Monica Banach
Regulatory and Scientific Associate
Dicentra, Inc.
603-7 St. Thomas Street
Toronto, Ontario M5S 2B7
CANADA

Re: GRAS Notice No. GRN 000805

Dear Ms. Banach:

The Food and Drug Administration (FDA, we) completed our evaluation of GRN 000805. We received the notice you submitted on behalf of Leahy Orchards, Inc. (Leahy Orchards) on July 30, 2018, and filed it on August 23, 2018. Leahy Orchards submitted an amendment to the notice on October 24, 2018, providing additional information on the composition and estimated dietary exposure of apple peel powder, and a discussion of pharmacokinetic studies on flavonoids in apple peel powder.

The subject of the notice is apple peel powder for use as an ingredient in fruits and fruit juices, vegetable juices, milk and milk products, bakery products, dairy products and substitutes, ready-to-eat cereals, sauces, dips, gravies, and condiments at levels ranging from 0.1 to 20 percent. The notice informs us of Leahy Orchards' view that these uses of apple peel powder are GRAS through scientific procedures.

Our use of the term "apple peel powder," in this letter is not our recommendation ofthat 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 non-standardized 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 "apple peel powder."

Leahy Orchards provides information about the identity and composition of apple peel powder. Leahy Orchards describes apple peel powder as a light to dark beige fine powder that may include a reddish tint. Leahy Orchards states that apple peel powder is produced from the dried peels of various cultivars of apples (*Malus domestica*). Leahy Orchards states that apple peel powder includes 20% sugars, 5% protein, 2.3% fat, and

≥3% polyphenols that include catechins, procyanidins, phloretin glycosides, chlorogenic acid, and quercetin glycosides.

Leahy Orchards describes the method of manufacture for apple peel powder. Leahy Orchards states that apple peel powder is produced using peels removed from apples during the production of apple puree. The peels are separated from the apple pulp using sieves. The peels are cooked or pre-heated using hot air, and then dried using dehydrated hot air. The dried peels are milled and sifted to obtain the final apple peel powder product.

Leahy Orchards provides specifications for apple peel powder including a minimum content of polyphenols (≥ 3%), and limits for moisture (< 7.5%), arsenic (≤ 2 milligrams per kilogram (mg/kg)), cadmium (≤ 1 mg/kg), mercury (≤ 4 mg/kg), lead (≤ 2 mg/kg), patulin (< 50 micrograms (µg)/kg), as well as limits for microorganisms. Leahy Orchards provides the results of three non-consecutive batch analyses to demonstrate that the apple peel powder can be made to meet the specifications.

Leahy Orchards provides estimates of the *per capita* dietary exposure to apple peel powder based on the maximum intended use and food consumption data from the Continuing Survey of Food Intake by Individuals (CSFII, 1994-96, 98). Leahy Orchards estimates the mean and 90th percentile dietary exposures to apple peel powder to be 8400 and 16700 mg/person/day (p/d) (equivalent to approximately 140 and 280 mg/kg body weight (bw)/d for a 60 kg individual), respectively. Leahy Orchards states that the use levels of apple peel powder are self-limiting due to its sour taste.

Leahy Orchards describes published safety data and information on polyphenols, mainly flavonoids and anthocyanins present in apple peel powder, to support the safety of apple peel powder. Leahy Orchards discusses published pharmacokinetic studies in humans on different forms of quercetins and other flavonoids present in apple peel powder. Leahy Orchards also discusses published acute and 90-day subchronic studies in rats fed diets containing apple polyphenol extract at levels up to 3.25% (3250 mg/100 g diet); no toxicologically significant adverse effects were observed in these studies. Citing results from published *in vitro* and *in vivo* genotoxicity studies, Leahy Orchards concludes that apple peel powder is neither mutagenic nor genotoxic. Moreover, Leahy Orchards describes published human clinical efficacy studies in which subjects consumed apple polyphenol extracts at levels up to 900 mg/d (equivalent to 15 mg/kg bw/d) for 8 weeks or apple peel powder at 400 mg/kg bw/d for 12 weeks in which no adverse effects were observed. To further support the safety of apple peel powder, Leahy Orchards describes the long history of safe consumption of apples world-wide.

Based on the information presented in the notice, Leahy Orchards concludes that apple peel powder is GRAS for its intended use in food.

Standards of Identity

In the notice, Leahy Orchards states its intention to use apple peel powder 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 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). The notice raises a potential issue under these labeling provisions. Leahy Orchards describes apple peel powder as having certain health benefits. If products containing apple peel powder 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, Leahy Orchards notes that apple peel powder may include a reddish tint. As such, the use of apple peel powder 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 000805 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 Petition Review in OFAS.

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 Leahy Orchards' notice concluding that apple peel powder 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 apple peel powder. Accordingly, our response should not be construed to be a statement

that foods containing apple peel powder, if introduced or delivered for introduction into interstate commerce, would not violate section 301(ll).

Conclusions

Based on the information that Leahy Orchards provided, as well as other information available to FDA, we have no questions at this time regarding Leahy Orchards' conclusion that apple peel powder is GRAS under its intended conditions of use. This letter is not an affirmation that apple peel powder 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 000805 is accessible to the public at www.fda.gov/grasnoticeinventory.

Sincerely,

Michael A. Adams -S

Digitally signed by Michael A. Adams -S
Date: 2019.03.08 09:56:41 -05'00'

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