

FIBREX[®] in meat applications

Suggestions and possibilities

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First created: 1997-05-24
Latest review: 2009-04-14

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Facts about FIBREX®

FIBREX is a natural fibre without any additives and has therefore no E - number.
Recommended declaration: Sugar beet fibre, beet fibre or vegetable fibre from sugar beet.

Average composition per 100g

73g of dietary fibre* of which roughly 1/3 is soluble.

29 g	hemicellulose
22 g	pectin
18 g	cellulose
4 g	lignin
9 g	protein (no gluten)
5.5 g	sugar
4 g	minerals
0.5 g	fat

Energy value	266 kJ (63 kcal)
PH	4.5 ± 0.5

*According to the difference method
(67 g dietary fibre according to AOAC)

Water holding capacity: 3.5 - 4 times its own weight, thermo stable.

Water uptake capacity: Approx. 7 times its own weight.

Fractions

Grade	Particle size	Kilos/bag	Net weight/ pallet
575	< 32 µm	22	660 kg
595	< 125 µm	22	660 kg
600	< 0,5 mm	22	660 kg
608	< 2 mm	22	660 kg
610	0,4 - 1,2 mm	22	660 kg
620	Coarse, un-milled	14	420 kg
630	Flakes	16	480 kg

In general terms FIBREX increases the water holding capacity by absorption and adsorption.
The water absorption increases slightly with increasing particle size.

Although FIBREX has no extreme affinity to fat, fat is adsorbed to the surface of the particles. Consequently, the finer the FIBREX grade, the higher the fat adsorption.

In some applications fat is held back in the product through the fact that FIBREX partially prevents the migration of water/fat emulsion.

Emulsion products

Maximum addition 1.5%. The taste/spicing and appearance will be the limitation, so start with a low addition and work up to the limit.

Bouillon loss

The bouillon consists of water with soluble proteins and melted fat. These substances migrate in the sausage and appear as a fatty mass just inside the casing.

With the use of FIBREX in the recipe, the fibre will bind more fat and water and thereby decrease the loss of bouillon.

Use FIBREX 595 (FIBREX 600 if a coarser fraction is required).

Water binding

FIBREX binds water 3.5 - 4 times its own weight, thermo stable.

Fat binding

FIBREX will decrease the loss of fat. Add FIBREX 595 on top of other ingredients.

As FIBREX only bind fat by adsorption (on the particle surface), the fat binding will increase with a smaller particle size (= smaller fraction).

Consistency improvement

Soft products will be more firm when FIBREX is added. Either you just add FIBREX to the recipe or you adjust the amount of for example potato starch, milk powder or a fat component.

Use FIBREX 595 or 600.

Texture improvement

FIBREX improves the texture of the product. By a better bite and a mouth feel of more meat (= less fat) FIBREX adds more value to the product.

Fat mimicking

The finer particle sizes of FIBREX 595 and especially FIBREX 575 are often used for fat imitation. These finer particles will mix very well with fat products. You will have to be observant of the taste if you replace fat. Fat is a good taste carrier, something that even FIBREX cannot imitate. If the recipe so allows - replace some of the most fatty ingredients.

Frankfurter (in-expensive)

<u>Ingredients</u>	<u>amount</u>
Beef trimmings, 25% fat	10.0
Pork meat trimmings, 18% fat	10.0
Pork head meat	9.0
Pork fat with rind	14.0
Tallow	3.0
Pork rind	3.0
Blood plasma 12-13%	12.5
Milk powder	5.0
Potato flour	4.0
FIBREX 595	1.5
Onion, granulated	0.3
Water (ice)	27.0
Salt with nitrite	2.0
Pepper	0.15
Ascorbic acid	0.03
Dextrose	1.0
Total	102.5

Fermented Sausages

Salami

Addition 1-2% depending on spicing. The appearance will set the limitation.

Texture and consistency

By adding FIBREX you will improve texture and firmness, especially on simpler products with lower meat content. Add FIBREX on top of the recipe or, if applicable, replace some of the milk powder.

