

PEKTOS

BEEET FIBER BF 5 & BF 10

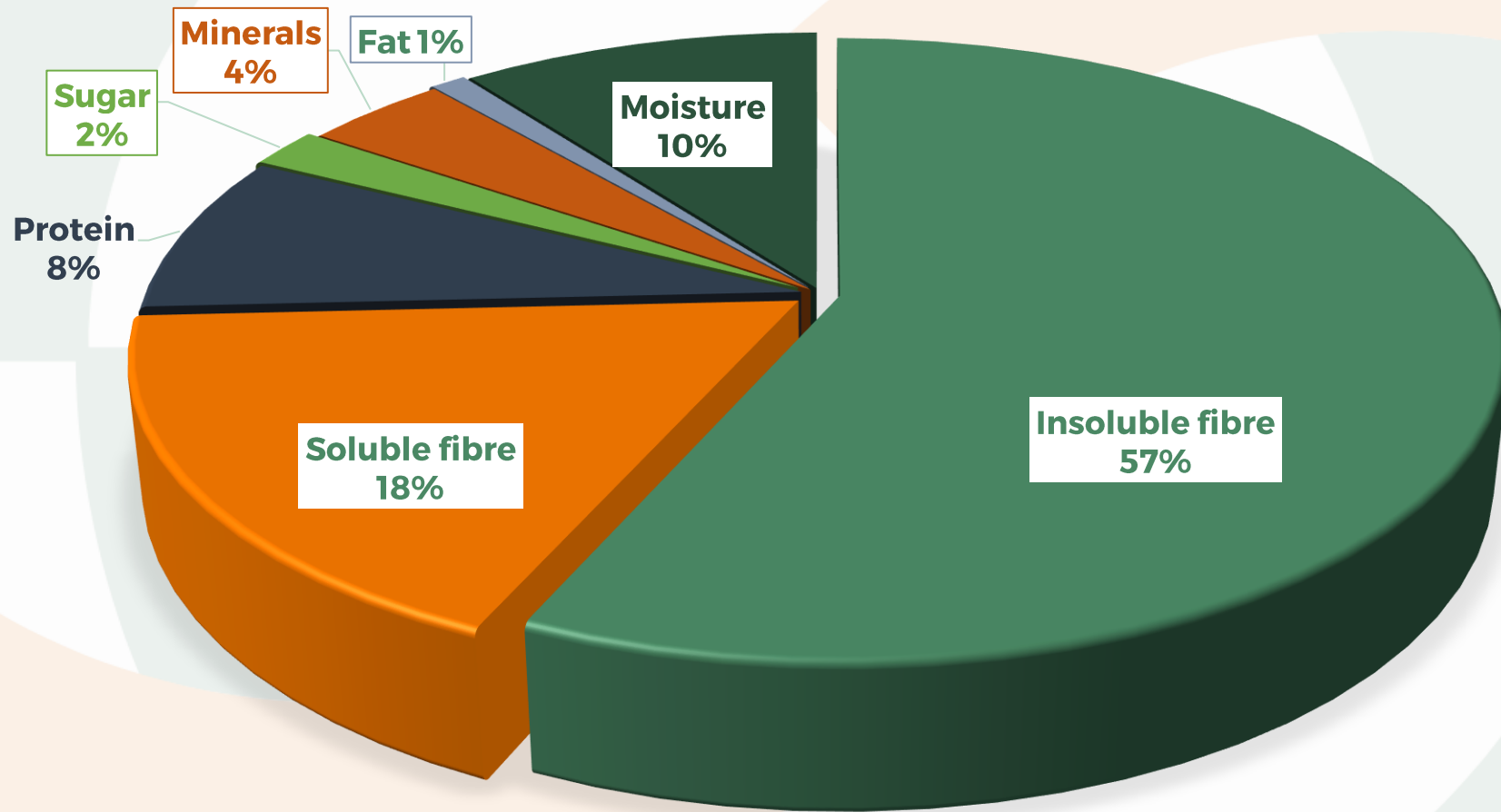
Functional and healthy fiber from the fields of Northern Switzerland



