GR

Original Submission

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DANISCO CULTOR

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RECEIVED
APR 30 2002
OFFICE OF
FOOD ADDITIVE SAFETY

April 29, 2002

Dr Linda Kahl, DBGNR
Office of Food Additive Safety, HFS-255
Center for Food Safety and Applied Nutrition
Food and Drug Administration
5100 Paint Branch Parkway
College Park, MD 20740

Dear Dr Kahl:

Danisco Cultor USA (DCA) hereby submits for your consideration five (5) copies of a GRAS Notification for new use categories for polydextrose, in accordance with the FDA guidance document "How to Submit a GRAS Notice."

Polydextrose is an approved food additive for use in several food categories under 21 CFR 172.841. DCA has determined by scientific principles that use of polydextrose in several additional categories is GRAS according to the criteria in 21 CFR 170.30. As you know, there are many substances in the CFR that are approved food additives for some uses and GRAS for others. A partial list of these is attached.

Appended hereto is the required information listing the use categories, use levels in each, estimated daily intake for all uses, summary of safety studies and the basis for our determination. Supporting information is referenced and available to FDA upon request.

Please don't hesitate to contact me if you need additional information. We look forward to hearing from you soon.

Sincerely,

M. H. Auerbach

DANISCO
Sweeteners

GRAS Notification - Polydextrose New Uses

I. The undersigned, Danisco Cultor America, hereby claims that the use of polydextrose as an ingredient in several food categories (section I C below), in addition to those listed in 21 CFR 172.841, is exempt from the premarket approval requirements of the Federal Food, Drug and Cosmetic Act because we have determined that such use is GRAS.

A. Name and address of notifier

Danisco Cultor America
440 Saw Mill River Road
Ardsley, NY 10502-2605

Contact: Michael H. Auerbach, PhD, Director
Scientific Services, Regulatory Affairs
800-255-6837 x2506

B. **Common or usual name of the notified substance:** Polydextrose (referred to herein as PDX)

C. Applicable conditions of use of the notified substance

The additional uses of polydextrose, for which we have determined use therein is GRAS, are described below, with the function and typical and maximum use levels in each category.

1. Non-Sweet Baked Goods - PDX would be used to replace part of the sugars and some of the fat while maintaining a pleasant texture and mouthfeel of breads, rolls, crackers, flour tortillas, pita bread, pizza crust, and English muffins. It would function primarily as a humectant and water binding ingredient to help slow down the effects of undesirable changes in the moisture content and hence prolong the shelf life of these products. PDX would be used in these products at a typical level of 4% and a maximum level of 6%, above which the processing and handling, texture and flavor are adversely affected.

2. Breading and Batter Coatings - PDX would be used as a texturizing agent to improve crispness and crunchiness of batter-coated fried foods. It would be used in these products at a typical level of 2% and a maximum level of 3%, above which the texture and appearance are adversely affected.

3. Flavor Bits on Crackers – PDX would be used as a part of the savory bits coated onto flavored crackers. PDX would make up typically 30% of the flavor bits, with a maximum level of 50%. When the bits are applied to the crackers at a use level of 7%, the amount of PDX in the crackers becomes 2.1% typically, with a maximum of 3.5%. A higher use level in the bits would reduce flavor impact.

4. Snack Chips (corn, potato, rice and pretzels) – PDX would be used as a component of flavored coatings for corn, potato and rice-based snack chips and pretzels at a typical level in the snacks of 7-11% and a maximum level of 10-14%. Higher use levels would adversely affect the flavor and texture of the chip.

5. RTE Breakfast Cereals - PDX would be used as a texturizing agent to prolong crunchiness and improve adhesion of flavor and other food additives to breakfast cereals. It also functions as a binder and extrusion aid, as it helps keep the intended shape and enhance the release properties during the forming process of extruded breakfast cereals. It would be used in these products at a typical level of 9% and a maximum level of 16.7%, above which processing, texture, and flavor are adversely affected.

6. Surimi (Minced Fish and Meat)- PDX would be used to replace nutritive sweeteners or polyols in surimi and other comminuted fish and meat products such as chicken fingers, salmon patties, etc. It is an effective cryoprotectant, which unlike sorbitol or corn syrup does not add sweetness to the product. The typical and maximum use level is 8.0%, above which it would have adverse effects on the texture and taste of these products.

7. RTD Nutritional Beverages- PDX would be used to replace sugars and/or fat in these products as a low calorie bulking agent to improve creaminess and mouthfeel. The typical and maximum use level is 8.0%, above which PDX would have adverse effects on the texture, taste and cost.

8. Non-Carbonated Beverages and Dry Beverage Mixes (excluding fluid milk, standard of identity fruit juices, and dry coffee mixes) - PDX would be used to replace sugars in these products. As a low calorie bulking agent, it improves mouthfeel and creaminess. The typical use level is 5 g/serving, with a maximum use level of 5%, above which PDX would have adverse effects on the texture, taste and cost.

Polydextrose used in categories 7 and 8 above would be consumed typically by adults seeking to reduce their intake of sugars and/or calories. In the other categories listed it could potentially be consumed by all members of the population.

D. **Basis for the GRAS determination**: scientific procedures

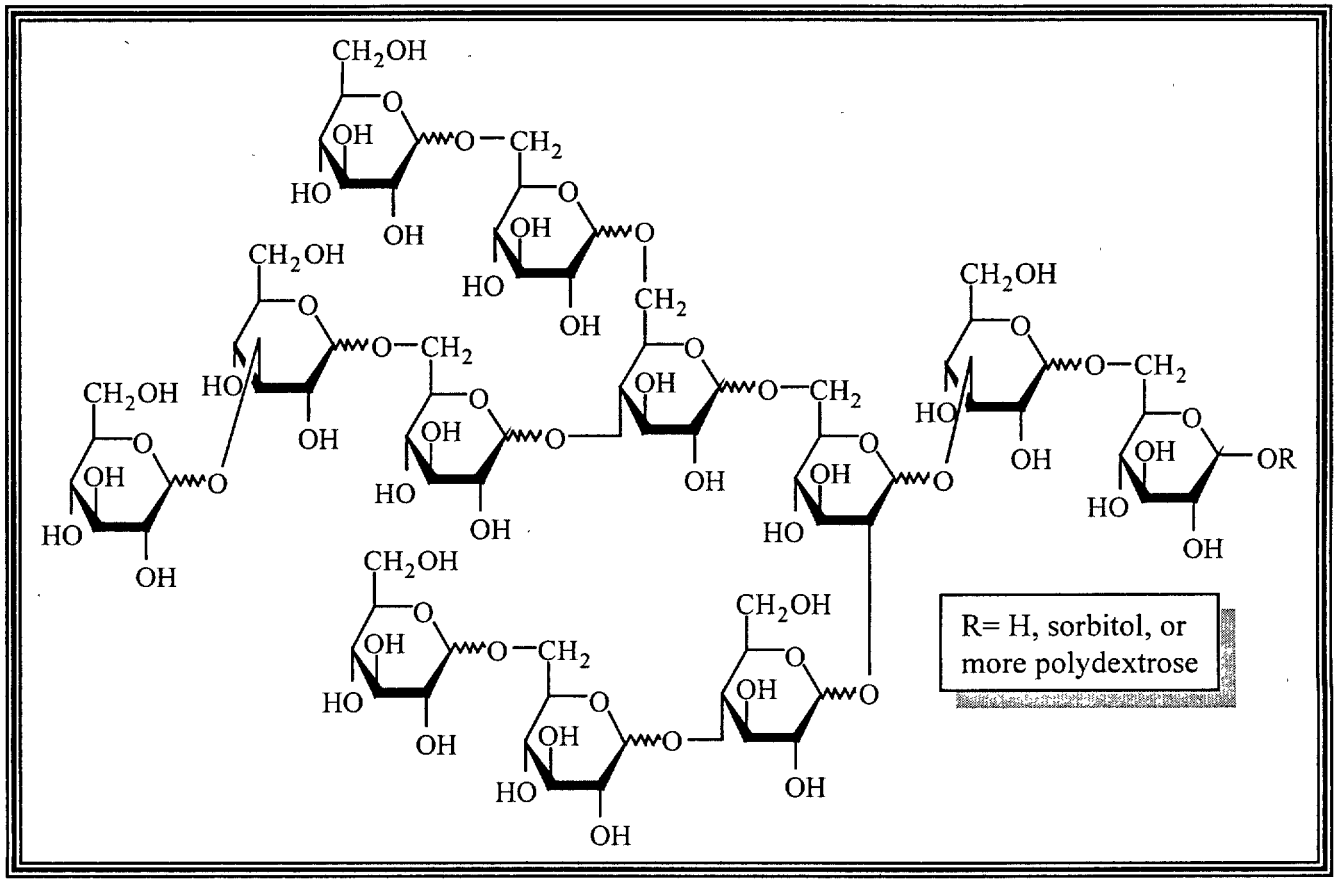
E. DCA hereby states that the data and more detailed information that are the basis for our GRAS determination are available for FDA's review and will be provided upon request. This information is summarized and described below.

II. Identity of polydextrose.

Polydextrose is a synthetic, water-soluble low-calorie carbohydrate polymer prepared by the bulk melt polycondensation of glucose and sorbitol (~9:1 ratio) *in vacuo* in the presence of catalytic amounts of citric or phosphoric acids. The commercial product also contains a few percent of moisture and the residual free monomers glucose and sorbitol, along with a small amount of anhydroglucose (levoglucosan). It is used primarily as a bulking agent, humectant and texturizer in reduced calorie foods.

PDX has a weight average molecular weight (Mw) of ~2000 and average degree of polymerization (DP) of ~12. All possible glycosidic linkages with the anomeric carbon of glucose are present, including α- and β1-2, 1-3, 1-4 and 1-6, with some branching; the 1-6 linkage predominates. As a result, PDX is resistant to the action of enzymes of the upper digestive tract so that the majority of ingested polydextrose passes into the colon, where approximately half is fermented by the intestinal flora while half is excreted with the feces. Metabolically, PDX belongs to the group of natural and synthetic partially digestible carbohydrates which includes lactulose, resistant starches, oligosaccharides, and some soluble fiber isolates (e.g. plant gums). All these substances cause similar gastrointestinal effects if consumed in excessive amounts.

