

**Petition for Inclusion
of
Sugar Beet Fiber onto the National List, § 205.606**

A. Section for Inclusion on the National List

Non-organic agricultural substances allowed in or on processed products labeled as “organic.” § 205.606.

B. Petitioned Substance

1. Name: Sugar beet fiber, Fibrex[®] [Appendix 1]

2. Manufacturer

Corporate Headquarters

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Manufacturing Facility

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3. Current Use/Intended Use

Sugar beet fiber is used in various food formulations as an anticaking agent; binding agent; bulking agent; dispersing agent; source of dietary fiber; stabilizing agent; texturizing agent; or as a thickening agent. The use is self-limiting because of the texture and taste of the sugar beet fiber. For most uses, the sugar beet fiber is about 1-3% of the food product; 1-5% for bread products, and 1-10% for cereals and muesli.

Sugar beet fiber is used in the following products:

- Non-standardized meat products such as beef and poultry patties, chicken links etc
- Fish products
- Bakery products
- Ready meals
- Pasta
- Cereals, mueslis
- Snacks
- Soups
- Fruit fillings
- Beverages

4. List of the Crop, Livestock or Handling Activities (Not relevant)

5. Manufacturing Process

Sugar beets are washed, sliced, and soaked in hot water to extract the sugar and other water soluble components. The sugar solution is filtered and the pulp is mechanically pressed to remove the remaining water. The beet pulp from the sugar extraction process is the starting material for production of the sugar beet fiber used in food. The Fibrex[®] process is to wash, heat, dry, and grind/mill the fiber to specific grades. No chemicals are added in this process. Information on the Fibrex[®] manufacturing process and the HACCP plan are provided in Appendix 2.

6. Summary of Previous Review by State or Private Certification Programs or other Organizations

The facility is ISO certified (ISO 9001, 14001, and 22000) and OHSAS 18001 certified [Appendix 3].

7. Regulatory Status

Fibrex[®] sugar beet fiber was self-affirmed as GRAS in 1991 [Appendix 4]. Food grade specifications for sugar beet fiber (Fibrex[®]) is listed in the Food Chemicals Codex monograph for use as an anticaking agent; binding agent; bulking agent; dispersing agent; source of dietary fiber; stabilizing agent; texturizing agent; and a thickening agent.

The Health Protection Branch, Health and Welfare, Canada confirmed the use of Fibrex[®] sugar beet fiber as a source of dietary fiber in food in 1989 [Appendix 5].

Fibrex[®] is certified as organic by KRAV, Sweden. [Appendix 6]. (Complies with EU Regulation (EEG) No. 834/2007 valid until December 31, 2010. This is valid for the few pallets of product remaining that were made from organic beet that are still in our warehouse.)

Fibrex[®] is certified as a Halal and Kosher product [Appendix 7].

Statement from Ystad Kommun, that certifies that the factory is approved for production of goods for human consumption [Appendix 8].

8. CAS No.: None

9. Physical Properties and Chemical Mode of Action

As noted in item 5, Fibrex[®] is produced from the sugar beet pulp obtained after extracting the sugar from the sugar beets. The Fibrex[®] process allows for the pulp to be washed, dried, and ground to specific grades of Fibrex[®] sugar beet fiber [Appendix 1]. This is a non-destructive process and Fibrex[®] continues to be a rich source of pectin. The ratio of insoluble to soluble fiber for Fibrex[®] sugar beet fiber is 2 to 1.

- (a) Chemical interactions with other substances, especially substances used in organic production;

The fiber is not expected to chemically interact with other substances.

- (b) toxicity and environmental persistence;

There is no toxic effect of this fiber. The product is biodegradable and is not expected to be hazardous to the environment.

- (c) environmental impacts from its use and/or manufacture;

The product is produced from beet pulp, which is a co-product from the production of sugar from beets. Use of energy and emissions to air are the main environmental impact from the production. There are no special environmental impacts from the use of the product.

- (d) effects on human health;

- improved bowel function
- decreased cholesterol levels
- flatter blood-glucose curve after meal

- (e) effects on soil organisms, crops, or livestock.

The fiber is not expected to have any adverse effect on soil organisms, crops or livestock.

10. Safety Information

The GRAS Expert Panel convened in 1991 to examine the safety of Fibrex[®] sugar beet fiber [Appendix 4]. The Panel recognized that the sugar beet and the red beet are of the same species, and that the sugar beet was grown as a garden vegetable and fodder for centuries before use as a source of sugar (sucrose). The fibers from both beets have the same percentage of soluble fiber content and that the fiber composition is made up of monosaccharides ordinarily found in other vegetable fibers. Thus, the sugar beet fibers are no different from other vegetable fibers available in the diet.

The Material Safety Data Sheet is appended [Appendix 9].

A substance report from the National Institute of Environmental Health Studies. *Does not exist.*

11. Research Information

Literature searches have been conducted on sugar beet fiber through January 2011. A bibliography of relevant literature associated with safety and technical effects of Fibrex[®] and other sugar beet fibers is found in Appendix 10.

Human and animal studies have reported that sugar beet fiber has a potential as a dietary aid in the treatment of hypercholesterolemia and constipation. Similar to other studies where patients have been fed dietary fiber, researchers have reported that the consumption of sugar beet fiber did not inhibit absorption of minerals such as iron and zinc, and resulted in a lowering of LDL cholesterol. In addition, feeding sugar beet fiber to non-insulin-dependent diabetic patients resulted in a beneficial effect to blood glucose and triglyceride levels.

Health Effects

Lampe et al., (1991) reported a reduction in total cholesterol due to significant lowering of LDL cholesterol in a study with 34 subjects consuming six controlled diets of wheat bran (0, 10 and 30 g), mixed vegetable fiber (10 and 30 g), and sugar beet fiber (30 g) for 3 weeks each. They reported reduction in total cholesterol with sugar beet fiber largely due to significant lowering of LDL cholesterol.

Israelsson et al., (1993) studied 30 women (55-56 years old) with 30 g sugar beet fiber (Fibrex[®]) or placebo in a placebo controlled, double blind crossover study after a one month "run in". Compared to the control group, intervention with sugar beet fiber resulted in a reduction of serum cholesterol by 0.26 mmol/l after two weeks and 0.2 mmol/l after four weeks. Reduction was restricted to LDL cholesterol which decreased by 0.22 mmol/l after two weeks and by 0.30 mmol/l after four weeks without much change in the HDL cholesterol level.

Cossack and Musaiger (1991) conducted a study to test the effect of fiber supplementation (Fibrex[®]) for hypercholesterolaemia in desert Nomads. They studied ten males in three phases: 1) baseline with the normal diet (two weeks), 2) fiber supplementation (26 g/day) for five weeks, and 3) four weeks where the fiber supplementation was withdrawn. The intake of nutrients, body weight, and HDL cholesterol levels did not change significantly. There was a significant decrease in total serum cholesterol (10 and 13%), LDL cholesterol (14 and 17%), and the LDL/HDL ratio (5 and 10%) after two and five weeks on the fiber supplementation. Serum triglycerides did not change significantly after two weeks but decreased about 10% after five weeks of supplementation.

Hagander et al., (1986) evaluated the effect of sugar beet fiber (Fibrex[®]) on the response of glucose in nine non-insulin-dependent diabetic (NIDD) patients and its relation to plasma levels of pancreatic and gastrointestinal hormones. Standardized breakfasts with or without 10.9 g sugar beet fiber (Fibrex[®]) resulted in a lower glucose plateau level and area under the curve than the control meal and a slower glucose decrease compared to the control. There were no notable differences with the plasma levels of insulin, C-peptide or glucagon. The gastric inhibitory polypeptide response was greater during the first part of the curve while the somatostatin response after the fiber meal displayed a significantly larger total area below the curve. The results suggested that the diminished glycemic response after the beet-fiber meal is associated with an increased response of somatostatin, giving a reduced glucose absorption and a delayed gastrointestinal transit time.

Hagander et al., (1988a) have reported an effect on the rate of carbohydrate absorption, expressed as a lower insulin response in eight healthy volunteers three hours after they were fed 10.9 g sugar beet fiber (Fibrex[®]).

Hagander et al., (1988b) evaluated the metabolic effects of dietary fiber without changing energy intake or proportions of protein, fat and carbohydrates in a group of 14 NIDD patients whose diabetes was controlled satisfactorily by diet alone and found a beneficial effect. The high-fiber diet induced lower fasting blood glucose levels and decreased the ratio of low-density lipoproteins to high-density lipoproteins. Continuous glucose monitoring also showed a difference in fasting glucose levels that remained after identical low-fiber test meals. The incremental glucose responses did not differ. The fasting and incremental postprandial levels of insulin, C-peptide, glucagon, and somatostatin did not change, while the mean triglyceride concentrations were lower after the high-fiber diet.