BEET FIBER BF 5 / BF 10 – facts

- ❖ 100% pure sugar beet fiber, from the species 'Beta vulgaris'.
- ❖ Produced in Germany from sugar beets grown in Switzerland after the sugar extraction, by drying, purification, sifting, milling, standardization.
- ❖ No processing aids used during production.
- ❖ Dietary fiber content: min. 70%, of which min. 52% insoluble fiber, max. 18% soluble fiber.
- ❖ BEET FIBER BF 5: low water-binding capacity
- ❖ BEET FIBER BF 10: medium water-binding capacity
- ❖ Available in super-fine, fine to coarse particle sizes, and flakes.
- ❖ Multi-functional dietary fiber ingredient that provides dietary fiber content, moisture retention and texture to a variety of food products.
- ❖ Clean-label, E-No. free. Labelled as beet fiber, plant or vegetable fiber or similar.
- ❖ Beige/greyish powder, granules or flakes, with earthy note..
- ❖ Gluten-free (< 20ppm)
- ❖ Non-GMO
- ❖ GRAS
- ❖ Kosher, Halal
- ❖ Allergen free

BEET FIBER BF – *composition* (average values)



BEET FIBER BF – *qualities*

- ❖ **BEET FIBER BF 5** – Standard quality
- ❖ **BEET FIBER BF 10** – Superior Quality
- ❖ **Bio/Organic Quality** under development

- ❖ **WBC (Water Binding Capacity)**
 - ❖ **BEET FIBER BF 5:** 3.5 – 6.0 g water/1g fiber
 - ❖ **BEET FIBER BF 10:** 7.0 – 10.0 g water/1g fiber

BEET FIBER BF 5 / BF 10 – *grades*

PEKTOS Beet Fiber Grade	Particle Size, Granulation
BEET FIBER BF 5 A / BF 10 A	min. 90% < 0.07 mm
BEET FIBER BF 5 C / BF 10 C	min. 95% < 0.15 mm
BEET FIBER BF 5 E	min. 95% < 0.50 mm
BEET FIBER BF 5 G	Min. 95% < 0.50 mm, max. 5% > 1.40 mm
BEET FIBER BF 5 H	Coarse, not milled
BEET FIBER BF 5	Flakes, rolled
BEET FIBER BIO BF 5 / BF 10	BIO certified

PDS

Please note:

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PRODUCT DATA SHEET



PEKTOS BEET FIBER BF 5/BF 10

Origin, Raw Material, Production

PEKTOS BEET FIBER BF 5 and BF 10 is

- Functional sugarbeet fiber.
- Pure, undiluted, 100% sugarbeet fiber.
- Produced from Swiss natural beet pulp after sugar extraction.
- Produced (washing, milling, sifting, standardization) and packed in Germany.

Features, properties, functionality

Dietary fiber is the edible part of plants or analogous carbohydrates resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine.

Dietary fiber includes polysaccharides, oligosaccharides, lignin, and associated plant substances. Functional fibers consist of isolated, non-digestible carbohydrates that benefit humans.

PEKTOS BEET FIBER BF 5 / BF 10 is a natural, gluten-free (EU limit < 20ppm), clean label, and multi-functional dietary fiber suitable for a variety of food products through its high fiber content, the excellent water-binding and moisture retention capacity as well as the texture it creates and provides.

Total dietary fiber content:	≥ 70 %
of which soluble:	< 18 %
of which insoluble:	≥ 52 %

PEKTOS BEET FIBER BF 5 / BF 10 is a fine powder, beige/grey in colour, and with a typical, earthy note.