PDX is regulated as a food additive under 21 CFR 172.841. It has been manufactured in the US and sold in the US and 56 other countries for up to 20 years. Details of the manufacturing process are given in the original food additive petition (9A3441 – 4/17/79; 44 FR 22816). Product specifications are given in the Food Chemicals Codex, 4th edition 2nd supplement (attached). Analytical results for five non-consecutive production batches vs specifications are also attached. The CAS number is 68424-04-4. PDX is a white to off-white powder that is soluble in water up to about 80% solids. The typical structure is shown below.



III. Self-limiting levels of use.

As described in Section I C above, use of PDX in the food categories listed above the stated maximum level results in reduced quality and increased cost of the product. Such use would therefore be functionally and commercially disadvantageous and therefore not likely to occur.

IV. Detailed summary of the basis for the GRAS determination

A. Establishment of the safety of polydextrose and its probable consumption

1. Animal studies

Studies in rodent and non-rodent species included acute, subchronic, chronic, reproduction and development, biodisposition and genetic toxicity studies. PDX when administered in the diet is poorly absorbed, not metabolized, but partially degraded by colonic bacteria to carbon dioxide, volatile fatty acids and related compounds. The lack of absorption and resistance to metabolism results in movement of water into the GI tract (osmotic effect) and results in dose-dependent stool softening. At extremely high doses (50% of the diet), watery diarrhea was observed in dogs. K_2CO_3-neutralized PDX in dogs at these dose levels created an electrolyte imbalance to the extent that serum calcium levels were significantly increased, resulting in high urinary calcium levels and nephrocalcinosis. This effect was attributed entirely to the extremely high potassium intake and not to the PDX polymer itself. This did not occur with unneutralized PDX or in the absence of chronic watery diarrhea. (Potassium-neutralized PDX is not currently commercially produced).

Polydextrose is not carcinogenic, mutagenic, teratogenic, and exhibited no toxicity in reproduction studies. The effects observed in animals were limited to the GI tract. A report of the animal studies is publicly available in the detailed critical evaluation by Flamm and Burdock of 1999 (1). They concluded (ibid, p 263): "The conclusions relevant to this work are that omnivores such as rats, mice and monkeys are relatively refractory to the effects of polydextrose with a no-effect level for systemic toxicity at 2500 to 10,000 mg/kg body weight/day."

The only effect reported in humans was dose-dependent stool softening at high intakes, as noted below.

2. Human Studies - Gastrointestinal Toleration

The gastrointestinal toleration of humans to high oral doses of polydextrose has been determined in 7 clinical studies. Five of these studies were reported to FDA in the original food additive petition. Two more studies were conducted after the filing of the FAP. At PDX doses where side effects were observed, the number of effects for PDX was the same as for the placebo/control in many cases. These studies demonstrated that a daily consumption of 50 g, even if consumed as a single dose, is unlikely to cause gastrointestinal effects, except in particularly sensitive persons and in young children. It was also found that polydextrose is significantly better tolerated than sorbitol.

From a study in which adult participants received polydextrose in amounts of up to 130 g/day (2.2 g/kg bw), a mean laxative threshold of 90 g/day (1.5 g/kg) was determined. The mean laxative threshold is defined as the daily dose that would cause a laxative effect in half the consuming population.* In a study with children in 5 age groups with increasing doses from 5 to 55 g/day, corresponding to ~0.5-1.0 g/kgbw, the mean laxative threshold was estimated to be above the highest dose tested in each age group, or 1.0 g/kgbw.

These studies demonstrated that PDX laxation threshold is comparable in adults and children on a body weight basis.

Single dose laxation threshold	Adults	Children (4-6 yrs)
g/day	50	20
g/kg bw/day	0.83	1.0

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* In the 1987 report of its 31st meeting, JECFA stated, "Studies in man have demonstrated that polydextroses, when administered at very high doses, exert a laxative effect, with a mean laxative threshold of 90 g per day or 50 g as a single dose."

Numerous additional studies have been published on the gastrointestinal effects of PDX consumption with regard to its functions as a dietary fiber (2-19).

Regarding "pharmacologically related substances in the diet," numerous studies have been reported in the literature comparing the laxation potential of various poorly digested carbohydrates and sugar alcohols. Although these studies were conducted at different laboratories under a range of conditions, the table below summarizes the comparative values from 56 publications (Calorie Control Council; list available on request).

LAXATION THRESHOLDS OF VARIOUS CARBOHYDRATES

SUBSTANCE	SINGLE DOSE (g)*	DAILY DOSE (g)*
Mannitol	10	20
Inulin/FOS	20	30
Lactitol	25	70
Sorbitol	30	70
Xylitol	35	70
Isomalt	40	50
Maltitol	40	50
Lycasin 80/55	40	80
Erythritol	48	>90
Polydextrose	**50**	**90**
Fructose	70	>90

* Single Dose = the single dose at which the first subject would experience laxation
Daily Dose = the average daily intake at which half of the subjects would experience laxation

Accordingly, the only significant potential concern about broader use of PDX in additional food categories would be the potential for laxation symptoms arising from increased daily intake.

3. Estimated Exposure - Polydextrose

Daily intake of polydextrose was estimated by FDA in 1992 during the course of its evaluation of Pfizer's food additive petition (FAP 2A4332) for the use of PDX in table spreads (Michael DiNovi to J. Wallwork, 3/30/92; copy attached).

Estimated daily intake of PDX from currently approved and proposed new uses was recently determined by Novigen Sciences Inc. from the 1994-96 USDA Continuing Survey of Food Intakes by Individuals (CSFII) using their FARE™ software. These estimates assume polydextrose is consumed in all foods in which it is approved, a highly unlikely scenario. The results are summarized below:

	3-day average per user g/person/day for total population age 2+			
	Typical Use Levels		Maximum Use Levels	
	Mean	90th %ile	Mean	90th %ile
Total Current Uses (21 CFR 172.841)	8.6	19.3	18.2	39.7
Total Current and Proposed Uses	16.3	32.1	31.5	61.6

For all current and proposed new uses of polydextrose at their maximum projected use level, the mean intake of users is still well below the experimentally determined mean laxative threshold (90 g/day).

4. **Estimated Exposure – Sorbitol**

Polydextrose contains up to 2% residual sorbitol, and thus represents a minor source of dietary sorbitol. Based on the above table, we also estimated the contribution of sorbitol to the diet from polydextrose use.

	3-day average per user g/person/day for total population age 2+			
	Typical Use Levels		Maximum Use Levels	
	Mean	90th %ile	Mean	90th %ile
Total Current Uses	0.17	0.39	0.36	0.79
Total Current and Proposed Uses	0.33	0.64	0.63	1.23

This is compared to the estimated daily intake of sorbitol from all sources of 7.5-8.5 g/person/day (see attachment). Sorbitol from polydextrose would represent less than 10% of total daily sorbitol intake. For comparison purposes, the mean exposure at maximum use level in all current and proposed uses - 0.63 g - represents less than the amount of sorbitol in one stick of sugarless chewing gum (1.2-1.5 g sorbitol).

Accordingly, these data indicate that the total daily intake of polydextrose and sorbitol from both the currently approved uses and the proposed new uses will not approach or exceed the experimentally determined mean laxative threshold of polydextrose.

B. Information that may appear to be inconsistent with the GRAS determination

We are not aware of any such reports or information.

C. Basis for concluding there is consensus among qualified experts that PDX is GRAS under the intended conditions of use

1. Experts from JECFA and the EC SCF evaluated the safety of PDX in 1987 and 1990, respectively, and granted it an ADI of "not specified."

2. A separate panel of scientists qualified by training and experience was assembled by Danisco Cultor in April 2002 to assess the potential GRAS status for the proposed new uses of PDX. Resumes of the panel members are available upon request. The panel consisted of:
   - Dr. Joseph Borzelleca, Professor Emeritus, Virginia Medical College; Chairman
   - Dr. Herbert Blumenthal, retired FDA CFSAN Director of Toxicology; Consultant
   - Dr. Joseph Hotchkiss, Professor of Food Science, Cornell University

   The panel was provided with a search of the scientific literature, dietary exposure data, summaries of animal and human safety studies and JECFA review documents. They independently and critically evaluated these documents and other materials deemed appropriate, and concluded that the use of PDX for the additional food categories listed above was GRAS. Their report is also attached.

V. References

1. Burdock GA, Flamm WG. 1999. A review of the studies of the safety of Polydextrose in food, Food Chem. Toxicol., 37(2/3):233-264
2. Tomlin J, Read NW. 1988. A comparative study of the effect on colon function by feeding isphagula husk and polydextrose. *Aliment. Pharmacol.Therap.* 2:513-9
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9. Wang X., Gibson GR. 1993. Effects of the in vitro fermentation of oligofructose and inulin by bacteria growing in the human large intestine. *J. Appl. Bacteriol.* 75:373-80
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13. Harada E, Hashimoto Y, Syuto B. 1995. Polydextrose induces precocious cessation of intestinal macromolecular transmission and development of digestive enzymes in the suckling rat. *Comp. Biochem. Physiol.* 111A:479-85
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15. Hara H, Suzuki T, Aoyama Y. 2000. Ingestion of the soluble dietary fibre, polydextrose, increases calcium absorption and bone mineralization in normal and total-gastrectomized rats. *Brit. J. Nutr.* 84:655-61.
16. Hamanaka M. 1987. Polydextrose as a water-soluble dietary fiber. *Syokuhin Kogyo* 73-80 (September)
17. Craig SAS, Holden JF, Troup JP, Auerbach MH, Frier HI. 1998. Polydextrose as soluble fiber: physiological and analytical aspects. *Cereal Foods World* 43:370-6
18. Craig SAS, Holden JF, Troup JP, Auerbach MH, Frier HI. 1999. Polydextrose as soluble fiber and complex carbohydrate, Ch. 18 in: Complex Carbohydrates in Foods, SS Cho, L Prosky and M Dreher, eds., Marcel Dekker, Inc., New York
19. Zhong J, Luo B, Xiang M, Liu H, Zhai Z, Wang T, Craig SAS. 2000. Studies on the effects of polydextrose on physiological function in Chinese people. *Am. J. Clin. Nutr.* 72:1503-9.