Hagander et al., (1989) conducted a study on the influence of a sugar beet fiber-enriched (Fibrex[®]) diet on blood pressure, plasma lipoproteins and glycemic control in 12 NIDD patients. The fiber-enriched and control diets were given in randomized order for eight weeks each. After both diet periods, the total plasma cholesterol and triglyceride levels were decreased. Blood glucose levels and glycosylated hemoglobin were not affected during the two different diet periods. The postprandial insulin levels were lower after the fiber diet compared to the control diet in obese patients.

Morgan, et al., (1988) investigated the effect of sugar beet fiber (SBF) on glucose tolerance, insulin, gastric inhibitory polypeptide (GIP) secretion, and circulating lipids in comparison with guar gum and wheat bran. Post-prandial peak arterialized blood glucose concentration were significantly reduced by a 100 g carbohydrate meal supplemented with 10 g guar gum or SBF, compared with an unsupplemented control. Plasma insulin fluctuation was reduced by guar gum but not by SBF. Plasma GIP levels were significantly reduced by guar gum and increased by SBF at 40 minutes when insulin and glucose levels were maximal. Volunteers also consumed bread incorporated with one of the fibers as part of the diet for 14 days. Fasting blood samples were taken weekly for 14 days before, during, and for 14 days after each fiber supplementation period. Plasma total cholesterol levels were reduced by 11.7 and 4.6% by guar gum and SBF, respectively, but were unchanged by bran.

Thorsdottir et al., (1998) investigated the effects of sugar beet fiber (Fibrex[®]) in formula diet on blood glucose, serum insulin and serum hydroxyproline in fifteen healthy male volunteers (mean age 25, range 21-42). Two formula test meals with and without 7 g of sugar beet fiber were fed to the subjects on two morning in a clinic after a 12 hour fast. Blood samples were drawn before and after the test meals and terminated 155 minutes after ingestion. The test formula with sugar beet fiber reduced the postprandial blood glucose response, serum insulin response, and serum hydroxyproline response compared to the control formula. The sugar beet fiber in the formula lowered incremental areas over 1 hour for glucose, insulin and hydroxyproline by 24%, 23%, and 21%, respectively, and by 19% and 21% for glucose and insulin over 2 hours.

Langkilde et al., (1993) studied the effect of sugar beet fiber (Fibrex[®]) on sterol excretion from the small intestine in nine ileostomy subjects. They were given a low-fiber diet in two three-day periods with and without 32 g sugar beet fiber per day in random order. The addition of sugar beet fiber increased net cholesterol excretion and decreased bile acid excretion. This effect is different from the pattern associated with other fiber sources, and the authors concluded that the interaction between dietary fiber and sterol metabolism may be mediated by different mechanisms depending on the fiber source.

Phytic acid, present in relatively high concentration in cereal brans, inhibit the absorption of the minerals, iron and zinc. Sandstrom and coworkers used isotope-labeled zinc (⁶⁵Zn) in composite meals with and without Fibrex[®] using 39 volunteers and measured whole body retention of the radioisotope. Low zinc chicken meals with 150 g white bread or 225 g potatoes, carrots, turnips, cabbage, or green peas were studied. The mean percentage absorption from the chicken meals with bread, carrots and cabbage was significantly

different from the meals with potatoes, turnips and green peas. When the amount of Zn in the meals was taken into account a slightly higher absorption was observed from the bread meal compared with the meals with potatoes and cabbage, while no differences were seen between the vegetable meals. The effect of a beet-pulp-fiber preparation used as a breakfast cereal, in bread and as a meat extender was also studied. The beet-pulp-fiber preparation did not affect the extent of Zn absorption when used as a meat extender. The absorption of Zn was higher when the beet fiber was included in bread than when used as a muesli. The authors conclude that the results suggest that besides the low Zn content in vegetables, a large intake of vegetables or a pure vegetable fiber preparation has no significant effect on Zn availability from animal-protein based meals.

Hallberg (in manuscript) demonstrated that there was no inhibiting effect on the absorption of iron and zinc in meals containing Fibrex[®]. Hallberg fed 10 volunteers spaghetti with meat sauce with and without Fibrex[®]. Using isotope-labeled iron (⁵⁹Fe), no difference was found between groups when monitoring absorption of the minerals after two weeks.

Hamberg et al., (1989) reported that dietary fibers (wheat bran, sugar beet fiber, and pea fiber) impaired the absorption of wheat starch, and thereby increased the amount of starch-derived carbohydrate available for colonic fermentation. Eight healthy subjects were fed bread made from 100 g wheat flour and were compared with each dietary fiber fed simultaneously. Hydrogen excretion in the breath was measured after the test meals and compared. Concurrent ingestion of the bread with either wheat bran, sugar-beet fiber, or pea fiber increased the fraction of unabsorbed starch to 12.5%, 12.5%, and 12%, respectively. All three fibers decreased mouth-to-caecum transit time. Bread made from 100 g of low gluten wheat flour only escaped small bowel absorption in three subjects with a maximal fraction of 6%.

Functionality Studies

Sakac et al., (2009) estimated the physico-chemical characteristics of sugar beet fibers extracted with sulfurous acid (untreated fiber-UTF), fiber treated with hydrogen peroxide (treated fiber-TF), and commercially available Fibrex[®]. These fibers were tested using: Folin-Ciocalteu reagent, 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay, antioxidant activity/ β -carotene bleaching test (AOA), chelating activity on Fe^{2+} and $\text{Fe}^{3+}/\text{Fe}^{2+}$ reducing power. The results demonstrated antioxidant activity from all ethanol extracts, with the lowest from TF and the same amount of chelating activity for all fiber extracts. DPPH scavenging activities was about two times higher for TF compared to the other two fibers but much lower than BHT and α -tocopherol. The reducing activity was lowest for TF, and the other two fibers had similar activity.

Application Studies

Ozboy and Koksel (2000) added sugar beet fiber to corn grits at levels of 10, 20, 30, and 40% to produce high fiber extruded products. The results obtained suggest that addition of sugar beet fiber decreased the expansion ration, increased bulk density, and decreased both brittleness and hardness values. Fiber addition caused significant changes in various properties of extruded products, but the finished product were acceptable by sensory testing results up to a level of 20%.

Karlovic and co-workers (2009) analyzed the texture, elasticity, and oil uptake of coating mixtures for deep-fried chicken meat. The authors compared textural qualities of coating mixtures containing 0.5%, 1.5% or 2.5% dietary fiber (sugar beet fiber (Fibrex[®]) or pectin (citrus) to a basic coating consisting of corn flour and rice starch. Oil uptake and texture properties were tested after frying the coated chicken in palm oil for five minutes at 180°C. Addition of pectin or sugar beet fiber to mixtures resulted in a significant decrease in oil uptake (up to 30%). Sugar beet fiber absorbed less oil than pectin. Water loss from the meat decreased with pectin or sugar beet fiber coatings than for samples without dietary fiber coating. Hardness of samples decreased up to 38% with coatings containing sugar beet fiber and 47.5% for samples with coatings containing pectin. They concluded that the addition of dietary fiber to coating formulations have a positive influence on textural properties of meat and oil uptake.

The Nutrition and Food Safety Research Institute, University of Barcelona. Study of the use of Fibrex[®] in beef patties. (2009)

The Nutrition and Food Safety Research Institute of the University of Barcelona (INSA·UB) conducted a study to investigate the effect of Fibrex[®] sugar beet fiber to reduce frying losses in beef patties. A standard beef-patty formulation was compared to patties with dosages of 0.8%, 1.2% and 1.5% Fibrex[®] 595 or a common wheat fiber. Physical and sensory analyses were employed to measure performance. The incorporation of Fibrex[®] resulted in a reduction in the loss of weight that the beef patties undergo during the frying process by more than 30% and resulted in a reduction of the shrinkage (length, width and diagonal distance) that the meat patties undergo during cooking. The patties incorporated with Fibrex[®] performed better than the ones incorporated with wheat fiber with regards to frying loss but there was no significant difference in shrinkage.

American Institute of Baking, Evaluation of Fibrex[®] in Reduced-Fat Cake Donuts. (1998)

The American Baking Institute (AIB) made a series of tests with the objective of testing the effectiveness of Fibrex[®] in reducing fat pick-up and extending shelf-life of fried cake donuts. Fibrex[®] was added to donut batters at the levels of 1.2, 1.8, and 2.4% based on flour quantity. The amount of water added to each batter was 3.3 times the weight of added Fibrex[®], to compensate for the water-binding properties of Fibrex[®]. AIB concluded that the addition of Fibrex[®], at all dosage levels, reduced the fat content and increased the moisture content of the fried donuts.