Recipe suggestion

German sausage type

<u>Ingredients</u>	<u>amount</u>
Beef trimmings, 18 % fat	29.1
Pork meat trimmings, 18% fat	29.1
Lard	20.4
Water (ice)	12.8
Potato flour	3.3
Salt with nitrite	2.6
Raisins	1.0
FIBREX 600	1.5
Pepper	0.3
Cognac aroma	0.15
Fermenting culture	0.05
Ascorbic acid	0.02
Total	≈100.0

Minced Meat Products

The limitations to FIBREX addition depends on the spicing. Generally start low and increase to the limit.

Type of product:	Burgers	<1% FIBREX addition
	Meat balls	1 - 1,5% FIBREX addition
	Meat loaf	<2% FIBREX addition

Water binding

To improve the water binding capacity in this kind of products, begin to test FIBREX 595 or 600 added to the recipe.

Consistency improvement

Soft products can be stabilised by adding FIBREX. Use FIBREX 595 or 600 added to the recipe.

Texture improvement

When you add FIBREX with larger particles to the product, it will get a firmer texture and a better bite. The particle size to use depends on the product. All fractions from FIBREX 595 to 630 can be used. Depending on the structure and the meat quality, you might have to add liquid (water or bullion).

Forming aid

Adding FIBREX to products that are difficult to shape in machinery will help forming the product. The fibre should be allowed some time to swell. The consistency and texture of the product will determine what fraction of FIBREX to use.

Recipe suggestion

Burger

<u>Ingredients</u>	<u>amount</u>
Beef trimmings, 25 % fat	30.0
Pork meat trimmings, 18% fat	19.0
Pork fat	8.0
Milk powder	3.0
Water (ice)	30.0
Potato dried, flakes	2.0
Bread crumbs	4.0
Salt	1.7
Onion, granulated	0.6
Seasoning	0.7
FIBREX 610	1.0
Total	100.0

Convenience food & cooked products

Russian pasty, Pizza, Liver paste, Spring rolls

Maximum addition 2.5 %. The taste (i.e. the spicing) will set the limitation.

Binding water and bouillon

In complex products like Russian pasty or spring rolls you can prevent bouillon/spice from the filling to migrate to the wrapping and make it soggy. Use small to moderate particles, for example FIBREX 595 or 600.

Filling aid

Products that are very splashy when warm, for example liver paste, can be stabilised with FIBREX and thereby be easier to fill in the package.

Consistency improvement

If the product is too soft it will be firmer when FIBREX is added. Either you add FIBREX to the recipe or you replace, wholly or partially ingredients with a poorer yield of consistency, for example potato starch, milk powder or a fatty component.

Use FIBREX 595 or 600.

Texture improvement

FIBREX will improve the texture. The particle size you add is depending on the nature of the product. The fractions with large particles will give a better bite/mouth feel and the smaller particles will improve the firmness.

Do not forget to adjust with liquid (water or bullion) to the right consistency.

Liver paste

<u>Ingredients</u>	<u>amount</u>
Pig liver	30.0
Pork fat from cheek	41.0
Wheat flour	4.5
Milk powder	2.0
Sugar	0.8
FIBREX 595	1.8
Salt	1.5
Potato flour	2.0
Sodium caseinate	1.3
Seasoning	0.2
Water	21.0
Total	≈106.0

Meat sauces

Minced meat sauce, Sauce Bologna, Chilli con carne, Goulasch

Addition rate approx. 2%. The spicing will set the limitation, start low and work up to the limit.

Texture improvement

When you add FIBREX with coarse particles, the sauce will get an increased amount of particles that the consumer will experience as a higher meat content. All sorts of FIBREX from 595 to 630 can be regarded depending on the desired texture.

Recipe suggestion

Minced meat sauce

<u>Ingredients</u>	<u>amount</u>
Meat, ground	28.0
Ham, smoked, ground	4.0
Salt	0.2
Carrots	6.0
Celeriac	6.0
Onions	4.9
Shortening	3.0
FIBREX 630	1.6
Tomato purée	2.0
Meat bouillon	43.0
Wheat flour	1.3
Total	100.0

Replacement of ingredients with risk of allergic reactions

Types of products that can be replaced by FIBREX:

(Regarding stability and texture)

- Milk products such as milk powder (lactose.)
- Bread crumbs (gluten).
- Soya products.
- Pea products

Replacement recommendations

If you exchange an ingredient in a recipe, you can start with the following recommendations:

Amount of FIBREX	+	Extra water	=	As replacement for
1 part		≈ 2 parts		≈ 2 parts milk powder
1 part		≈ 2 parts		≈ 3 parts fatty meat ingredient
1 part		≈ 1 part		≈ 2 parts potato starch
1 part		≈ 1,5 parts		≈ 2 parts bread crumbs
1 part		≈ 0,5 parts		≈ 1 part textured soy 50%
1 part		≈ 1 part		≈ 2 parts meat trimmings
1 part *		≈ 3,5 parts		-

If the product is too soft, you might have to lower the amount of water to achieve the right consistency.