VI. Attachments

1. List of approved food additives that are also GRAS
2. Food Chemicals Codex specification monograph for polydextrose
3. Analytical results for five production batches of polydextrose
4. FDA polydextrose intake estimate (M. DiNovi to J. Wallwork 3/30/92)
5. Estimated daily intake of sorbitol
6. Report of April 2002 expert panel
7. Reference 1

Substances Regulated Both as Direct Food Additives and GRAS Substances

Substance	GRAS Regulation	Food Additive Regulation
Acetic acid	182.1: GRAS as vinegar 184.1005: curing agent, flavor enhancer, pH control agent, solvent, etc.	172.814: processing aid in hydroxylated lecithin mfr
Acetone	182.99: pesticide adjuvant	173.210: extraction solvent for spice oleoresins
Algae, brown	184.1120: flavor enhancer & adjuvant	172.365: nutrient supplement for iodine
BHA	182.3169: antioxidant (AO) in fats & oils	172.515: AO in flavoring substances 172.615: AO in gum 172.110: AO in potato granules/flakes/shreds, dry yeasts, beverages, breakfast cereals, glazed fruits 173.340: AO in defoamers
BHT	182.3173: AO in fats & oils	172.115: AO in potato shreds, breakfast cereals 172.615: AO in gum 173.340: AO in defoamers
Calcium chloride	184.1193: anticaking agent, flavor enhancer, humectant, nutrient supplement, processing aid, etc.	172.560: processing aid in modified hop extracts
Calcium Silicate	182.2227: use in table salt, baking powder	172.410: use in baking powder & anticaking agent in food, in general
Calcium Stearate	184.1229: flavoring agent & adjuvant, lubricant, stabilizer & thickener	172.863: binder, emulsifier, anticaking agent in food, in general
Caprylic acid	184.1025: flavoring agent	172.860: (fatty acids) lubricant, binder, defoamer
Carboxymethyl Cellulose, Na salt	182.70: migrating from cotton food packaging 182.1745: GRAS at GMP	173.310: boiler water additive
Cocoa butter Substitute	184.1259: (from palm oil) use in confections, soft candy coatings, sweet sauces & toppings	172.861: coating for sugar, table salt, vitamins, citric acid, succinic acid and spice; compound coatings, cocoa-based candies
Ethyl Cellulose	182.90: migrant from paperboard	172.868: binder for vitamin pills
Ferrous fumarate	184.1307d: nutrient supplement	172.350: source of iron
l-Glutamic acid	182.1045: GRAS at GMP	172.320: dietary amino acid
Glutamic acid HCl	182.1047: GRAS at GMP	172.320: dietary amino acid
Mg Stearate	184.1440: lubricant/release agent	172.863: binder, emulsifier, anticaking agent
d,l-Menthol	182.20: natural flavoring extract	172.515: synthetic flavoring substance
d,l-Menthyl acetate	182.20: natural flavoring extract	172.515: synthetic flavoring substance
Methyl paraben	184.1490: antimicrobial agent	172.515: synthetic flavoring substance
Oleic acid	182.70: migrating from cotton packaging 182.90: migrating from paperboard	172.210: coating on fresh citrus fruit 172.860: (fatty acids) lubricant, binder, defoamer
Potassium iodide	184.1634: source of iodine in table salt	172.375: source of essential iodine

Propyl gallate	184.1660: antioxidant in food at GMP	172.615: antioxidant in chewing gum base
Propyl paraben	184.1670: antimicrobial agent	172.515: synthetic flavoring substance
Silicon dioxide	182.90: migrating from paperboard	172.480: anticaking agent
Sodium alginate	184.1724: stabilizer, thickener, emulsifier	173.310: boiler water additive
Sodium meta-PO4	182.6769: general food use	172.892: use in food starch-modified mfr
Stearic acid	184.1090: flavoring agent & adjuvant in foods, in general	172.860: lubricant, binder, defoaming agent 172.210: coating on fresh citrus fruit 172.615: masticant in chewing gum base

M. H. Auerbach – 4/19/02

PAGES 000013-000017 HAVE BEEN REMOVED IN ACCORDANCE WITH COPYRIGHT LAWS
PLEASE SEE APPENDED BIBLIOGRAPHY FOR A LIST OF THE REFERENCES THAT
HAVE BEEN REMOVED FROM THIS REQUEST

Danisco Cultor America, Inc.
PO Box 8266
Terre Haute IN 47808

DANISCO Sweeteners

3

Certificate of Analysis

Litesse® Powder - 25 Kg Bag

Material 104705
Lot number V18010S

Characteristic	Lower Limit	Upper Limit	Value	Unit
Appear-White to cream powder	-	-	Passes Test	
Odorless	-	-	Passes Test	
FCC Identification Test	-	-	Passes Test	
Polydextrose Assay *	90.0	-	97.2	%
Anhydro-D-Glucoses (Levogluc)*	-	4.0	3.1	%
Glucose *	-	4.0	2.7	%
Sorbitol *	-	2.0	1.8	%
Water Content	-	4.0	0.4	%
High Molecular Wt. Limit	-	-	Passes Test	
5-Hydroxymethylfurfural *	-	0.10	0.03	%
Lead (0.5 ppm Maximum)	-	-	Passes Test	
Heavy Metals (5 ppm Maximum)	-	-	Passes Test	
pH (10% Solution)	3.0	4.5	3.4	pH
Residue on Ignition	-	0.30	0.00	%
Acidity, Anhydr. Basis (meq/g)	-	0.030	0.015	meq
Standard Plate Count - Aerobic	-	10	0	cfg
Yeast and Mold	-	10	0	cfg
Salmonella - Negative to test	-	-	Passes Test	
E.Coli - Negative to test	-	-	Passes Test	
Staph aureus Negative to test	-	-	Passes Test	

* Anhydrous, ash-free basis
Storage - Avoid excessive heat and humidity

This product has been evaluated by Quality Control and is released for use. It complies with the FCC IV monograph and is manufactured under a quality management system certified as compliant with the requirements of ISO 9002:1994.

This certificate is electronically generated, thereby not requiring a signature.

A. P. Gossmann, Quality Manager

000017.001

08/13/2001

Danisco Cultor America, Inc.
PO Box 8266
Terre Haute IN 47808

DANISCO Sweeteners

Certificate of Analysis

Litesse® Powder - 25 Kg Bag

Material 104705
Lot number V19100S

Page 1 of 1

Characteristic	Lower Limit	Upper Limit	Value	Unit
Appear-White to cream powder	-	-	Passes Test	
Odorless	-	-	Passes Test	
FCC Identification Test	-	-	Passes Test	
Polydextrose Assay *	90.0	-	93.9	%
Anhydro-D-Glucoses (Levogluc)*	-	4.0	2.5	%
Glucose *	-	4.0	3.1	%
Sorbitol *	-	2.0	1.6	%
Water Content	-	4.0	0.5	%
High Molecular Wt. Limit	-	-	Passes Test	
5-Hydroxymethylfurfural *	-	0.10	0.03	%
Lead (0.5 ppm Maximum)	-	-	Passes Test	
Heavy Metals (5 ppm Maximum)	-	-	Passes Test	
pH (10% Solution)	3.0	4.5	3.3	pH
Residue on Ignition	-	0.30	0.00	%
Acidity, Anhydr. Basis (meq/g)	-	0.030	0.018	meq
Standard Plate Count - Aerobic	-	10	0	cfg
Yeast and Mold	-	10	0	cfg
Salmonella - Negative to test	-	-	Passes Test	
E.Coli - Negative to test	-	-	Passes Test	
Staph aureus Negative to test	-	-	Passes Test	

* Anhydrous, ash-free basis
Storage - Avoid excessive heat and humidity.

This product has been evaluated by Quality Control and is released for use. It complies with the FCC IV monograph and is manufactured under a quality management system certified as compliant with the requirements of ISO 9002:1994.

This certificate is electronically generated, thereby not requiring a signature.

A. F. Gossmann, Quality Manager

000018

09/24/2001

Danisco Cultor America, Inc.
PO Box 8266
Terre Haute IN 47808

DANISCO Sweeteners

Certificate of Analysis

Litesse® Powder - 25 Kg Bag

Material 104705
Lot number V1X020I

Page 1 of 1

Characteristic	Lower Limit	Upper Limit	Value	Unit
Appear-White to cream powder	-	-	Passes Test	
Odorless	-	-	Passes Test	
FCC Identification Test	-	-	Passes Test	
Polydextrose Assay *	90.0	-	94.7	%
Anhydro-D-Glucoses (Levogluc)*	-	4.0	2.2	%
Glucose *	-	4.0	3.2	%
Sorbitol *	-	2.0	1.5	%
Water Content	-	4.0	0.5	%
High Molecular Wt. Limit	-	-	Passes Test	
5-Hydroxymethylfurfural *	-	0.10	0.03	%
Lead (0.5 ppm Maximum)	-	-	Passes Test	
Heavy Metals (5 ppm Maximum)	-	-	Passes Test	
pH (10% Solution)	3.0	4.5	3.5	pH
Residue on Ignition	-	0.30	0.04	%
Acidity, Anhydr. Basis (meq/g)	-	0.030	0.017	meq
Standard Plate Count - Aerobic	-	10	2	cfg
Yeast and Mold	-	10	0	cfg
Salmonella - Negative to test	-	-	Passes Test	
E.Coli - Negative to test	-	-	Passes Test	
Staph aureus Negative to test	-	-	Passes Test	

* Anhydrous, ash-free basis
Storage - Avoid excessive heat and humidity.