AIB, Evaluation of the Functionality of Fibrex[®] in Improving the Shelf life of White Pan Bread. (1990)

The AIB has conducted a study evaluating the functionality of Fibrex[®] 595 in improving the shelf-life of white pan bread. Fibrex[®] was added at levels 2.5 and 5% based on the flour quantity. AIB concluded that a seven-day old Fibrex[®]-containing bread had the crumb firmness of a four-day old control bread and that breads containing Fibrex[®] demonstrated a moister mouthfeel after storage. The optimum level of Fibrex[®] usage in white pan bread is between 2 to 3% based on flour weight.

Animal Studies

Klopfenstein (1990) reported that sugar beet fiber had potential as a dietary aid in the treatment of hypercholesterolemia and constipation. Eight groups of 10 male Wistar rats were fed casein-based diets containing 5% α cellulose, hard red winter wheat bran (course and fine) or sugar beet fiber (course and fine) for six weeks. At the end of six weeks, total serum cholesterol levels were lower in animals fed beet fiber than those on the cellulose diet. Animals fed the wheat bran diet had cholesterol levels intermediate between the animals fed cellulose and beet fiber. Serum triglyceride concentrations did not differ significantly among groups but rats fed sugar beet fiber had lower liver triglyceride concentrations than animals from the other groups. No differences were found in fecal water-holding capacity among rats fed wheat bran and sugar beet fiber, but feces of rats fed 5% cellulose had a significantly lower water-holding capacity.

Hagander et al. (1988a) also conducted some animal studies to support the metabolic responses reported in humans. The suspension of beet fiber bread was given to male Sprague-Dawley rats by oro-gastric intubation. The result was a lower blood glucose response than a control bread suspension at 15 and 30 minutes, but a similar insulin response. The authors suggest that this is due to an effect of beet fiber on the rate of carbohydrate absorption.

Alternatives

Other fiber products are available but have different technical and functional uses than Fibrex[®]. These are:

- JustFiber[™] (oat fiber), International Fiber Corp., US.
- Psillium, Kadam Exports Pvt. Ltd., (UK).
- Apple fiber, JRS, Germany.
- Oat fiber, Grain Millers, US.
- Soy fiber, Sun Opta, US.
- Pea fibre, Euringus, France.

12. Petition Justification Statement

Fibrex[®] is a natural fiber with unique qualities because of its balance of 1/3 soluble fiber and 2/3 insoluble fiber as well as its thermostable water holding capacity. The raw material is fresh sugar beet pulp, which is a co-product from the sugar production. Less than 5% of the total amount of beet pulp in Sweden is used for production of Fibrex[®].

Sugar industry structure and process

The latest reform of the sugar market regulation in the EU has resulted in a changed production structure, also in Sweden. The reform put a big pressure on price reduction and production efficiency, hence only the most efficient sugar factories remain after the reform. Kopingebro sugar factory in south Sweden, where the organic production took place earlier, was closed due to the EU reform (44% of the sugar factories in Europe were closed). The remaining sugar factory in Sweden, Ortofta, is 2.5 times bigger than the one in Kopingebro, and has a capacity to process 20 000 tons of sugar beet per day. The sugar production process is continuous, running 24h a day, seven days a week during a four month long harvesting period once a year in the fall. When starting up the sugar process, it takes up to seven days before the production is stable and efficient. It is not until this stage that the beet pulp is of high quality enough to serve as raw material for the Fibrex[®] product.

The process in a sugar factory is complicated by the fact that a lot of sugar juices are circulated back into the process to ensure maximum sugar yield. For organic products, 100% physical traceability is required, which further complicates organic production of sugar.

Cost and profitability of organic sugar

We estimate that the cost today to produce organic sugar would be at least 2-4 times higher than the cost for conventional sugar and this is not competitive in relation to the organic sugar that is available on the world market. This organic sugar is to date priced with a premium of only approx. 30% and is predominantly sourced from cane, not beet. Cane is grown in warmer climates, is more cost efficient as a source for sugar and accounts for 60% of global sugar production. Therefore, in the foreseeable future, organic sugar will not be produced in our area and as a result no organic raw material will be available for Fibrex[®] production.

A few years back, our company did have a limited production of organic sugar. The demand however was low and products never became profitable. Then the EU reform came, which cut the price level and the project was stopped in 2005.

Sugar beet fiber, Fibrex[®]

The factory producing Fibrex[®] is situated in the beet growing area of southern Sweden. The raw material, the beet pulp is separately selected and must also be fresh as it is rapidly undergoing a degradation process. A special steam drying process is used in the Fibrex[®] factory to achieve the right quality. This means that Fibrex[®] cannot be made from beet pulp which is dried at a sugar plant.

There is no cultivation of organic sugar beet in northern Europe. To the best of our knowledge there are no other producers of sugar beet fiber for human consumption anywhere else in the world.

In conclusion, even though there is a demand for organic Fibrex[®] and we would like to accommodate this, there is no organic raw material available for the production of organic sugar beet fiber in the foreseeable future.

13. Confidential Business Information (CBI) Statement

Provide a basis for any commercial confidential or trade secret information. A redacted copy without such information should be provided for FOI requests (*minus application tests in item 11*).

Appendices

1. Product Description – PD 228905-5.0EN Fibrex, November 22, 2010.
2. HACCP Plan on Fibrex[®] Production, v08-September 2009.
3. ISO Certifications, ISO 9001 and 14001, May 4, 2010; ISO 22000, April 2, 2009; OHSAS 18001:2008 Certification, March 14, 2010.
4. GRAS Panel Report, April 9, 1991.
5. HPB Letter, July 5, 1989.
6. KRAV Certification, December 13, 2010.
7. Kosher Certification, August 12, 2010; Halal Certification, December 1, 2010.
8. Ystad Kommun certification, January 13, 2011.
9. Fibrex[®] MSDS, GB/2.0, April 24, 2009.
10. References

PRODUCT DESCRIPTION - PD 228905-5.0EN

Fibrex

Valid from: November 22, 2010

Description

Sugar beet fibre

Ingredients

Sugar beet pulp

Physical/Chemical specifications

| | |
|------------------------|---------------------|
| Dry matter | approx 92 % |
| Water holding capacity | 3.5 - 4.0 g water/g |
| Particles <0.032 mm | Fibrex 575 |
| Particles <0.125 mm | Fibrex 595 |
| Particles <0.50 mm | Fibrex 600 |
| Particles <2.0 mm | Fibrex 608 |
| Particles 0.4-1.4 mm | Fibrex 610 |
| Particles 1.0-2.0 mm | Fibrex 615 |
| Coarse, not milled | Fibrex 620 |
| Flake | Fibrex 630 |

Microbiological specifications

Analysis according to NMKL methods:

| | |
|-------------------------|--------------|
| Total plate count | < 1000 CFU/g |
| Yeasts | < 100 CFU/g |
| Moulds | < 100 CFU/g |
| Enterobacteriaceae | < 10 CFU/g |
| E.coli | negative |
| Salmonella | negative |
| Bacillus cereus | < 100 CFU/g |
| Clostridium perfringens | < 10 CFU/g |

Nutritional data

| | |
|-----------------------|----------------------------------|
| per 100 g | |
| Energy | 800 / 200 kJ / kcal ¹ |
| Protein | 8 g |
| Carbohydrate | 5.5 g |
| of which sugars | 5.5 g |
| Fat | 1 g |
| of which saturated | < 1 g |
| Fibre | 67 g ² |
| of which | |
| - Hemicellulose (42%) | |
| - Cellulose (28%) | |
| - Pectin (27%) | |
| - Lignin (3%) | |
| Minerals | 4 g |
| Sodium | 0.05 g |

¹ The energy value is corrected according to Commission Directive 2008/100/EC and Codex Alimentarius.

² According to AOAC 45.4.07/NMKL 129. Some hemicelluloses, particularly arabans are exceptionally soluble in alcohol and therefore not recovered in the fibre analysis. However, their degree of polymerisation is well above 10 and they are therefore fibre according to current Codex Alimentarius and EU definitions. Taken this into account, the total fibre content is approx. 73%.

Fibrex is a product of nature, with natural variations according to place of growth of the sugar beet, weather conditions etc. The specifications parameters on composition can therefore by definition not be binding, but must be seen as a guideline.

Storage recommendations

Shelf life in unbroken packaging: 8 years

Keep dry, relative humidity < 65 %

PRODUCT DESCRIPTION - PD 228905-5.0EN

Fibrex

Valid from: November 22, 2010

Packaging

57522 / 22 kg, 660 kg/pallet
59522 / 22 kg, 660 kg/pallet
59422 / 22 kg, 990 kg/pallet
59500 / Big bag
60022 / 22 kg, 660 kg/pallet
60122 / 22 kg, 924 kg/pallet
60822 / 22 kg, 660 kg/pallet
61022 / 22 kg, 660 kg/pallet
61522 / 22 kg, 660 kg/pallet
62014 / 14 kg, 420 kg/pallet
63016 / 16 kg, 480 kg/pallet

Fibrex is delivered on Europallets in 2-sheet Semiclupac or Duplex bags, (1x90g/m² + 1x80g/m²).