PEKTOS BEET FIBER BF 5 and BF 10 is available in a range of particle sizes and shapes to suit a multitude of applications:

March 2023, v2

- PEKTOS BEET FIBER BF 5 A / BF 10 A: Super-fine particle size, 70 micron
- PEKTOS BEET FIBER BF 5 C / BF 10 C: Fine particle size, 150 micron
- PEKTOS BEET FIBER BF 5 E: Medium particle size, 500 micron
- PEKTOS BEET FIBER BF 5 G: 10% < 400 micron, 5% > 1,400 micron
- PEKTOS BEET FIBER BF 5 H: Coarse, not milled
- PEKTOS BEET FIBER BF 5 Flake: Flakes, rolled

The sugar extraction process, subsequent washing and specialized storing conditions loosen the strong bonds between the hemicellulose, pectin, proteins, and sugars. That creates enhanced functionality through the expanded fiber matrix, leading to a considerable water-binding capacity (WBC).

The water-binding capacity of

- PEKTOS BEET FIBER BF 5 is 3.5 – 6.0 g water/1g fiber
 - PEKTOS BEET FIBER BF 10 is 7.0 – 10.0 g water/1g fiber
- with little mixing (for instance, by stirring it into water).
Oil binding capacity is approximately 4 g oil/1g of fiber.

PEKTOS BEET FIBER BF 5 / BF 10 dispersions in water display a pasty, pulpy, slightly gritty and fibrous texture, non-flowing with little syneresis, after a short and vigorous stirring or slight mixing.

In food systems with free water, PEKTOS BEET FIBER BF 5 and BF 10 create viscosity, texture, and body; it stabilizes the water and shows excellent process stability (heat, pH, salt, shear, freeze/thaw stability).

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PRODUCT DATA SHEET



Applications and benefits

- Bakery products
 - Gluten-free bread and cakes
 - Yield increase and freshness prolongation
 - Fiber enrichment
- Flavours, spices
 - Carrier substance
- Pasta Fillings
 - Yield increase
 - Moisture management
 - Texture optimization
- Processed meat
 - Texture improvement
 - Moisture retainment
 - Yield increase
 - Emulsion stabilizer
- Sauces, marinades, dressings
 - Thickener, binder, texture provider
 - Tomato paste extender
 - Fat replacement
- Beverages
 - Fiber source
- Nutraceuticals & Supplements
 - Fiber supplement
 - Soluble and insoluble fiber source
 - Slimming and weight management
 - Digestion improvement
- Pet Food
 - Fiber supplement
 - Breakage reduction
 - Texture improvement

To our best knowledge, the information contained herein is true and accurate. Still, all recommendations or suggestions are made without guarantee since we can neither anticipate nor control the different conditions under which this information and our products are used. Therefore, each manufacturer should evaluate its final products to determine compliance with all relevant federal, state, and local regulations. Further, we can disclaim all liability concerning its customers' infringement of third-party intellectual property, including, but not limited to, patents.



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Technical Data Sheet



PEKTOS BEET FIBER BF 5

Description	PEKTOS BEET FIBER BF 5 is a dietary vegetable fiber for the food industry produced from 100 % Swiss natural sugar beet pulp after sugar extraction.
Types	Pektos Beet Fiber BF 5 A, Pektos Beet Fiber BF 5 C, Pektos Beet Fiber BF 5 E, Pektos Beet Fiber BF 5 G, Pektos Beet Fiber BF 5 H and Pektos Beet Fiber BF 5 Flake
Declaration	Vegetable fiber (sugar beet fiber)
Applications	Clean-label food for texture, water binding, and freshness
Sensory	Appearance: Free-flowing powder Colour: From light beige to greyish-light brown depending on particle size Flavour: Typical
Physical/Chemical	Moisture: < 10,5 % Water binding: 3,5 – 6,0 g / g fiber Ash: < 4 % pH: 4,0 – 6,0
Particle size	Pektos Beet Fiber BF 5 A: min 90 % < 0,070 mm Pektos Beet Fiber BF 5 C: min 95 % < 0,150 mm Pektos Beet Fiber BF 5 E: min 95 % < 0,500 mm Pektos Beet Fiber BF 5 G: max 10% < 0,400 mm / max 5 % > 1,400 mm Pektos Beet Fiber BF 5 H: coarse, not milled Pektos Beet Fiber BF 5 Flake: flakes, rolled
Microbiology	Total plate count: < 2.500 cfu/g Moulds and Yeast: < 150 cfu/g E. Coli: neg. in 1 g Salmonella: neg. in 25 g
Nutritionals	Energy: average 810 KJ / 200 kcal Total Fat: < 1 % - Saturated Fat: < 0,3 % Protein: < 8 % Carbohydrates: ≤ 3 % - Sugar: ≤ 2,5 Dietary Fiber: ≥ 70 % Sodium: < 0,25 %