This product has been evaluated by Quality Control and is released for use. It complies with the FCC IV monograph and is manufactured under a quality management system certified as compliant with the requirements of ISO 9002:1994.

This certificate is electronically generated, thereby not requiring a signature.

A. F. Gossmann, Quality Manager

000019

11/13/2001

Danisco Cultor America, Inc.
PO Box 8266
Terre Haute IN 47808

DANISCO Sweeteners

Certificate of Analysis

Litesse® Powder - 25 Kg Bag

Material 104705
Lot number V1X290I

Characteristic	Lower Limit	Upper Limit	Value	Units
Appear-White to cream powder	-	-	Passes Test	
Odorless	-	-	Passes Test	
FCC Identification Test	-	-	Passes Test	
Polydextrose Assay *	90.0	-	95.4	%
Anhydro-D-Glucoses (Levogluc)*	-	4.0	2.5	%
Glucose *	-	4.0	3.4	%
Sorbitol *	-	2.0	1.7	%
Water Content	-	4.0	0.6	%
High Molecular Wt. Limit	-	-	Passes Test	
5-Hydroxymethylfurfural *	-	0.10	0.03	%
Lead (0.5 ppm Maximum)	-	-	Passes Test	
Heavy Metals (5 ppm Maximum)	-	-	Passes Test	
pH (10% Solution)	3.0	4.5	3.5	pH
Residue on Ignition	-	0.30	0.06	%
Acidity, Anhydr. Basis (meq/g)	-	0.030	0.015	meq
Standard Plate Count - Aerobic	-	10	0	cfg
Yeast and Mold	-	10	3	cfg
Salmonella - Negative to test	-	-	Passes Test	
E.Coli - Negative to test	-	-	Passes Test	
Staph aureus Negative to test	-	-	Passes Test	

* Anhydrous, ash-free basis
Storage - Avoid excessive heat and humidity.

This product has been evaluated by Quality Control and is released for use. It complies with the FCC IV Monograph and is manufactured under a quality management system certified as compliant with the requirements of ISO 9002:1994.

This certificate is electronically generated, thereby not requiring a signature.

A. F. Gossmann, Quality Manager

000020

12/10/2001

Danisco Cultor America, Inc.
PO Box 8266
Terre Haute IN 47808

DANISCO Sweeteners

Certificate of Analysis

Litesse® Powder - 25 Kg Bag

Material 104705
Lot number V22060S

Page 1 of 1

Characteristic	Lower Limit	Upper Limit	Value	Unit
Appear-White to cream powder	-	-	Passes Test	
Odorless	-	-	Passes Test	
FCC Identification Test	-	-	Passes Test	
Polydextrose Assay *	90.0	-	95.7	%
Anhydro-D-Glucoses (Levoglue)*	-	4.0	2.6	%
Glucose *	-	4.0	3.0	%
Sorbitol *	-	2.0	1.7	%
Water Content	-	4.0	0.5	%
High Molecular Wt. Limit	-	-	Passes Test	
5-Hydroxymethylfurfural *	-	0.10	0.03	%
Lead (0.5 ppm Maximum)	-	-	Passes Test	
Heavy Metals (5 ppm Maximum)	-	-	Passes Test	
pH (10% Solution)	3.0	4.5	3.3	pH
Residue on Ignition	-	0.30	0.00	%
Acidity, Anhydr. Basis (meq/g)	-	0.030	0.019	meq
Standard Plate Count - Aerobic	-	10	0	cfg
Salmonella - Negative to test	-	-	Passes Test	
E.Coli - Negative to test	-	-	Passes Test	
Staph aureus Negative to test	-	-	Passes Test	

* Anhydrous, ash-free basis
Storage - Avoid excessive heat and humidity.

This product has been evaluated by Quality Control and is released for use. It complies with the FCC IV monograph and is manufactured under a quality management system certified as compliant with the requirements of ISO 9002:1994.

This certificate is electronically generated, thereby not requiring a signature.

A. F. Gossmann, Quality Manager

000021

02/26/2002

IV. B

(4)

Memorandum

Date: September 30, 1992

From: Food and Color Additives Review Section, HFF-415

Subject: FAP 2A4332 (MATS #658): Pfizer Inc. Polydextrose as a Bulking Agent/Texturizer in Tablespreads. Submission of 6-22-92.

To: Direct Additives Branch, HFF-334
Attn: J. Wallwork

Pfizer is petitioning to amend 21 CFR 172.841 to allow the use of polydextrose (PDX) as a texturizer/bulking agent in tablespreads. PDX is currently regulated for use as a bulking agent, formulation aid, humectant, and texturizer in a number of foods. Petitions are pending for additional uses (FAP's 7A3998, 8A4068, 9A4126, and 1A4258). Pfizer has incorporated by reference the information in these petitions concerning identity, manufacture, food-grade specifications, and studies supporting the safety of PDX. In this review, we shall comment on the intended technical effects, the estimate of daily intake for PDX from its currently approved and proposed uses, and the analytical methodology used to quantify PDX in tablespreads.

Intended Technical Effect

Pfizer has submitted an outline of a hedonic testing study to substantiate its claim that PDX accomplishes its intended technical effect. A spread containing 8.5% PDX was prepared, and its characteristics were evaluated by a panel. The results suggest that the PDX product was similar in taste and appearance to a non-PDX control spread.

Pfizer has not submitted evidence that the use of PDX in tablespreads is technologically self limiting, nor have they proposed a regulatory limit (they state that PDX would be used between 5 and 12%, with a usual use level of 8.5%. If Pfizer wishes to have PDX regulated with use restricted only by GMP, it will be necessary for them to submit information concerning the self-limiting level in spreads.

Food Grade Specifications

Pfizer is requesting that §172.841 be amended to adopt the Food Chemicals Codex Monograph for PDX (3rd Edition, 2nd and 3rd Supplements, 1986 and 1992). Because Pfizer is the sole source for PDX at this time, and the FCC monograph was subjected to Federal Register notice and comment procedures, we concur with this proposed amendment.

Estimate of Daily Intake (EDI)

The EDI for PDX was originally prepared for FAP 9A3441. It was updated in a review memorandum for FAP's 7A3998 and 8A4068 (10-3-88, Adams). In the reviews for FAP's 9A4126 and 1A4258, incremental intakes were added to those in the updated EDI. In this review, we have again updated the EDI for PDX using the MRCA 5-year menu census (1982-87) with 1987-88 USDA portion sizes. Table 1 shows the updated EDI for PDX from its currently regulated uses. Table 2 includes all of the proposed uses for PDX. Table 3 contains the report of the results from the Monte Carlo simulations used in this review. Tables 4 and 5 list the inputs used in the Mont Carlo simulations.

The EDI's were obtained using a Monte Carlo analysis[1]. For each food subcategory, values sampled from its lognormal food intake distribution were multiplied by those from a triangular distribution describing the minimum, typical, and maximum use levels and a toggle describing the eater/non-eater ratio (a value of 0 is used for non-eaters, 1 for eaters. This toggle converts the eaters-only intakes in the survey to total sample intakes whose means can be summed). The individual food subcategory PDX mean intakes are summed and a distribution of exposures is prepared by the software package. The 90th percentile intakes are taken from the prepared distributions. We have assumed that all food products that can contain PDX do, and that the consumer's choices of individual foods are unaffected by the presence of PDX. We have determined that correlation of pairs of foods, such as peanut butter and jelly, does not affect the outcome of the simulation.

The updated mean PDX exposure (see Table 1) from its currently regulated uses is 14 grams per person per day (g/p/d) for the 2+ years age group and 12 g/p/d for the 2-5 year old subgroup. The corresponding 90th percentile exposures are 25 and 21 g/p/d (see top of Table 3). Including all of the proposed uses (see Table 2), the mean exposures are 18 g/p/d for the 2+ year olds and 17 g/p/d for the 2-5 year old. The corresponding 90th percentile exposures are 30 and 26 g/p/d (see bottom of Table 3). Because of the varied uses for PDX, the percentage of eaters of PDX is practically 100%. Therefore eaters-only and total sample exposures are identical.

We note that these estimates are lower than those previously prepared for PDX. This is primarily due to the use of a triangular distribution of use levels for PDX in foods, overall reduction in the intake of foods containing PDX (Use of 1987-88 USDA portion sizes), and the elimination of the consideration of PDX use in granulated white sugar (this category had previously been included in our exposure estimates; PDX will not be used in this food). The zeros in the tables are the result of rounding the individual category estimates to one decimal place.

Analytical Methodology

Pfizer has submitted a method for quantifying PDX levels in tablespreads. PDX is extracted from the spreads (and spiked spread samples) with water. A carbohydrase is used to consume potentially-interfering natural polysaccharides. The samples are injected onto a cation exchange high performance liquid chromatography column and separated. Quantification is accomplished by comparing spiked samples and process control standards. This method was adapted from the method presented in FAP 9A4126. The results from 5 batches each of 5, 8.5 and 12% PDX in spreads are included. Recoveries range from 83 to 114% for peak height measurements and from 107 to 138% for peak area measurements. Although these recoveries are somewhat high, the relative standard deviations for the results are low, suggesting that the analytical results are precise. This methodology is acceptable.

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[1]A commercial software package @Risk from Palisade Corp. was used in the Monte Carlo mode with 20,000 iterations.

We have no questions concerning this petition at this time.

Michael DiNovi, Ph.D.