Produced in

Sweden

Kosher information

The product is Kosher. Certificate is available on request.

Halal information

The product is Halal. Certificate is available on request.

GMO information

The product does not contain or consist of GMOs and is not produced from or contain ingredients produced from GMOs as defined in Regulations (EC) No 1829/2003 and 1830/2003.

Allergen information

The product does not contain any allergens as listed in Directives 2003/89/EC (Annex IIIa), 2005/26/EC (Annex) and 2006/142/EC (Article 1).

Additional information

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Nordic Sugar
Member of Nordzucker Group

HACCP plan

on Fibrex® production



Content

1. Objectives
2. The method
3. Identification of CCPs and POAs
4. Verification process
5. Documentation

1. Objectives

The objectives with this booklet are to

1. Explain and introduce Nordic Sugar's HACCP work to customers and authorities
2. Exchange general experiences with HACCP plans throughout the organisation
3. Create a common understanding of the HACCP method (calibration between factories)

The current HACCP plan addresses product safety associated with production of Fibrex®

2. The method

The HACCP plans at Nordic Sugar are based on the GMP+ method (International Feed Ingredients Standard - IFIS) and the international food safety standard ISO 22000. We have taken every identified hazard in the whole process chain and evaluated them with regard to three basic steps in this method (the fourth step below is the verification of the system). This procedure has clarified where the hazard should be controlled, how the hazard should be controlled and what verification procedures are necessary.

1. Identification of chemical, physical, biological and allergenic hazards in each step of the process chain.
2. In a risk assessment (2.2.) the severity and probability of each identified hazard are combined to determine the risk class and the type of control method necessary.

3. By using the decision tree (2.3.) we have identified where the hazards should be controlled along the production chain. Based on the risk classes the decision tree is used to determine whether a given process step is a critical control point (CCP), a point of attention (POA/GMP) or just a periodic measure (PM).

4. Apart from product specifications, process diagrams, risk analysis tables and summary tables, also activities towards verification of the HACCP system are documented. These activities are e.g. audits, sampling and analysis of products, analysis of deviations and customer complaints.

2.1. Severity and probability

The severity of every possible hazard in the production chain has been estimated by the Nordic Sugar HACCP Reference Group independent of the current production process. The probability of each hazard is very closely associated with the processes and the current process equipment. The probability has therefore been determined by the local HACCP group at the factory.

2.2. Risk assessment matrix

| Probability* | Severity | | |
|--------------|-------------------------------|-------------------------------|-------------------------------|
| | Small | Medium | Great |
| Great | 3 POA Specific measures | 4 CCP Critical measures | 4 CCP Critical measures |
| Medium | 2 PM General measures | 3 POA Specific measures | 4 CCP Critical measures |
| Small | 1 No measures | 2 PM General measures | 3 POA Specific measures |

* Refers to the probability of the hazard being present in the end product e.g. at the moment of consumption.

2.3. Decision tree

Where will the hazard be controlled?

- Q1: Are there identified hazards present which have a harmful effect on the safety of the product and/or can the hazard exist or increase to unacceptable levels?
Yes → Q2, No → stop!
- Q2: Which type of control measures are necessary according to the risk assessment?
Critical measures (class 4) → Q3, Specific measures (class 3) → include measures as POA and in verification procedures,
General measures (class 2) → include measures as PM and in verification procedures or no measures (class 1) → stop!
- Q3: Are the critical control measures referred to present?
Yes → Q4, No → Modify the process or product and start again at Q1.
- Q4: Has this process step been specifically developed to eliminate the risk or reduce it to an acceptable level? No → Q5, Yes → CCP!
- Q5: Will the risk be eliminated in a subsequent process step or will it be reduced to an acceptable level? Yes → Stop, No → CCP!

3. Identification of CCPs and POAs

The way Nordic Sugar differs between a CCP and a POA

CCP

- A high risk step, which is likely to get out of control
- Critical (and possible/applicable) control measures are needed in order to prevent, eliminate or reduce food & feed safety hazards to an acceptable level
- If measures are out of control the corrective actions must include isolation of product batch, retesting, decontamination or destruction
- The hazard is not eliminated or reduced to an acceptable level at a later stage in the process
- If not in control the end product constitutes a serious health risk

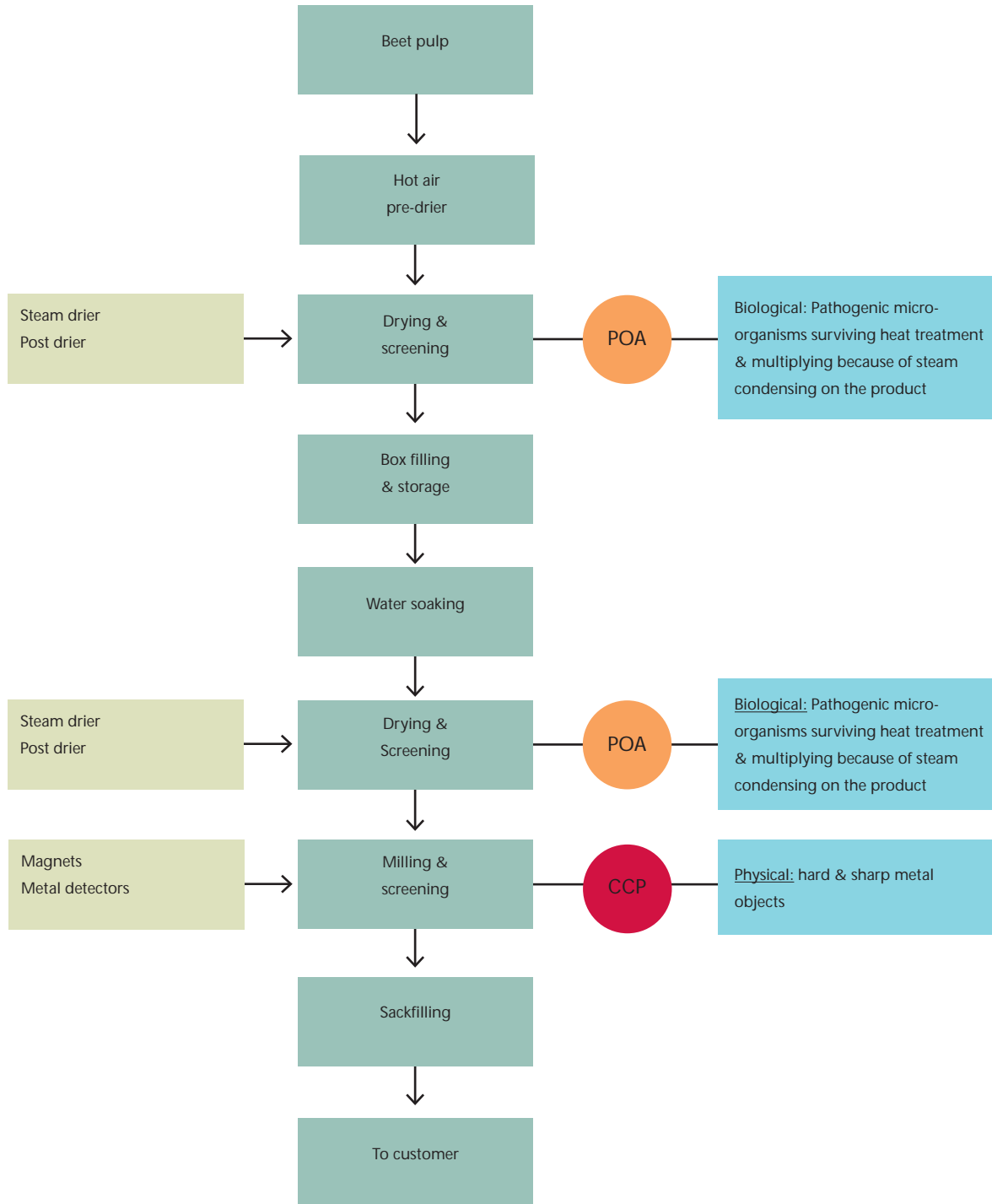
POA

- A moderate risk step
- Specific control measures essential to control the likelihood of introduction, contamination and/or proliferation of food & feed safety hazards
- The hazard may be reduced at a later stage in the process
- If measures are out of control the corrective actions include reevaluating procedure and/or checking equipment

*In total two POAs and one CCP have been identified for the production of Fibrex.
(see 3.1. Fibrex production process).*

3.1. Fibrex production process

General process steps and description of CCPs and POAs



See description of hazards, control measures, action limits and corrective actions for these process steps in table 3.2. and 3.3.