Version 4 – January 2023

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Technical Data Sheet



PEKTOS BEET FIBER BF 5

Packaging	Multilayer paper bags or boxes with PE liner. Pektos Beet Fiber BF 5 A-G: 22 kg/bag Pektos Beet Fiber BF 5 H: 14 kg/bag Pektos Beet Fiber BF 5 Flake: 16 kg/bag
Storage	Keep in a dry and cool place (rel. humidity < 65 %), protected from direct light.
Shelf life	36 months from the production date in unopened packaging.
HS Code	2303.2090
Purity / Compliance	
Heavy metals	Contents of heavy metals comply with Regulation 1881/2006/EC setting max. levels of certain contaminants in foodstuff.
Pesticides	Residues of pesticides comply with the requirements of Regulation 396/2005/EC on max. residue levels of pesticides in or on food of plant origin.
GMO	PEKTOS BEET FIBER BF 5 does not contain genetically modified organisms and is not produced from genetically modified raw materials as defined in Regulations (EC) 1829/2003 and 1830/2003.
Allergens	The product does not contain allergens listed in Annex II of Regulation (EC) 1169/2011 and its current amendments. The product contains < 20 ppm gluten and can be labelled gluten-free.
Irradiation	The product is processed without the use of irradiation.
General	PEKTOS BEET FIBER BF 5 complies with the EU Food Regulations, Swiss Food Laws, and EC Regulations on the hygiene of foodstuffs. Please consult your country's laws and food regulations before using the product.

The information given in this document is provided by PEKTOS AG only as a courtesy and is intended to be general in nature. PEKTOS AG makes no warranty, express or implied, regarding its accuracy or completeness. The customer is solely responsible for determining whether the product is suitable for the intended use and for obtaining any necessary governmental registrations and approvals.

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Technical Data Sheet



PEKTOS BEET FIBER BF 10

Description	PEKTOS BEET FIBER BF 10 is a dietary vegetable fiber for the food industry produced from 100 % Swiss natural sugar beet pulp after sugar extraction.
Types	Pektos Beet Fiber BF 10 A, Pektos Beet Fiber BF 10 C.
Declaration	Vegetable fiber (sugar beet fiber)
Applications	Clean-label food for texture, water binding, and freshness
Sensory	Appearance: Free-flowing powder Colour: From light beige to greyish-light brown depending on particle size Flavour: Typical
Physical/Chemical	Moisture: < 10.5 % Water binding: 7.0-10 g / g fiber Ash: < 4 % pH: 5.0 - 6.8
Particle size	Pektos Beet Fiber BF 10 A: min 90 % < 0.070 mm Pektos Beet Fiber BF 10 C: min 95 % < 0.150 mm
Microbiology	Total plate count: < 2,500 cfu/g Moulds and Yeast: < 150 cfu/g E. Coli: neg. in 1 g Salmonella: neg. in 25 g
Nutritionals	Energy: average 810 KJ / 200 kcal Total Fat: < 1 % - Saturated Fat: < 0.3 % Protein: < 8 % Carbohydrates: ≤ 3 % - Sugar: ≤ 2.5 % Dietary Fiber: ≥ 70 % Sodium: < 0.25 %