Table 1

Estimated Mean Consumption for Regulated Uses of Polydextrose*
(g/p/d, total sample)

Food Type (MRCA Category)		Polydextrose Exposure (2–5 year olds)	(2+ year olds)
Baked Goods (01)			
	Pies, fruit (01D)	0.4	0.8
	Pies, Custard (01E)	0.3	0.5
	Cakes (01G)	1.3	1.7
	Cookies (01L)	1.3	1.2
Chewing Gum (31)		0.2	0.1
Sugars, Frostings (17)			
	Frostings, icings (17C)	0.2	0.2
	Other sugars (17E)	0.0	0.0
Fats and Oils (04)			
	Mayonnaise, salad dressings (04C)	0.4	0.9
	Other dressings (04D)	0.2	0.9
Frozen dairy desserts (07)		3.8	4.5
Gelatins, Puddings, Custards (20)		1.7	2.5
Candy (16)			
	Cough drops (16E)	0.0	0
	Hard Candies (16F)	0.5	0
	Soft Candy, marsmallow–type (16G)	0.2	0.1
	Toffee, caramels (16H)	0.7	0.4
	Soft candy, gum–type (16I)	0.9	0.3
Total		12.1	14.3

* Based on MRCA 1982–87 Menu Census
and 1987–88 USDA Portion Sizes

Maximum use levels are as follows. 01D,E, 12.7%, 01G, 17%, 01L, 16.8%, 31, 64%, 17, 20.3%; 04C,D, 23.9%; 07, 19.6%; 20, 18.3%, 16E,F, 98%; 16G,H,I, 62.3% (Minimums: 60–70% of maximum, typicals 80–90% of max.)

Table 2

Estimated Mean Consumption for Regulated and Proposed Uses of Polydextrose*
(g/p/d, total sample)

Food Type (MRCA Category)		Polydextrose Exposure (2–5 year olds)	(2+ year olds)
Baked Goods (01)			
	Pies, fruit (01D)	0.4	0.8
	Pies, Custard (01E)	0.3	0.5
	Cakes (01G)	1.3	1.7
	Cookies (01L)	1.3	1.2
Chewing Gum (31)		0.2	0.1
Sugars, Frostings (17)			
	Frostings, icings (17C)	0.2	0.2
	Other sugars (17E)	0.0	0.0
Fats and Oils (04)			
	Mayonnaise, salad dressings (04C)	0.4	0.9
	Other dressings (04D)	0.2	0.9
Frozen dairy desserts (07)		3.8	4.5
Gelatins, Puddings, Custards (20)		1.7	2.5
Candy (16)			
	Cough drops (16E)	0.0	0.0
	Hard Candies (16F)	0.5	0.3
	Soft Candy, marsmallow–type (16G)	0.2	0.1
	Toffee, caramels (16H)	0.7	0.4
	Soft candy, gum–type (16I)	0.9	0.3
Nut Spreads (25)			
	Peanut Butter (25A)	1.2	0.7
Jams, jellys, sweet spreads (18)		0.7	0.5
Sweet sauces, toppings, syrups (19)		2.3	2.0
Tablespreads (04)			
	Butter (04B)	0.1	0.2
	Margarine (04A)	0.3	0.5
Vitamin, mineral tablets		0.0	0.0
Total		16.7	18.2

* Based on MRCA 1982–87 Menu Census
and USDA 1987–88 Portion Sizes

Maximum use levels are as follows 01D,E, 12.7%, 01G, 17%, 01L, 16.8%; 31, 64%; 17, 20.3%; 04C,D, 23.9%, 07, 19.6%, 20, 18.3%, 16E,F, 98%, 16G,H,I, 62.3%; 25A, 40%; 18, 25%; 19, 35%; 04A,B, 12%; Vitamin Supplements, 13 mg/tablet (minimum 60–70% of max; typical:80–90% of max.)

Table 3

Monte Carlo Simulation Reports

Monte Carlo Results – Regulated Uses (re: Table 1)

@RISK: Simulation Statistics
15-Sep-1992
Worksheet: POLYDEX1

	TOTAL2+ (in Cell H39)	TOTAL2-5 (in Cell F39)
Expected/Mean Result =	14.2	12.1
Maximum Result =	135.6	83.3
Standard Deviation =	8.7	7.1
Simulations Executed =	1	1
Iterations =	20000	20000

Percentile Probabilities
(Chance <= Shown Value)

50%	12.5	10.7
90%	24.7	20.8

Monte Carlo Results – Regulated, Proposed Uses (re: Table 2)

@RISK: Simulation Statistics
14-Sep-1992
Worksheet: POLYDEX2

	TOTAL2+ (in Cell H56)	TOTAL2-5 (in Cell F56)
Expected/Mean Result =	18.2	16.6
Maximum Result =	126.7	133.1
Standard Deviation =	9.2	7.6
Simulations Executed =	1	1
Iterations =	20000	20000

Percentile Probabilities
(Chance <= Shown Value)

50%	16.6	15.3
90%	29.7	26.0

User Toggle | Food Intake Dist. (g) g/p/d | % Use Level Dist. (min, Typical, max)

Food Int.

```
F10: (F1) [W12] @DISCRETE(0,75.83,1,24.17,2)*@LOGNORM(14.6389,8.5555)*@TRIANG(8,10,12.7)/100
H10: (F1) [W14] @DISCRETE(0,64.359,1,35.641,2)*@LOGNORM(22.6895,17.448)*@TRIANG(8,10,12.7)/100
F11: (F1) [W12] @DISCRETE(0,84.717,1,15.283,2)*@LOGNORM(18.4735,12.0416)*@TRIANG(8,10,12.7)/100
H11: (F1) [W14] @DISCRETE(0,78.178,1,21.822,2)*@LOGNORM(20.672,14.6403)*@TRIANG(8,10,12.7)/100
F12: (F1) [W12] @DISCRETE(0,35.107,1,64.893,2)*@LOGNORM(13.326,10.4001)*@TRIANG(12,14.5,17)/100
H12: (F1) [W14] @DISCRETE(0,35.839,1,64.161,2)*@LOGNORM(18.1623,15.6424)*@TRIANG(12,14.5,17)/100
F13: (F1) [W12] @DISCRETE(0,19.043,1,80.957,2)*@LOGNORM(11.3034,9.4919)*@TRIANG(12,14.5,16.8)/100
H13: (F1) [W14] @DISCRETE(0,33.503,1,66.497,2)*@LOGNORM(12.323,12.1639)*@TRIANG(12,14.5,16.8)/100
F15: (F1) [W12] @DISCRETE(0,72.119,1,27.881,2)*@LOGNORM(1.6024,1.7275)*@TRIANG(35,50,64)/100
H15: (F1) [W14] @DISCRETE(0,86.488,1,13.512,2)*@LOGNORM(2.1525,3.0742)*@TRIANG(35,50,64)/100
F19: (F1) [W12] @DISCRETE(0,78.564,1,21.436,2)*@LOGNORM(5.6996,4.551)*@TRIANG(14,17,20.3)/100
H19: (F1) [W14] @DISCRETE(0,84.277,1,15.723,2)*@LOGNORM(6.2328,5.3188)*@TRIANG(14,17,20.3)/100
F20: (F1) [W12] @DISCRETE(0,99.268,1,0.732,2)*@LOGNORM(1.0676,0.3858)*@TRIANG(14,17,20.3)/100
H20: (F1) [W14] @DISCRETE(0,99.74,1,0.26,2)*@LOGNORM(1.6985,1.191)*@TRIANG(14,17,20.3)/100
F25: (F1) [W12] @DISCRETE(0,27.881,1,72.119,2)*@LOGNORM(2.8001,2.3393)*@TRIANG(15,19,23.9)/100
H25: (F1) [W14] @DISCRETE(0,26.623,1,73.377,2)*@LOGNORM(6.3383,5.4789)*@TRIANG(15,19,23.9)/100
F26: (F1) [W12] @DISCRETE(0,56.689,1,43.311,2)*@LOGNORM(2.4468,1.907)*@TRIANG(15,19,23.9)/100
H26: (F1) [W14] @DISCRETE(0,38.552,1,61.448,2)*@LOGNORM(7.5564,6.1497)*@TRIANG(15,19,23.9)/100
F28: (F1) [W12] @DISCRETE(0,21.777,1,78.223,2)*@LOGNORM(29.724,25.4076)*@TRIANG(13,16,19.6)/100
H28: (F1) [W14] @DISCRETE(0,28.776,1,71.224,2)*@LOGNORM(38.6177,34.4937)*@TRIANG(13,16,19.6)/100
F30: (F1) [W12] @DISCRETE(0,52.051,1,47.949,2)*@LOGNORM(22.0067,20.2831)*@TRIANG(13,16,18.3)/100
H30: (F1) [W14] @DISCRETE(0,53.72,1,46.28,2)*@LOGNORM(34.3777,34.7098)*@TRIANG(13,16,18.3)/100
F34: (F1) [W12] @DISCRETE(0,99.609,1,0.391,2)*@LOGNORM(1.8875,1.8903)*@TRIANG(85,90,98)/100
H34: (F1) [W14] @DISCRETE(0,99.712,1,0.288,2)*@LOGNORM(2.7557,1.9592)*@TRIANG(85,90,98)/100
F35: (F1) [W12] @DISCRETE(0,76.904,1,23.096,2)*@LOGNORM(2.539,2.4319)*@TRIANG(85,90,98)/100
H35: (F1) [W14] @DISCRETE(0,91.091,1,8.909,2)*@LOGNORM(3.3099,4.1662)*@TRIANG(85,90,98)/100
F36: (F1) [W12] @DISCRETE(0,86.865,1,13.135,2)*@LOGNORM(3.4416,3.282)*@TRIANG(45,55,62.3)/100
H36: (F1) [W14] @DISCRETE(0,92.338,1,7.662,2)*@LOGNORM(1.6587,2.4588)*@TRIANG(45,55,62.3)/100
F37: (F1) [W12] @DISCRETE(0,81.934,1,18.066,2)*@LOGNORM(7.4873,10.2213)*@TRIANG(45,55,62.3)/100
H37: (F1) [W14] @DISCRETE(0,88.533,1,11.467,2)*@LOGNORM(6.389,7.3584)*@TRIANG(45,55,62.3)/100
F38: (F1) [W12] @DISCRETE(0,83.301,1,16.699,2)*@LOGNORM(9.7386,9.2288)*@TRIANG(45,55,62.3)/100
H38: (F1) [W14] @DISCRETE(0,92.521,1,7.479,2)*@LOGNORM(7.9363,8.0164)*@TRIANG(45,55,62.3)/100
```