3.2. Hazard analysis table (risk evaluation)

| Processing step | | Potential Hazards | Control measures |
|-----------------|--------------------|---|--|
| | | introduced, controlled or enhanced at this step | applied at this step to prevent/reduce/eliminate the hazard. |
| 1 | Drying & screening | (B) Mycotoxin producing fungi or pathogenic bacteria surviving heat treatment. Multiplication of these microorganisms later in the process if steam condensing on the product | Processing control Right temperature & pressure |
| 2 | Drying & screening | (B) Mycotoxin producing fungi or pathogenic bacteria surviving heat treatment. Multiplication of these microorganisms later in the process if steam condensing on the product | Processing control Right temperature & pressure |
| 3 | Screening | (P) Presence of hard & sharp metal objects 3 - 25 mm. | Continuous screening with magnets & metal detectors |

* Refers to the questions in the Decision tree (see 2.3. Decision tree).

B=Biological

C=Chemical

P=Physical

SM=Specific measures

CM=Critical measures

Is this step a critical control point?

Evaluation of hazard

Severity and probability in the risk assessment matrix gives the risk class

| | Decision tree questions 1 / 2 / 3 / 4 / 5* | CCP/POA/PM Comm. / Ref. |
|--------------------|---|---|
| Great x small = 3 | Yes / SM → POA | Drying (steam & post drier) is a POA for microbiological hazards |
| Great x small = 3 | Yes / SM → POA | Drying (steam & post drier) is a POA for microbiological hazards |
| Medium x great = 4 | Yes / CM / Yes / Yes → CCP | Screening with magnets & metal-detectors is a CCP for metal hazards |

3.3 HACCP Summary table

| CCP or POA | Process step | Hazard to control | Control Method | Frequency |
|------------|--------------------|--|--|-------------------------------------|
| 1 POA | Drying & screening | I. Survival of pathogenic microorganisms II. Mycotoxin production | I. Temperature & pressure control II. Dry matter (DM) content | I. Every 2 hour II. Every 2 hour |
| 2 POA | Drying & screening | I. Survival of pathogenic microorganisms II. Mycotoxin production | I. Temperature & pressure control II. Dry matter (DM) content | I. Every 2 hour II. Every 2 hour |
| 3 CCP | Screening | Presence of hard & sharp metal objects | Specific method to check the magnet or metal detector efficiency (test objects identified or caught) | Every shift |

Action limit

Corrective action

- when action limit is exceeded

Responsible

Reference

I. According to norm.

II. DM < 87%

I. Rework

II. Rework

Drier
operator

Local instruction for activities
covering this area

I. According to norm.

II. DM < 87%

I. Rework

II. Rework

Drier
operator

Local instruction for activities
covering this area

Target limit: The test objects are being identified
in product flow

Action limit: Test objects not identified by
metal detector in the product stream

Rework

Drier
operator

Local instruction for activities
covering this area

4. Verification process

Sustaining a high quality and secure HACCP system requires continuous evaluation and review of the system.

A Nordic Sugar review of the risk analysis and verification of the HACCP plans consists of the following elements:

- Trend analyses of monitoring of POAs and or CCPs e.g. how often do we identify broken sieves

- Sampling and analysis of end products as a part of our quality program.
- Evaluation of complaints and/or emergencies reported to Nordic Sugar.
- Internal and external audits.

Audits -with focus on e.g. hygiene and HACCP are performed by internal and external parties.

These elements are used to verify the current HACCP plans at the different production sites. The verification is done whenever necessary and at least once a year.



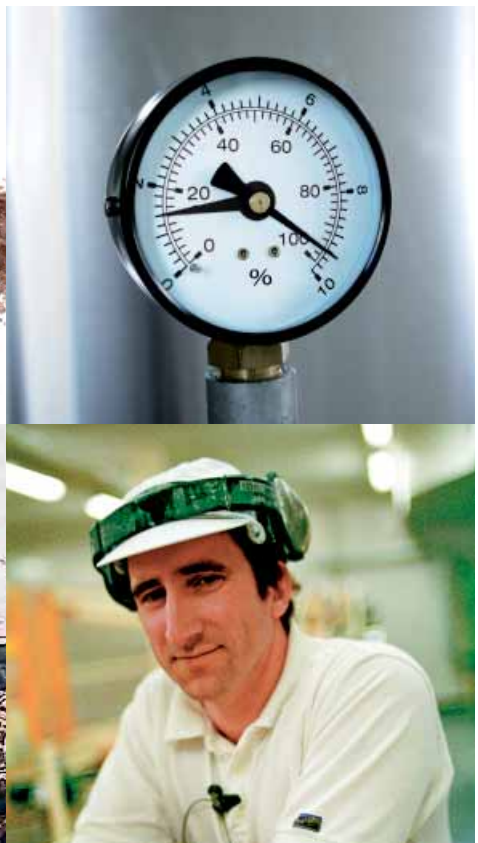
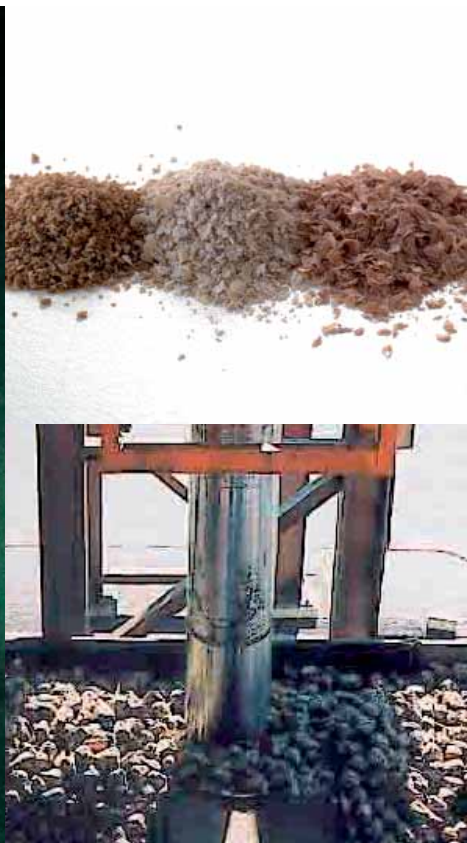
5. Documentation

In the description of our HACCP system the following documents are included:

- HACCP team documents (members and areas of expertise)
- Flowcharts i.e. process diagrams
- Hazard analysis tables
- HACCP summary tables (comprising exclusively POAs and CCPs)

These documents are handled in the document management system (DMS) for each factory. The product safety manager located at the production site supports the management and updates the documentation. Deviations from criteria set for CCPs/ POAs are reported and registered in a Deviation Database and/or the Laboratory Information Management

System (LIMS) or Production Information Management System (PIMS). Deviations identified at the factories (at e.g. audits) are reported and communicated in a Deviation Database. Customer complaints are registered in a similar database, "Sugar Complaints for sugar, Fibrex and animal feed products".





Nordic Sugar
Member of Nordzucker Group

Nordic Sugar A/S | Langebrogade 1 | PO Box 2100 | 1014 Copenhagen K | Denmark | +45 3266 25 00
www.nordicsugar.com



DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 73886-2010-AQ-DEN-RvA / Rev. 1

This is to certify that

NORDIC SUGAR A/S

Langebrogade 1, PO 2100, DK-1014 Copenhagen K, Denmark

and the sites as mentioned in the appendix accompanying this certificate.

has been found to conform to the Management System Standard:

ISO 9001:2008

This Certificate is valid for the following product or service ranges:

Development, Production and Sales of Sugar Products, Animal Feed and Nutritional Fibers.

Initial Certification date:

January 23rd, 2007

This Certificate is valid until:

January 23rd, 2013

The audit has been performed under the supervision of:

Vibeke Bagger
Lead Auditor



Place and date:

Barendrecht, May 4th, 2010

for the Accredited Unit:
DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS

Ron J. Meijer
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.