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Technical Data Sheet



PEKTOS BEET FIBER BF 10

Packaging	Multilayer paper bags or boxes with PE liner. Pektos Beet Fiber BF 10 A / BF 10 C: 22 kg/bag
Storage	Keep in a dry and cool place (rel. humidity < 65 %), protected from direct light.
Shelf life	36 months from the production date in unopened packaging.
HS Code	2303.2090
Purity / Compliance	
Heavy metals	Contents of heavy metals comply with Regulation 1881/2006/EC setting max. levels of certain contaminants in foodstuff.
Pesticides	Residues of pesticides comply with the requirements of Regulation 396/2005/EC on max. residue levels of pesticides in or on food of plant origin.
GMO	PEKTOS BEET FIBER BF 10 does not contain genetically modified organisms and is not produced from genetically modified raw materials as defined in Regulations (EC) 1829/2003 and 1830/2003.
Allergens	The product does not contain allergens listed in Annex II of Regulation (EC) 1169/2011 and its current amendments. The product contains < 20 ppm gluten and can be labelled gluten-free.
Irradiation	The product is processed without the use of irradiation.
General	PEKTOS BEET FIBER BF 10 complies with the EU Food Regulations, Swiss Food Laws, and EC Regulations on the hygiene of foodstuffs. Please consult your country's laws and food regulations before using the product.

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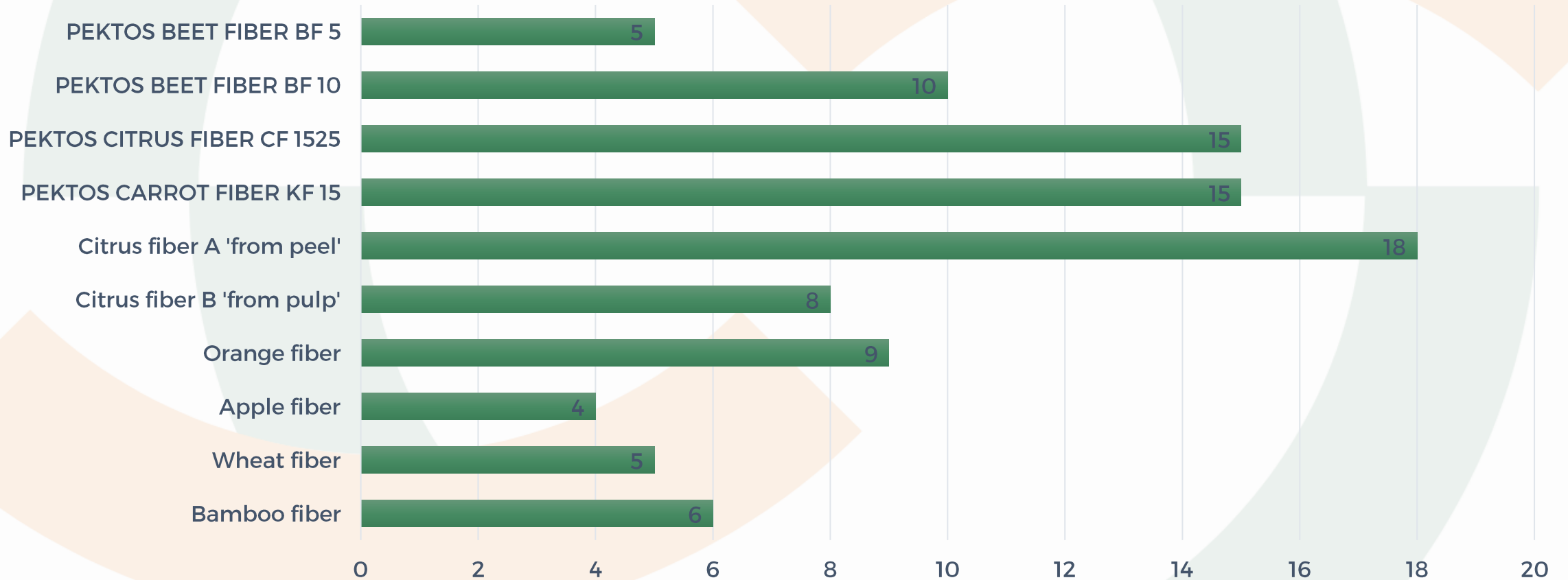
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Water Binding Capacity of various commercial fibers

WBC in g of water/g of fiber, average value from various tests and methods



BEET FIBER BF 5 / BF 10 - *applications*

Bakery



Snacks, soups,
extrusion,
vegetarian,
coatings etc.



