Drug, and Cosmetic Act (FFDCA)**

The Food and Drug Administration Amendments Act of 2007, which was signed into law on September 27, 2007, amends the FFDCA to, among other things, add section 301(l). Section 301(l) of the FFDCA prohibits the introduction or delivery for introduction into interstate commerce of any food that contains a drug approved under section 505 of the FFDCA, 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(l)(1)-(4) applies. In its review of Polar Foods notice that high linolenic acid flaxseed oil is GRAS for their intended uses, FDA did not consider whether section 301(l) or any of its exemptions apply to foods containing high linolenic acid flaxseed oil. Accordingly, this response should not be construed to be a statement that foods that contain high linolenic acid flaxseed oil, if introduced or delivered for introduction into interstate commerce, would not violate section 301(l).

#### **Conclusions**

Based on the information provided by Polar Foods, the agency has no questions at this time regarding Polar Foods' conclusion that high linolenic acid flaxseed oil is GRAS under the intended conditions of use. The agency has not, however, made its own determination regarding the GRAS status of the subject use of high linolenic acid flaxseed oil. As always, it is the

continuing responsibility of Polar Foods to ensure that food ingredients that the firm markets are safe and are otherwise in compliance with all applicable legal and regulatory requirements.

In accordance with proposed 21 CFR 170.36(f), a copy of the text of this letter responding to GRN 000256, as well as a copy of the information in this notice that conforms to the information in the proposed GRAS exemption claim (proposed 21 CFR 170.36(c) (1)), is available for public review and copying via the FDA home page at <http://www.fda.gov>. To view or obtain an electronic copy, follow the hyperlinks from the "Food" topic to the "Food Ingredients and Packaging" section to the "Generally Recognized as Safe (GRAS)" page where the GRAS Inventory is listed.

Sincerely,

~~Laura M. Tarantino, Ph.D.~~  
Director  
Office of Food Additive Safety  
Center for Food Safety  
and Applied Nutrition