DET NORSKE VERITAS

APPENDIX TO CERTIFICATE

This Appendix refers to Certificate No. 73886-2010-AQ-DEN-RvA / Rev. 1

NORDIC SUGAR A/S

locations included in the certification are as follows:

Nordic Sugar A/S, Langebrogade 1, København K, DK-1014, Denmark

Nordic Sugar Nakskov, Tietgensvej 1, Nakskov, DK-4900, Denmark
incl. Assens (storage), Sdr. Ringvej 21, Assens, DK-5610, Denmark

Nordic Sugar Nykøbing, Østerbrogade 2, Nykøbing F, DK-4800, Denmark
incl. Saksøbing (storage), Nykøbingvej 76, Saksøbing, DK-4990, Denmark,
Stege (storage), Kostervej 2, Lendemark, Stege, DK-4780, Denmark and
Gørlev (storage), Algade 2, Gørlev, DK-4281, Denmark

Nordic Sugar Örtofta, Eslöv, SE-241 93, Sweden
incl. Köpingsbro, Stationsvägen 5, Köpingsbro, SE-270 22, Sweden

Nordic Sugar Arlöv, Sockerbruksgatan 4, Arlöv, SE-232 21, Sweden

Finnsugar Ltd. (Suomen Sokeri Oy), Sokeritehtaantie 20, FI-02460 Kantvik, Finland

Sucros Ltd. (Sucros Oy), Maakunnantie 4, FI-27820 Säskylä, Finland

Nordic Sugar Kedainiai, Pramonės g. 6, Kedainiai, LT-57500, Lithuania
incl. Panevėžys, Imonių g. 22, Panevėžys, LT-35101, Lithuania

Initial Certification date:

January 23rd, 2007

This Certificate is valid until:

January 23rd, 2013

The audit has been performed under the supervision of:

Vibeke Bagger
Lead Auditor



Place and date:

Barendrecht, May 4th, 2010

for the Accredited Unit:
DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS

Ron J. Meijer
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.



DNV

DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 73887-2010-AE-DEN-RvA / Rev. 1

This is to certify that

NORDIC SUGAR A/S

Langebrogade 1, PO 2100, DK-1014 Copenhagen K, Denmark

and the sites as mentioned in the appendix accompanying this certificate.

has been found to conform to the Management System Standard:

ISO 14001:2004

This Certificate is valid for the following product or service ranges:

Development, Production and Sales of Sugar Products, Animal Feed and Nutritional Fibers.

Initial Certification date:

January 23rd, 2007

This Certificate is valid until:

January 23rd, 2013

The audit has been performed under the supervision of:

Søren Hald

Lead Auditor



MGMT. SYS.
RvA C 024

Place and date:

Barendrecht, May 4th, 2010

for the Accredited Unit:
DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS

Ron J. Meijer

Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.



DET NORSKE VERITAS

APPENDIX TO CERTIFICATE

This Appendix refers to Certificate No. 73887-2010-AE-DEN-RvA / Rev. 1

NORDIC SUGAR A/S

locations included in the certification are as follows:

Nordic Sugar A/S, Langebrogade 1, København K, DK-1014, Denmark

Nordic Sugar Nakskov, Tietgensvej 1, Nakskov, DK-4900, Denmark
incl. Assens (storage), Sdr. Ringvej 21, Assens, DK-5610, Denmark

Nordic Sugar Nykøbing, Østerbrogade 2, Nykøbing F, DK-4800, Denmark
incl. Sakskøbing (storage), Nykøbingvej 76, Sakskøbing, DK-4990, Denmark,
Stege (storage), Kostervej 2, Lendemark, Stege, DK-4780, Denmark and
Gørlev (storage), Algade 2, Gørlev, DK-4281, Denmark

Nordic Sugar Öertofta, Eslöv, SE-241 93, Sweden
incl. Köpingsbro, Stationsvägen 5, Köpingsbro, SE-270 22, Sweden

Nordic Sugar Arlöv, Sockerbruksgatan 4, Arlöv, SE-232 21, Sweden

Finnsugar Ltd. (Suomen Sokeri Oy), Sokeritehtaantie 20, FI-02460 Kantvik, Finland

Sucros Ltd. (Sucros Oy), Maakunnantie 4, FI-27820 Säskylä, Finland

Nordic Sugar Kedainiai, Pramonės g. 6, Kedainiai, LT-57500, Lithuania
incl. Panevėžys, Imonių g. 22, Panevėžys, LT-35101, Lithuania

Initial Certification date:

January 23rd, 2007

This Certificate is valid until:

January 23rd, 2013

The audit has been performed under the supervision of:

Søren Hald
Lead Auditor

Place and date:

Barendrecht, May 4th, 2010

for the Accredited Unit:

DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS



Ron J. Meijer
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.



DET NORSKE VERITAS

FOOD SAFETY SYSTEM CERTIFICATE

Certificate No. 21957-2008-AFSMS-DEN-RvA / Rev. 1

This is to certify that

NORDIC SUGAR A/S

Langebrogade 1, PO Box 2100, DK-1014 Copenhagen K, Denmark
and the sites as mentioned in the appendix accompanying this certificate

Is evaluated and approved according to the Food Safety Standard:

ISO 22000:2005

This Certificate is valid for the following product or service ranges:

**Development, production and sales of sugar products, feed,
nutritional fiber products and sweeteners.**

Initial Certification date:

April 15th, 2008

This Certificate is valid until:

April 15th, 2011

*The audit has been performed under the
supervision of:*

Vibeke Bagger
Lead Auditor



Place and date:

Barendrecht, April 2nd, 2009

for the Accredited Unit:
DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS

Ron J. Meijer
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

DET NORSKE VERITAS CERTIFICATION B.V. Zwolseweg 1, 2994 LB Barendrecht, The Netherlands, TEL: +31 10 2922 688 - www.dnv.com / www.dnv.nl



DET NORSKE VERITAS

APPENDIX TO CERTIFICATE

This Appendix refers to Certificate No. 21957-2008-AFSMS-DEN-RvA / Rev. 1

NORDIC SUGAR A/S

locations included in the certification are as follows:

NORDIC SUGAR A/S, Langebrogade 1, PO Box 2100, DK-1014 Copenhagen K

NORDIC SUGAR Nakskov, Tietgensvej 1, DK-4900 Nakskov
incl. Assens, Sdr Ringvej 21, DK-5610 Assens (storage)

NORDIC SUGAR Örtofta, SE-241 93, Eslöv
incl. Köpingsbro, Stationsvägen 5, SE-270 22 Köpingsbro

NORDIC SUGAR Arlöv, Sockerbruksgatan 2, Box 32, SE-232 21 Arlöv

SUCROS Oy, Säkyllän tehdas, Maakunnantie 4, FIN-27820 Säkyllä

NORDIC SUGAR Kedainiai, Pramonės g. 6, LT-5030 Kedainiai
incl. Panevėzys, Imonių g. 22, LT-5319 Panevėzys

Initial Certification date:

April 15th, 2008

This Certificate is valid until:

April 15th, 2011

The audit has been performed under the supervision of:

Vibeke Bagger
Lead Auditor



Place and date:

Barendrecht, April 2nd, 2009

for the Accredited Unit:
DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS

Ron J. Meijer
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.



DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 74948CC1-2010-AHSO-DEN-DANAK

This is to certify that

Nordic Sugar A/S

Langebrogade 1, København K, DK-1014, Denmark

Has been found to conform to the Safety Management System Standard

DS/OHSAS 18001:2008

This Certificate is valid for the following product or service ranges:

Development, Production and Sales of Sugar Products, Animal Feed and Nutritional Fibers,

This certificate is valid until:

2013-03-31

Place and date:

Hellerup, 2010-04-14

for the Certification Dept. in:
DET NORSKE VERITAS, DANMARK A/S
CERTIFICATION



Certification audit has been performed by

Lotte Faber Klausen
Lead Auditor

Rikke Topp Petersen
for Certification Manager

Lack of fulfilment of conditions as set out in the Contract may render this certificate invalid.



DET NORSKE VERITAS

APPENDIX TO CERTIFICATE

This Appendix refers to Certificate No. 74948CC1-2010-AHSO-DEN-DANAK

Nordic Sugar A/S

Locations included in the certification are as follows:

Nordic Sugar A/S, Langebrogade 1, København K, DK-1014, Denmark P. No: 1.003.073.414

Nordic Sugar Nakskov, Tietgensvej 1, Nakskov, DK-4900, Denmark P. No: 1.003.073.359
incl. Assens (storage), Sdr. Ringvej 21, Assens, DK-5610, Denmark P. No: 1.003.073.426

Nordic Sugar Örtofta, Eslöv, SE-241 93, Sweden
incl. Köpingsbro, Stationsvägen 5, Köpingsbro, SE-270 22, Sweden
Nordic Sugar Arlöv, Sockerbruksgatan 4, Arlöv, SE-232 21, Sweden

Nordic Sugar Kedainiai, Pramonės g. 6, Kedainiai, LT-57500, Lithuania
incl. Panevėzys, Imonių g. 22, Panevėzys, LT-35101, Lithuania

This certificate is valid until:

2013-03-31

Place and date:

Hellerup, 2010-04-14

for the Certification Dept. in:
DET NORSKE VERITAS, DANMARK A/S
CERTIFICATION

Certification audit has been performed by

Lotte Faber Klausen
Lead Auditor

Rikke Topp Petersen
for Certification Manager

Lack of fulfilment of conditions as set out in the Contract may render this certificate invalid.