F - series 2-5 y. olds

H - series 2+ y. olds

POLYDEXTROSE

User Toggle | Food Intake Dist (g) g/p/d | % Use Level Dist. (min, Typical, Max)

Food Cat.			
21D	F10: (F1) [W10]	@DISCRETE(0,75.83,1,24.17,2)*@LOGNORM(14.6389,8.5555)*@TRIANG(8,10,12.7)/100
	H10: (F1) [W14]	@DISCRETE(0,64.359,1,35.641,2)*@LOGNORM(22.6895,17.448)*@TRIANG(8,10,12.7)/100
21E	F11: (F1) [W10]	@DISCRETE(0,84.717,1,15.283,2)*@LOGNORM(18.4735,12.0416)*@TRIANG(8,10,12.7)/100
	H11: (F1) [W14]	@DISCRETE(0,78.178,1,21.822,2)*@LOGNORM(20.672,14.6403)*@TRIANG(8,10,12.7)/100
21G	F12: (F1) [W10]	@DISCRETE(0,35.107,1,64.893,2)*@LOGNORM(13.326,10.4001)*@TRIANG(12,14.5,17)/100
	H12: (F1) [W14]	@DISCRETE(0,35.839,1,64.161,2)*@LOGNORM(18.1623,15.6424)*@TRIANG(12,14.5,17)/100.
1L	F13: (F1) [W10]	@DISCRETE(0,19.043,1,80.957,2)*@LOGNORM(11.3034,9.4919)*@TRIANG(12,14.5,16.8)/100
	H13: (F1) [W14]	@DISCRETE(0,33.503,1,66.497,2)*@LOGNORM(12.323,12.1639)*@TRIANG(12,14.5,16.8)/100
1	F15: (F1) [W10]	@DISCRETE(0,72.119,1,27.881,2)*@LOGNORM(1.6024,1.7275)*@TRIANG(35,50,64)/100
	H15: (F1) [W14]	@DISCRETE(0,86.488,1,13.512,2)*@LOGNORM(2.1525,3.0742)*@TRIANG(35,50,64)/100
7C	F19: (F1) [W10]	@DISCRETE(0,78.564,1,21.436,2)*@LOGNORM(5.6996,4.551)*@TRIANG(14,17,20.3)/100
	H19: (F1) [W14]	@DISCRETE(0,84.277,1,15.723,2)*@LOGNORM(6.2328,5.3188)*@TRIANG(14,17,20.3)/100
7E	F20: (F1) [W10]	@DISCRETE(0,99.268,1,0.732,2)*@LOGNORM(1.0676,0.3858)*@TRIANG(14,17,20.3)/100
	H20: (F1) [W14]	@DISCRETE(0,99.74,1,0.26,2)*@LOGNORM(1.6985,1.191)*@TRIANG(14,17,20.3)/100
7C	F25: (F1) [W10]	@DISCRETE(0,27.881,1,72.119,2)*@LOGNORM(2.8001,2.3393)*@TRIANG(15,19,23.9)/100
	H25: (F1) [W14]	@DISCRETE(0,26.623,1,73.377,2)*@LOGNORM(6.3383,5.4789)*@TRIANG(15,19,23.9)/100
7D	F26: (F1) [W10]	@DISCRETE(0,56.689,1,43.311,2)*@LOGNORM(2.4468,1.907)*@TRIANG(15,19,23.9)/100
	H26: (F1) [W14]	@DISCRETE(0,38.552,1,61.448,2)*@LOGNORM(7.5564,6.1497)*@TRIANG(15,19,23.9)/100
7	F28: (F1) [W10]	@DISCRETE(0,21.777,1,78.223,2)*@LOGNORM(29.724,25.4076)*@TRIANG(13,16,19.6)/100
	H28: (F1) [W14]	@DISCRETE(0,28.776,1,71.224,2)*@LOGNORM(38.6177,34.4937)*@TRIANG(13,16,19.6)/100
	F30: (F1) [W10]	@DISCRETE(0,52.051,1,47.949,2)*@LOGNORM(22.0067,20.2831)*@TRIANG(13,16,18.3)/100
	H30: (F1) [W14]	@DISCRETE(0,53.72,1,46.28,2)*@LOGNORM(34.3777,34.7098)*@TRIANG(13,16,18.3)/100
6E	F34: (F1) [W10]	@DISCRETE(0,99.609,1,0.391,2)*@LOGNORM(1.8875,1.8903)*@TRIANG(85,90,98)/100
	H34: (F1) [W14]	@DISCRETE(0,99.712,1,0.288,2)*@LOGNORM(2.7557,1.9592)*@TRIANG(85,90,98)/100
6F	F35: (F1) [W10]	@DISCRETE(0,76.904,1,23.096,2)*@LOGNORM(2.539,2.4319)*@TRIANG(85,90,98)/100
	H35: (F1) [W14]	@DISCRETE(0,91.091,1,8.909,2)*@LOGNORM(3.3099,4.1662)*@TRIANG(85,90,98)/100
16G	F36: (F1) [W10]	@DISCRETE(0,86.865,1,13.135,2)*@LOGNORM(3.4416,3.282)*@TRIANG(45,55,62.3)/100
	H36: (F1) [W14]	@DISCRETE(0,92.338,1,7.662,2)*@LOGNORM(1.6587,2.4588)*@TRIANG(45,55,62.3)/100
6H	F37: (F1) [W10]	@DISCRETE(0,81.934,1,18.066,2)*@LOGNORM(7.4873,10.2213)*@TRIANG(45,55,62.3)/100
	H37: (F1) [W14]	@DISCRETE(0,88.533,1,11.467,2)*@LOGNORM(6.389,7.3584)*@TRIANG(45,55,62.3)/100
6I	F38: (F1) [W10]	@DISCRETE(0,83.301,1,16.699,2)*@LOGNORM(9.7386,9.2288)*@TRIANG(45,55,62.3)/100
	H38: (F1) [W14]	@DISCRETE(0,92.521,1,7.479,2)*@LOGNORM(7.9363,8.0164)*@TRIANG(45,55,62.3)/100
5A	F42: (F1) [W10]	@DISCRETE(0,26.855,1,73.145,2)*@LOGNORM(5.923,4.6633)*@TRIANG(20,25,40)/100
	H42: (F1) [W14]	@DISCRETE(0,58.657,1,41.343,2)*@LOGNORM(5.7366,5.2776)*@TRIANG(20,25,40)/100
19	F44: (F1) [W10]	@DISCRETE(0,25.391,1,74.609,2)*@LOGNORM(4.7959,3.7051)*@TRIANG(12,18,25)/100
	H44: (F1) [W14]	@DISCRETE(0,42.292,1,57.708,2)*@LOGNORM(5.1449,4.5774)*@TRIANG(12,18,25)/100
19	F46: (F1) [W10]	@DISCRETE(0,24.512,1,75.488,2)*@LOGNORM(10.0987,8.266)*@TRIANG(25,30,35)/100
	H46: (F1) [W14]	@DISCRETE(0,40.103,1,59.897,2)*@LOGNORM(11.4019,10.3303)*@TRIANG(25,30,35)/100
24B	F50: (F1) [W10]	@DISCRETE(0,43.506,1,56.494,2)*@LOGNORM(2.9719,3.299)*@TRIANG(5,8.5,12)/100
	H50: (F1) [W14]	@DISCRETE(0,41.814,1,58.186,2)*@LOGNORM(4.2088,4.9186)*@TRIANG(5,8.5,12)/100
24A	F51: (F1) [W10]	@DISCRETE(0,18.066,1,81.934,2)*@LOGNORM(4.4326,3.5504)*@TRIANG(5,8.5,12)/100
	H51: (F1) [W14]	@DISCRETE(0,19.23,1,80.77,2)*@LOGNORM(6.6459,5.869)*@TRIANG(5,8.5,12)/100
Vit.	F54: (F1) [W10]	@DISCRETE(0,1,1,1,2)*@DISCRETE(1,80,5,20,2)*0.013
	H54: (F1) [W14]	@DISCRETE(0,1,1,1,2)*@DISCRETE(1,80,5,20,2)*0.013

F.- Series 2-5 y.olds

H- Series 2+ y.olds

Estimated Sorbitol Intake

The 1987 USDA Food Additive Survey reported US sorbitol volume for food use was 63,800,000 lbs. This corresponds to 90.1 mg/kg bw/day, or 5.4 g/person/day (1) for eaters. This value is deemed low because:

- The 1987 FAS under sampled sugarless hard and soft candy manufacturers and did not survey cosmetic manufacturers (toothpaste, etc.).

- This value does not include intake from natural sources, e.g. pears, peaches, plums, cherries, apple juice (0.5% sorbitol) and prune juice (13%).

- Some dietary glucose is converted to sorbitol by aldose reductase in endogenous metabolism (2); this is not included either.

Therefore, 5.4 g/person/day sorbitol intake is an underestimate. We estimate daily sorbitol intake is closer to 7.5 to 8.5 g/person/day, or 125-170 mg/kgbw/day for a 50-60 kg person. This is compared to the intake from polydextrose for eaters of 5.0-10.9 mg/kgbw/day (mean-90th percentile at 2% of polydextrose intake from latest TAS estimates). Thus polydextrose as a source of sorbitol contributes maybe 4-6% of the total daily dietary exposure.

Based on the TAS polydextrose estimated intake data, exposure from all proposed new uses would increase the daily sorbitol intake from polydextrose to 7.6-14.6 mg/kgbw/day (mean-90th %ile). In comparison, sugarless chewing gum has 1.2-1.5 g sorbitol/stick.

References

1. S. W. Bigelow and D. M. Graham, 1994. Food Additives: Consumer Surveys, in Encyclopedia of Food Science, Food Technology and Nutrition, R. Macrae, R. K. Robinson and M. Sadler, eds., Academic Press, London, pp 1954-1965.