Production costs

The cost of raw material will often be reduced if you follow the recommendations above. By FIBREX ability to retain bouillon and meat juices a better calculation, a higher yield, is obtained.

* If FIBREX is added on top of the recipe.

Test results

Results from trials with meat sauce, minced pork and burgers, performed with FIBREX at one of Sweden's leading food processors.

Meat sauce (sauce Bologna)

All products were made with meat from the same batch of ground meat

The recipe contained meat, onions, tomatoes, emulsifier, condiments etc.

FIBREX 610 and FIBREX 620 respectively plus water was added "on top" of the recipe.

Samples	Original	1	2
FIBREX 610 alternatively 620	0	1,0%	2,0%
Water addition	0	3,5%	7,0%

Trials

The original, sample 2 with FIBREX 610 and sample 2 with FIBREX 620 were tested in a first round. The trials were performed with coded samples.

Results

	Original	Sample 2 / Fibrex 610	Sample 2 / Fibrex 620
Colour	Clearest red	Brownish red	Brownish red
Appearance	"Less meaty"	"More meaty" but grainy	"Most meaty"
Taste	Dominating tomato flavour	Slight "off taste"	Less tomato flavour
Consistency	Thin	Thicker but grainy	"Meaty"

Sample 2 with FIBREX 620 was regarded so interesting that sample 1 with FIBREX 620 was also judged. The result was better colour, better taste and good "meatiness"

FIBREX and the added water furthermore gave a lower raw material cost per kg finished product.

Minced meat products (reconditioned meat/meat patties/pork sausage)

The products were made from the same batch of minced meat. The samples were mixed in a food-processor following the same procedure.

FIBREX 595 and another fibre product on the market (Fibre A) were compared in ascending addition rate and the water was increased accordingly.

The original recipe contained meat, potatoes, 0.6% Fibre A etc.

Sample	Original	1	2	3
Fibre A	0,6%	1,0%	1,5%	0,0%
FIBREX 595	0,0%	0,0%	0,0%	1,0%
Water	0,0%	1,4%	3,4%	1,4%

Trials

The samples were judged in blind tests and in the first round the original recipe was compared with sample 1 and 2. The best of these (sample 1) was then compared with sample 3. The combinations were unknown to the judges.

Results

In the first round, sample 1 with 1% Fibre A was rated best.

In the second round, sample 1 was compared with sample 3.

Sample 3 (with FIBREX 595) was rated best and furthermore economically advantageous.

Burgers

The products were made from the same batch of minced meat. The samples were mixed in a food-processor following the same procedure.

The original recipe contained meat, bread crumbs, 4.5% protein concentrate, condiments etc.

The protein concentrate was replaced with increasing amounts of FIBREX 600 supplemented with potato flour.

Trial	Original	1	2	3
Protein concentrate	4,5%	0,0%	0,0%	0,0%
FIBREX 600	0,0%	0,5%	1,0%	1,5%
Potato flour	0,0%	4,0%	3,5%	3,0%

Trials

The trials were performed as blind tests.

The original and all samples were judged against each other.

Results

Sample 2 with 1% FIBREX 600 and 3.5% potato flour was rated best.

Raw material cost was reduced when the protein concentrate was replaced by FIBREX 600 and potato flour.

In meat products

These suggestions should be regarded as guidelines. Every product is unique to the manufacturer and the demands of his customers must be considered first.

FIBREX's properties can be used in different meat systems to:

- increase water binding capacity / decrease loss of fluid
- decrease fat losses
- improve texture
- improve consistency
- stabilise uncooked slurry mixtures
- improve forming
- improve filling
- replace fat
- replace certain ingredients with risk of allergic reactions
- lower cost of raw material
- increase the fibre content