GRAS PANEL MEETING

April 9, 1991

Fibrex[®], Sugar Beet Fiber

The undersigned members of the GRAS Expert Panel (The Panel) state as follows:

1. Delta Fibre Foods requested the Panel to examine the data gathered about the Product known as "beet fiber," "dietary plant fiber," or "sugar beet fiber" (known by the trade name Fibrex[®]) so that it could render an opinion on whether the Product would be considered by experts in food technology, food safety, and nutrition to be generally recognized as safe for its continued use as a dietary fiber in foods.
2. The Panel members' qualifications in the fields relevant to such a determination are noted in their curricula vitae attached hereto.
3. During the course of its review, the Panel examined certain documents provided by Delta Fibre Foods concerning the history of use of sugar beets, both as animal and human food.
4. The Panel recognizes that the red beet and the sugar beet are of the same species and that the sugar beet was grown as a garden vegetable and fodder for centuries before it was used as a commercial source of sucrose (sugar).
5. The Panel recognizes that the fibers from both beets have the same percentage of soluble fiber content and that the sugar beet fibers are made up of carbohydrates ordinarily found in other vegetable fibers.
6. The Panel recognizes that the manufacturing process used to separate the Product from the sugar is one that has been used commercially since the 1900s and that the remaining fiber is further washed with water, dried, and mechanically ground and not modified in any other way.
7. The Panel is aware that many countries in Europe recognize the Product as a dietary fiber for use in food and Canada recognizes the Product specifically for use as a dietary fiber in bread.
8. The Panel is aware that Delta Fibre Foods plans to use the Product in baked goods (1 - 7%), cereals and snacks (5 - 7%), gravies and sauces (2 - 5%), drinks (3 - 5%), batters and breadings (3 - 5%), soups (3 - 5%), and pasta (1 - 5%).

GRAS Panel Meeting
Page Two

9. As a result of the review, this GRAS Expert Panel is confident that the Product is safe for its intended use. The Panel notes that:

- The source of the ingredient, the sugar beet, has a long history of food and fodder use.
- The process used in extracting the Product from the sugar beet does not change its composition.
- The safety of the Product is demonstrated by the long-standing safe use of the vegetable source, including its fiber, both as human food and animal feed.

David Kritchevsky
David Kritchevsky, Ph.D., Chairman

3 May 91
Date

Charles E. Elson
Charles E. Elson, Ph.D.

May 2, 1991
Date

Theodore M. Farber
Theodore Farber, Ph.D., DABT.

May 1, 1991
Date

Janet L. Greger
Janet L. Greger, Ph.D.

May 2, 1991
Date

Dennis T. Gordon
Dennis T. Gordon, Ph.D.

April 29, 1991
Date

Judith A. Marlett
Judith A. Marlett, Ph.D., R.D.

May 22, 1991
Date

Lloyd W. Norman
Lloyd W. Norman, Consultant

Apr. 19, 1991
Date

Earl Shrago
Earl Shrago, MD.

May 2, 1991
Date

Aranea Certifiering AB (SE-EKO-01) is accredited by
SWEDAC according to EN45011

Nordic Sugar AB
Langebrogade 1
PO Box 2100
DK-1014 Copenhagen K

Client ID:
19339078-8

Certificate for Organic Production

The production at above operator meets the requirements laid down in
Council Regulation (EC) No 834/2007 and KRAV Standards

The operator is responsible for that only products produced in accordance
with KRAV standard are labelled and advertised as KRAV certified
organic.

The operator has certified activities at sites below

| Production Site | | Date |
|-----------------|--|------------|
| Nordic Sugar AB | 232 21 Arlöv | 08-09-1997 |
| Scope | Production of granulated sugar, cube sugar and syrup | |

The certificate is valid until 13 of April 2012 under the condition that the client is
continuously certified according to the Council regulation (EC) no 834/2007 and
KRAV standards through Aranea Certifiering AB

Uppsala 13 of December 2010



Bengt-Erik Jansson
Business Area Manager Certification



Appendix to certificate for organic production

Nordic Sugar AB
Langebrogade 1
PO Box 2100
DK-1014 Copenhagen K

Client ID:
19339078-8

Following product are registered under the scope of certification

| Product no | Article no | Product | Brand | Country of processing | Factory |
|------------|------------|---------------------------------------|--------------|-----------------------|------------|
| 33484 | 46109 | Organic Yellow Syrup, 25kg | Nordic Sugar | Sweden | Arlöv |
| 38996 | 46120 | Organic Yellow Syrup, 700kg | Nordic Sugar | Sweden | Arlöv |
| 23691 | 46108 | Organic White Syrup, 25kg | Nordic Sugar | Sweden | Arlöv |
| 30495 | 43208 | Organic Icing Sugar PS, 25kg | Nordic Sugar | Denmark | Nykøping |
| 41449 | 40075 | Organic Granulated Cane Sugar, 25kg | Nordic Sugar | Sweden | Arlöv |
| 37744 | 40074 | Organic Granulated Cane Sugar, 400kg | Nordic Sugar | Sweden | Arlöv |
| 37775 | 40073 | Organic Granulated Cane Sugar, 1000kg | Nordic Sugar | Sweden | Arlöv |
| 37776 | 40072 | Organic Granulated Cane Sugar, Bulk | Nordic Sugar | Sweden | Arlöv |
| 23692 | 89522, 80C | Organic Fibrex | Nordic Sugar | Sweden | Köpingebro |
| 39155 | 46123 | Organic Liquid Sugar 62%, Bulk | Nordic Sugar | Sweden | Arlöv |
| 39344 | 46127 | Organic Liquid Sugar 65%, Bulk | Nordic Sugar | Sweden | Arlöv |
| 39156 | 46124 | Organic Liquid Sugar 67%, Bulk | Nordic Sugar | Sweden | Arlöv |
| 39157 | 46113 | Organic Liquid Sugar 67%, 1300kg | Nordic Sugar | Sweden | Arlöv |
| 39879 | 46130 | Organic Dark Brown Syrup, 25kg | Nordic Sugar | Sweden | Arlöv |
| 39880 | 46131 | Organic Dark Brown Syrup, 700kg | Nordic Sugar | Sweden | Arlöv |
| 7684 | 46439 | Organic Golden Syrup, 750g | Dansukker | Sweden | Arlöv |
| 33491 | 41210 | Organic Granulated Sugar, 1kg | Dansukker | Denmark | Nykøping |



Nordic Sugar AB
Langebrogade 1
PO Box 2100
DK-1014 Copenhagen K

Client ID:
19339078-8

| Product no | Article no | Product | Brand | Country of processing | Factory |
|------------|------------|---|--------------|-----------------------|----------|
| 30494 | 43202 | Organic Icing Sugar PS, 500g | Dansukker | Denmark | Nykøping |
| 7683 | 42213 | Organic White Sugar Cubes, 1kg | Dansukker | Sweden | Arlöv |
| 41147 | 40094 | Organic Cane Sugar FLO-Fairtrade, 25kg | Nordic Sugar | Sweden | Arlöv |
| 42485 | 42514 | Small Organic Cane Sugar Cubes, Fairtrade | Dansukker | Sweden | Arlöv |
| 41149 | 41245 | Organic Cane Sugar Fairtrade, 1kg | Dansukker | Denmark | Nykøping |

Uppsala 13 of December 2010



Bengt-Erik Jansson
Business Area Manager Certifiering





Health and Welfare
Canada

Santé et Bien-être social
Canada

Health Protection
Branch

Direction générale de la
protection de la santé

Bureau of Nutritional Sciences
Food Directorate
Tunney's Pasture
Ottawa, Ontario
K1A 0L2

July 5, 1989

Mr. K.V. Galland
Canadian Fibre Foods Inc.
1530-1176 West Georgia St.
VANCOUVER, British Columbia
V6E 4A2

Dear Mr. Galland:

This in reference to your submission regarding the use of FIBREX sugar beet fibre as a dietary fibre ingredient in foods.

We have reviewed all the information provided by you, and can now confirm that we would have no objection to the use of FIBREX sugar beet fibre as a source of dietary fibre in foods, provided that, as previously discussed, the following recommendations are followed:

1. It should be incorporated into products similar to those tested, and at similar levels and particle sizes to those of products tested for physiological efficacy.
2. Based on the data provided in your letter of May 9, 1989 and a maximum potential use level of FIBREX of 7% in bread and other bakery products, the lead and cadmium levels in FIBREX are not considered to pose a hazard to health. You mentioned that in order to keep lead and cadmium levels low, the fines are removed from FIBREX during production. Please ensure that this procedure and the specifications cited above are consistently maintained.