Derivation of daily intake from annual poundage:

$$\frac{[(\text{annual poundage in 1987})(1\ \text{kg}/2.2\ \text{lb})(1\ \text{yr}/365\ \text{days})(1{,}000{,}000\ \text{mg/kg})}{[(244{,}900{,}000\ \text{people in 1987})(60\ \text{kg/person})(0.6\ \text{factor for underreported volume})(0.1\ \text{factor for eaters})]}$$

63,800,000/708,000 = 90.1 mg/kgbw/day

2. LSRO FASEB, Dietary Sugars in Health and Disease. III. Sorbitol, US FDA Contract 223-75-2090; March 1979

Evaluation of the GRAS Status of New Uses of Polydextrose

Summary Report – 4/23/02

Introduction

Polydextrose (PDX) is a synthetic, water-soluble low-calorie carbohydrate polymer prepared by the bulk melt polycondensation of glucose and sorbitol (~9:1 ratio) in vacuo in the presence of catalytic amounts of citric or phosphoric acids. The commercial product also contains a few percent of the residual free monomers glucose and sorbitol, along with a small amount of anhydroglucose (levoglucosan). It is used primarily as a bulking agent, humectant and texturizer in reduced calorie foods and is currently approved under 21 CFR 172.841 for use in:

Sweet Baked Goods and Baking Mixes	Confections and Frostings
Frozen Dairy Desserts	Hard and Soft Candies
Salad Dressings	Gelatins, Puddings and Fillings
Peanut Spreads	Fruit Spreads, Jams and Jellies
Sweet Sauces, Toppings and Syrups	Chewing Gum
Fruit and Water Ices	Table Spreads

This product has been manufactured in the US and sold in the US and 56 other countries for up to 20 years. Details of the manufacturing process are given in the original food additive petition (9A3441 – 4/17/79; 44 FR 22816). Product specifications are given in the Food Chemicals Codex, 4th edition 2nd supplement (see attached Section I). Analytical results for five non-consecutive production batches vs specifications are also listed in that section.

A panel of scientists qualified by training and experience was assembled by Danisco Cultor on April 2-3, 2002, to assess the potential GRAS status for proposed new uses of PDX. Please refer to Section V for resumes of the panel members. The proposed new uses are:

RTE Breakfast Cereals	Non-sweet Baked Goods
Breading and Batter Coatings	Surimi (Minced Fish and Meats)
Snack chips (corn, potato, rice and pretzels)	RTD Nutritional Beverages
Crackers (flavor bits)	Non-carbonated Beverages (excluding fruit juices and fluid milk)

The generic PDX nomenclature encompasses five product variations, all covered by published specification monographs (see Section I C and D). These are incorporated herein and distinguished as follows:

1. PDX-A: the basic melt-polymerized condensation polymer
2. PDX-N: a 70% solution of PDX-A is neutralized to pH 7.0 with KOH or K_2CO_3 (also known as PDX-K). Potassium-neutralized PDX is not commercially produced at this time.
3. Litesse: an aqueous solution of PDX-A is passed through a mixed bed ion exchange resin column and the eluent solution is dried.
4. Litesse II: the aqueous solution of PDX-A above is passed through two mixed bed ion exchange resin columns and the eluent solution is dried.
5. Litesse Ultra: an aqueous solution of PDX-A is catalytically hydrogenated over Raney nickel; the resulting solution is passed through a mixed bed ion exchange resin and the eluent solution is dried (also known as PDX-H or Litesse III). In addition to converting reducing polymer glucose endgroups to non-

reducing sorbitol endgroups, the hydrogenation process converts the residual free glucose to free sorbitol.

PDX has a weight average molecular weight (Mw) of ~2000 and average degree of polymerization (DP) of ~12. All possible glycosidic linkages with the anomeric carbon of glucose are present, including α- and β1-2, 1-3, 1-4 and 1-6, with some branching; the 1-6 linkage predominates. As a result, PDX is resistant to the action of enzymes of the upper digestive tract so that the majority of ingested polydextrose passes into the colon, where approximately half is fermented by the intestinal flora while half is excreted with the feces. Metabolically, PDX belongs to the group of natural and synthetic partially digestible carbohydrates which includes lactulose, resistant starches, oligosaccharides, and some soluble fiber isolates (e.g. plant gums). All these substances cause similar gastrointestinal effects if consumed in excessive amounts.

The Panel was provided with a search of the scientific literature, dietary exposure data, summaries of animal and human safety studies and FAO/WHO JECFA review documents. The Panel independently and critically evaluated these documents and other materials deemed appropriate. They then met with representatives of Danisco Cultor on April 3, 2002, in Ardsley, NY, and considered all available information in arriving at its conclusions.

Safety

Studies in rodent and non-rodent species included acute, subchronic, chronic, reproduction and development, biodisposition and genetic toxicity studies. Details are given in Section II.

PDX when administered in the diet is poorly absorbed, not metabolized, but partially degraded by colonic bacteria to carbon dioxide, volatile fatty acids and related compounds. The lack of absorption and resistance to metabolism results in movement of water into the GI tract (osmotic effect) and results in dose-dependant stool softening. At extremely high doses (50% of the diet), watery diarrhea was observed in dogs. PDX-K in dogs at these dose levels created an electrolyte imbalance to the extent that serum calcium levels were significantly increased, resulting in high urinary calcium levels and nephrocalcinosis. This effect was attributed entirely to the extremely high potassium intake and not to the PDX polymer itself. This did not occur with PDX-A or in the absence of chronic watery diarrhea. PDX is not carcinogenic, mutagenic, teratogenic, and exhibited no toxicity in reproduction studies.

The effects observed in animals were limited to the GI tract. The animal studies were critically evaluated in detail by Flamm and Burdock in 1999 [GA Burdock, W G Flamm. 1999. A review of the studies of the safety of Polydextrose in food, Food Chem. Toxicol., 37(2/3):233-264], and this evaluation was considered by the panel in its deliberations. Flamm and Burdock concluded (ibid, p 263):

> "The conclusions relevant to this work are that omnivores such as rats, mice and monkeys are relatively refractory to the effects of polydextrose with a no-effect level for systemic toxicity at 2500 to 10,000 mg/kg body weight/day."

The only effect reported in humans was a dose-dependent stool softening at high intakes. Seven human clinical studies were critically evaluated. Details are given in Section III and summarized below.

Gastrointestinal Toleration

The gastrointestinal toleration of humans to high oral doses of polydextrose has been determined in 7 clinical studies. Details are given in Section III. The results demonstrate that a daily consumption of 50 g, even if consumed as a single dose, is unlikely to cause gastrointestinal effects, except in particularly sensitive persons and in young children. It was also found that polydextrose is significantly better tolerated than sorbitol.

From a study in which adult participants received polydextrose in amounts of up to 130 g/day (2.2 g/kg bw), a mean laxative threshold of 90 g/day (1.5 g/kg) was determined. The mean laxative threshold is defined as the daily dose that would cause a laxative effect in half the consuming population.* In a study with children in 5 age groups with increasing doses from 5 to 55 g/day, corresponding to ~0.5-1.0 g/kgbw, the mean laxative threshold was estimated to be above the highest dose tested in each age group, or 1.0 g/kgbw. The results are summarized below.

Age Group	Weight Range	Highest Dose	Mean Laxative Dose
2- 3 y	11.4-20.0 kg	15 g/day	> 15 g.day (> 1.0 g/kgbw)
4- 6 y	14.1-29.1 kg	20 g/day	> 20 g/day (> 1.0 g/kgbw)
7- 9 y	20.9-40.9 kg	30 g/day	> 30 g/day (> 1.0 g/kgbw)
10-12 y	25.9-56.8 kg	40 g/day	> 40 g/day (> 1.0 g/kgbw)
13-16 y	35.0-76.8 kg	55 g/day	> 55 g/day (> 1.0 g/kgbw)
adult	60 kg+	130 g/day	90 g/day (1.5 g/kgbw)

Estimated Exposure - Polydextrose

Estimated daily intake of polydextrose from currently approved and proposed new uses was determined by Novigen Sciences Inc. from the 1994-96 USDA Continuing Survey of Food Intakes by Individuals (CSFII; see Section IV A) using their FARE™ software. These estimates assume polydextrose is consumed in all foods in which it is approved, a highly unlikely scenario. The results are summarized below:

	3-day average per user g/person/day for total population age 2+			
	Typical Use Levels		Maximum Use Levels	
	Mean	90th %ile	Mean	90th %ile
Total Current Uses	8.6	19.3	18.2	39.7
Total Current and Proposed Uses	16.3	32.1	31.5	61.6

For all current and proposed new uses of polydextrose at their maximum projected use level, the mean intake of users is still well below the experimentally determined mean laxative threshold (90 g/day).

Estimated Exposure - Sorbitol

Polydextrose contains up to 2% residual sorbitol, and thus represents a minor source of dietary sorbitol. Based on the above table, we also estimated the contribution of sorbitol to the diet from polydextrose use.

---

* In the 1987 report of its 31st meeting, JECFA stated, "Studies in man have demonstrated that polydextroses, when administered at very high doses, exert a laxative effect, with a mean laxative threshold of 90 g per day or 50 g as a single dose."

	3-day average per user g/person/day for total population age 2+			
	Typical Use Levels		Maximum Use Levels	
	Mean	90th %ile	Mean	90th %ile
Total Current Uses	0.17	0.39	0.36	0.79
Total Current and Proposed Uses	0.33	0.64	0.63	1.23

This is compared to the estimated daily intake of sorbitol from all sources of 7.5-8.5 g/person/day (see Section IV C). Thus sorbitol from polydextrose would represent less than 10% of daily sorbitol intake. For comparison purposes, the mean exposure at maximum use level in all current and proposed uses - 0.63 g - represents less than the amount of sorbitol in one stick of sugarless chewing gum (1.2-1.5 g sorbitol).

Conclusions – The Panel

1. concluded that the only significant dose-dependent effect of polydextrose intake is laxation/loose stools.

2. critically evaluated the seven studies encompassing 264 adults and concluded the mean laxative threshold of PDX is 90 g/day or 50 g as a single dose. This concurs with the conclusion by JECFA based on their evaluation of the PDX clinical studies.

3. recognized that the laxation threshold in children will be less than 50 g/person/day due to the higher consumption of food per unit body weight. It was not possible to estimate the actual laxation threshold in children with any confidence as the entire data available resulted from a single study comprising 54 subjects with 11-12 subjects/age group. The amount of PDX consumed by children, based on maximum use levels for current and proposed uses, may exceed the threshold. However, the Panel concluded that the calculated consumption figures most likely exceeded the actual consumption by a significant margin, based on the conservative nature of the intake estimation process, suggesting that a lower laxation threshold for children would not likely be of concern.

4. concluded that use of PDX is GRAS for the uses described herein where the total of estimated intakes does not exceed 90 g/day or 50 g at a single eating occasion.

GRAS Expert Panel Membership

Herbert Blumenthal, Ph.D.
Consultant

Joseph F. Borzelleca, Ph.D. 24 April 2002
Professor of Pharmacology and Toxicology
Medical College of Virginia

Joseph H. Hotchkiss, Ph.D.
Professor of Food Science
Cornell University

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GRAS Expert Panel Membership

April 24, 2002

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Consultant

Joseph F. Borzelleca, Ph.D.
Professor of Pharmacology and Toxicology
Medical College of Virginia

Joseph H. Hotchkiss, Ph.D.
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GRAS Expert Panel Membership

Herbert Blumenthal, Ph.D.
Consultant

Joseph F. Borzelleca, Ph.D.
Professor of Pharmacology and Toxicology
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4/24/02

Joseph H. Hotchkiss, Ph.D.
Professor of Food Science
Cornell University

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PLEASE SEE APPENDED BIBLIOGRAPHY FOR A LIST OF THE REFERENCES THAT
HAVE BEEN REMOVED FROM THIS REQUEST

End Submission

Reference List for Industry Submission, GRN 000107

Pages	*Author*	*Title*	*Publish Date*	*Publisher*	*BIB Info*
000013-000017	NA	Pentaerythritol Ester of Partially Hydrogenated Wood Rosin/Monograph Specifications	31 March 2000	Food Chemicals Codex	2nd. Supp., 4th ed., pp. 24-27
000037-000062	Burdock, G.A., Flamm, W.G.	A Review of the Studies of the Safety of Polydextrose in Food	1999	Food and Chemical Toxicology	Vol. 37, pp. 233-264

NA- Not applicable

AM

Lubin, Lisa

From: Michael Auerbach
Sent: Tuesday, October 01, 2002 4:20 PM
To: Lubin, Lisa
Subject: Re: GRN 107 - polydextrose

GI toler
udies-sum.xls (21 K

Here is the attachment. Kind regards, Mike A
(See attached file: GI toler studies-sum.xls)

Dear Dr Lubin, attached is a spreadsheet listing 16 human clinical studies run on polydextrose for your reference. Eight of these have been published. One of them, the Bamba study, is likely not relevant because it was a colonic infusion study rather than using oral dosing.

I will be pleased to submit to you formally a summary of each published study along with a complete copy in support of our GRAS notice 107. Please advise if this would be appropriate.

Thanks for your consideration and kind regards, Mike A

Michael H Auerbach, PhD
Senior Science Advisor, Regulatory Affairs
Danisco USA Inc.
20 Saw Mill River Road
Ardsley, NY 10502-2605
800-255-6837 x2506 phone
914-674-6533 fax

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Clinical Studies of Polydextrose

Investigator	Site	Date	Subjects	Initial Dose, g		Final Dose, g		Duration	Published
				Highest single	Total daily	Highest single	Total daily		
Knirsch	Pfizer	Sep-74	19 male adults	16-24	35-40			10 days	(1)
			20 male adults	16-34	73-80			10 days	
McMahon	Tulane Univ.	Sep-74	10 Type 2 diabetics	50	50	50	50	single dose	(1)
Raphan	Pfizer	Feb-75	21 adults		40		130	10 days	(1)
Bunde	Hilltop Lab	Jul-75	11 children 2-3 yo	5	5	10	15	6 weeks	(1)
			11 children 4-6 yo	10	10	10	20	6 weeks	
			12 children 7-9 yo	10	15	15	30	6 weeks	
			12 children 10-12 yo	10	20	15	40	6 weeks	
			12 children 13-16 yo	15	30	20	55	6 weeks	
Scrimshaw & Young	MIT	Oct-77	10 young adults	15	30	20	50	8 weeks	(1)
Tomlin & Read	Sheffield UK	Sep-88	12 male adults	10-30	10-30	10-30	10-30	10 days	(3)
Nakagawa et al	Hino, Japan	May-89	22 adolescent females	5	5	10	10	4 weeks	(4)
Beer	Univ TX	Sep-89	24 male adults	14-58	14-58	14-58	14-58	single dose	
Curtis	Harris Labs	Oct-90	160 female adults	14-58	14-58	14-58	14-58	single dose	
Endo et al	Saitama, JPN	Jan-91	6M/2F adults	15	15	15	15	2 weeks	(5)
Saku et al	Fukuoka, JPN	Feb-91	25M/26F adults	15	15	15	15	2 months	(6)
Achour et al	Paris, France	Oct-92	7 adult males	10	30	10	30	3 weeks	(7)
Bamba et al (2)	Shiga, Japan	Nov-92	5 healthy adults	5% solution				single dose	(8)
Liu & Tsai	Taipei, Taiwan	Jan-94	10 young adults	10	10	10	10	18 days	(9)
Zhang et al - Chin Army	PR China	1998	28 constipated adults	8	8	8	8	30 days	(11)
			80 healthy adults	8	8	8	8	6 months	
Zhong et al	FTC, PR China	1999	66M/54F adults	4	4-12	4	4-12	4 weeks	(10)

1. Unpublished studies submitted to FDA with original FAP
2. Polydextrose solution administered by colonic infusion
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healthy non-obese men. Am. J. Clin. Nutr. 59, 1362-8
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11. Unpublished study - Zhang X, Li X, Zhang R, Xue C, Zheng Z, Xue J. 1998. Clinical application of a new water-soluble dietary fibre, General Hospital of People's Liberation Army

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AM

DANISCO

Danisco USA Inc., 440 Saw Mill River Road, Ardsley, NY 10502-2605

To: Dr Linda Kahl – FDA DBGNR **Date:** 10/7/2002 9:22 AM

Loc'n/Fax No.: Colelge Park, MD – 202-418-3428

Cc: Ms. Lisa Lubin

From: Michael H. Auerbach, PhD, Senior Science Advisor, Regulatory Affairs

Tel: 800-255-6837 x2506 **Fax:** 914-674-6533
914-674-6300 x 2506

No. of Pages including Cover: 2 **Email:**

FAX COVER SHEET

MESSAGE – *CONFIDENTIAL !*

Dear Dr. Kahl:

Attached is a letter from us regarding the subject GRAS Notice. GRN 107

Kind regards, M.H. Auerbach

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DANISCO

MICHAEL H. AUERBACH, Ph.D.
Senior Science Advisor, Regulatory Affairs
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October 3, 2002

Dr Linda Kahl, DBGNR
Office of Food Additive Safety, HFS-255
Center for Food Safety and Applied Nutrition
Food and Drug Administration, HFS-255
5100 Paint Branch Parkway
College Park, MD 20740

Re: GRAS Notice GRN 107

Dear Dr.Kahl:

This is in reference to our GRAS Notice on polydextrose which was submitted April 29, 2002. We wish to inform you that Danisco USA (formerly Danisco Cultor America) has retained the law firm of Keller & Heckman to represent us in further discussions regarding this notice.

We would like to arrange a meeting with you at your earliest convenience to discuss FDA's concerns about this submission and possible ways that we might address them. Good dates for us are:

Wed. Oct. 9 – PM
Fri. Oct 11 – all day until 3 PM
Mon. Oct 14 – PM
Wed. Oct 16 – AM
Thurs Oct 17 – all day
Fri. Oct 18 – all day

Thank you for your consideration. We look forward to hearing from you soon.

Sincerely,

M. H. Auerbach

Cc: Lisa F. Lubin, MS, RD
Melvin Drozen, Keller & Heckman

000079

AM

DANISCO

Danisco USA Inc., 440 Saw Mill River Road, Ardsley, NY 10502-2605

To: Ms Lisa Lubin– FDA DBGNR **Date:** 10/17/2002 1:17 PM

Loc'n/Fax No.: Colelge Park, MD – 202-418-3428

Cc:

From: Michael H. Auerbach, PhD, Senior Science Advisor, Regulatory Affairs

Tel: 800-255-6837 x2506
914-674-6300 x 2506

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Email: michael.auerbach@danisco.com

No. of Pages including Cover: 2

FAX COVER SHEET

MESSAGE – *CONFIDENTIAL !*

Dear Ms Lubin:

Attached is a letter from us regarding GRAS Notice GRN 000107.

Kind regards, M. H. Auerbach

DANISCO

MICHAEL H. AUERBACH, Ph.D.
Senior Science Advisor, Regulatory Affairs
E-mail: michael.auerbach@danisco.com

Danisco USA Inc.
440 Saw Mill River Road
Ardsley, NY 10502-2605
Telephone: 800-255-6837 x2506
Telefax: 914-674-6533

October17, 2002

Ms Lisa F Lubin, DBGNR
Office of Food Additive Safety, HFS-255
Center for Food Safety and Applied Nutrition
Food and Drug Administration
5100 Paint Branch Parkway
College Park, MD 20740

Re: GRAS Notice GRN 000107

Dear Ms Lubin:

The purpose of this letter is to inform you that Danisco is hereby withdrawing GRN 000107 for polyexrose and to request that FDA terminate its review of the GRAS notice. This action is taken with the understanding that the Company may, in the future, submit another GRAS notice or make another appropriate submission for polydextrose to FDA.

Thank you for your assistance and attention to this matter.

Sincerely,

M. H. Auerbach

Cc: Melvin Drozen, Keller & Heckman