.../2

Canada 

0010991

3. With respect to the chemical analysis, please note that, in order to satisfy the requirements of Section B.15.002 of the Food and Drug Regulations, the total content of each agricultural chemical and its derivatives may not exceed 0.1 ppm.
4. The energy value of dietary fibre sources, including FIBREX, must be included in the calculation of the energy value of foods containing them. The Branch's position in this regard are set out in the Guidelines on Nutrition Labelling.
5. With regard to finely ground (particle size of less than 0.125 mm) fibre sources, we should point out that since we have not had the opportunity to evaluate results of safety and efficacy studies, e.g. laxation studies, we are not yet in a position to comment on their acceptability in foods. Further efficacy data would be required, therefore, to comment on the acceptability of all very finely ground (or microground) fibre sources, including FIBREX products with particle sizes of less than 0.125 mm.
6. The use of FIBREX in extruded products would require demonstration of efficacy, since the extrusion process could significantly alter the fibre properties (as discussed at our meeting on June 6, 1988).
7. With respect to the promotional material for manufacturers, we have the following comments: At this time, claims to the effect that FIBREX will lower blood sugar content after meals or reduce blood cholesterol may not be made, since these claims would bring FIBREX within the definition of a drug for purposes of the Food and Drugs Act and are unacceptable for foods. (We would, however, have no objection to the listing of published studies about the effects of FIBREX). Descriptions relating fibre in food to diseases such as gallstones and cancer, included in the "general information about food fibre and FIBREX", are not acceptable for a food. The differential method is not considered acceptable for dietary fibre analysis. Information Letter No. 736 lists those methods considered acceptable e.g. Prosky et al., 1985 or equivalent (Asp et al, 1983).

.../3



0011001

Comparative claims, e.g. "more food fibre than wheat bran", would have to be supported by efficacy studies comparing the two products. We would refer you to Section 21 of Part C of the Guide for Food Manufacturers and Advertisers, published by the Department of Consumer and Corporate Affairs, for a more detailed discussion of claims for dietary fibre.

As research on the properties and physiological efficacy of FIBREX progresses, we would be pleased to evaluate new data. Please do not hesitate to call us if you have further questions at this time.

Yours truly,



M.C. Cheney, Ph.D
Chief

Nutrition Evaluation Division

(X)

0011011



**KOSHER
CERTIFICATION**

Rabbi Don Yoel Levy
Kashruth Administrator

KOSHER CERTIFICATE

Nordic Sugar Köpingebro
Stationsvägen 5
Köpingebro, SE-270 22 SWEDEN

KC# 1829436 - 1
2 Elul, 5770
August 12, 2010

The following products sold by Nordic Sugar A/S are certified Kosher with the listed restrictions.

| Name | K-ID | Status | Restriction | Size |
|--------|----------|--------|-------------|------|
| Fibrex | FTV-KKQJ | Pareve | Passover | NONE |

This certificate is VALID UNTIL August 31, 2011



Verify authenticity by entering K-ID at
www.digitalkosher.com

11.8.11 / 3

RABBI DON YOEL LEVY, Kashruth Administrator

HALAL CERTIFICATE

for
Nordic Sugar A/S

Langebrogade 1
1014 Copenhagen K
Denmark



The *Islamic Centre Hamburg* hereby declare that the products

FIBREX and FIPEC
(made from extracted beets)

has been produced in

Nordic Sugar, Köpingsbro Sockerbruk, Sweden

are manufactured with ingredients and methods
in accordance with the Islamic Law.

Therefore the named product is suitable for consumption by
all Muslims in the world

Expiry / Renewal Date : December 15th, 2011

Date : December 01st, 2010 Signature :

Islamisches Zentrum Hamburg e.V. *Ramzani*
Schöne Aussicht 36
22085 Hamburg
Germany





Ystad-Österlenregionens
miljöförbund

Certificate
2011-01-13

2011.0195.LIAL

Carina Barthel
Food Inspector
0417-57 35 23
carina.barthel@ystadosterlenmiljo.se

CERTIFICATE

FIBREX, a sugar beet based foodstuff high in fibre is manufactured at Köpingebro, Sweden, on premises approved sanitary fit for production of dietary fibre for human consumption by the National Food Administration on December 21st 1987.

The internal control of the finished food product FIBREX includes analysis of dry substance, total microbiological status, mould, yeast, water holding capacity, screening curve, density, volumeweight, colour, sand content, dietary fibre, pectin, crude protein, taste and smell (through a test panel). External analysis are made on minerals, sugar, crude fat, total microbiological status, mould, yeast, salmonella and a number of other microorganisms.

Nordic Sugar AB, FIBREX, is granted the right to produce the dietary fibre, FIBREX, for human consumption.

Environmental union of the Ystad and Österlenregion

Tomelilla January 13 th 2011

Carina Barthel
Food Inspector

Ystad-Österlenregionens miljöförbund
Östra Utfartsvägen 2
273 36 TOMELILLA



SAFETY DATA SHEET

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Avoid inhalation of dust. Use work methods which minimise dust production. High dust level: Take precautionary measures against static discharges. Avoid smoking and use of open fire. For personal protection, see section 8.

Environmental precautions: Avoid spreading dust or contaminated materials.

Methods for cleaning up: High dust level Use spark-proof tools and explosion-proof equipment. Dampen spillage with water. For waste disposal, see section 13.

7. HANDLING AND STORAGE

Safe handling advice: Avoid inhalation of dust. Observe good chemical hygiene practices.

Technical measures: Use work methods which minimise dust production. High dust level: Risk of dust explosion: Use spark-proof tools and explosion-proof equipment. Avoid smoking and use of open fire. Secure electric equipment against sparking.

Technical precautions: During dust-raising work: Local exhaust is recommended.

Technical measures for safe storage: Comply with the regulations on storage of materials presenting a risk of dust explosions.

Storage conditions: Store in closed original container in a dry place. Store away from water and humidity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures: Provide adequate ventilation. The risk of inhalation of dust must be minimised as much as possible.

| <u>Chemical name:</u> | <u>Exposure limits:</u> | <u>Type:</u> | <u>Notes:</u> | <u>References:</u> |
|------------------------------------|-------------------------|--------------|---------------|--------------------|
| Dusts non-specific-respirable | 4 mg/m ³ | TWA | - | EH40 |
| Dusts non-specific-total inhalable | 10 mg/m ³ | TWA | - | EH40 |

Personal protection: Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment

Respiratory equipment: During dust-raising work: Use respiratory equipment with particle filter, type P2.

Hand protection: Under normal conditions of use gloves are not normally required.

Eye protection: Wear eye protection if dust is generated during handling.

Skin protection: No special precautions.

Hygiene measures: Wash hands after handling.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: light brown granular powder
Odour: Odourless
pH: 4.5 ± 0.5
Melting point: not relevant
Boiling point: not relevant
Decomposition temperature: not known
Flash point: not known
Explosion limits: not known
Vapour pressure: not relevant
Vapour density: not relevant
Relative density: 0.3-0.7 g/cm³
Solubility: partly soluble in water

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperature conditions and recommended use.

Conditions/
materials to avoid: Water, moisture.

Hazardous
decomposition products: When heated and in case of fire, carbon monoxide, carbon dioxide and low-molecular hydrocarbons may be formed.

11. TOXICOLOGICAL INFORMATION

Inhalation: Dust may irritate throat and respiratory system and cause coughing.

Skin contact: Dust has an irritating effect on moist skin.

Eye contact: May cause temporary eye irritation.

Ingestion: No harmful effects expected in amounts likely to be ingested by accident.

Specific effects: Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.

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12. ECOLOGICAL INFORMATION

Mobility: The product is not volatile but may be spread by dust-raising handling.

Degradability: The product is slowly degradable.

Ecotoxicity: The product is not expected to be hazardous to the environment.

Bioaccumulative potential: Bioaccumulation: Is not expected to be bioaccumulable.

Other adverse effects: None known.

13. DISPOSAL CONSIDERATIONS

Dispose of waste and residues in accordance with local authority requirements.

Waste from residues: EWC-code: 02 03 99

Contaminated packaging: EWC-code: 15 01 01

14. TRANSPORT INFORMATION

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

15. REGULATORY INFORMATION

Labelling: Based on information from the manufacturer regarding the chemical composition, the product is not liable to classification and labelling.

National regulation: Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (S.I 2009 No. 716).
The Control of Substances Hazardous to Health Regulations 2002 (S.I 2002 No. 2677) with amendments.
EH40/2005, Workplace exposure limits 2005, with amendments
The List of Wastes (England) (Amendment) Regulations 2005. (SI 2005 No. 895).

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16. OTHER INFORMATION

The user must be instructed in the proper work procedure and be familiar with the contents of these instructions.

The following sections contain revisions or new statements: 1, 2, 3, 8, 15 & 16

The information on this data sheet represents our current data and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user.

Made by DHI - Centre for Environment and Toxicology, Agern Allé 5, DK-2970 Hørsholm, Denmark. www.dhigroup.com.

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