Processed meat

Health

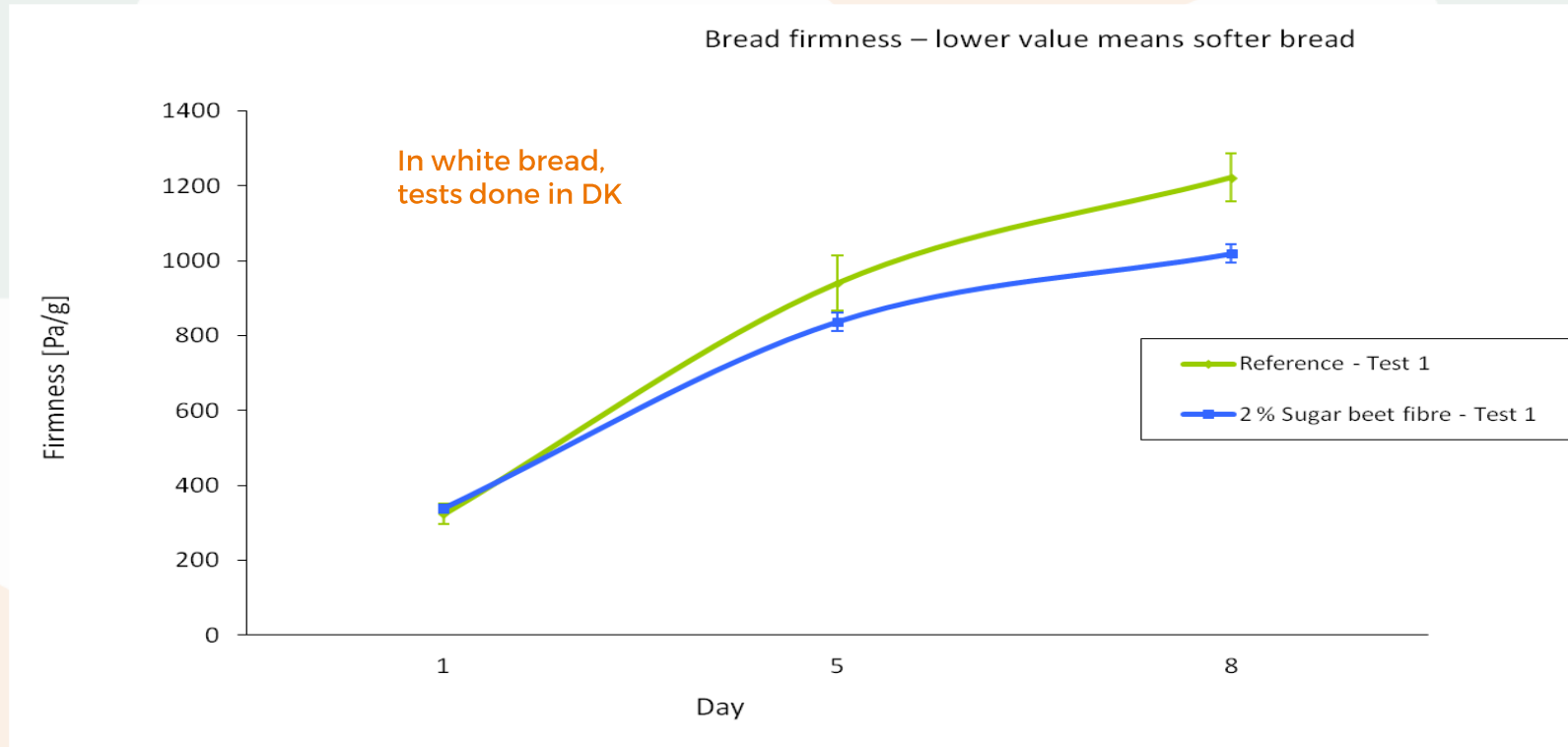


BEET FIBER BF 5 / BF 10 - *in bakery*

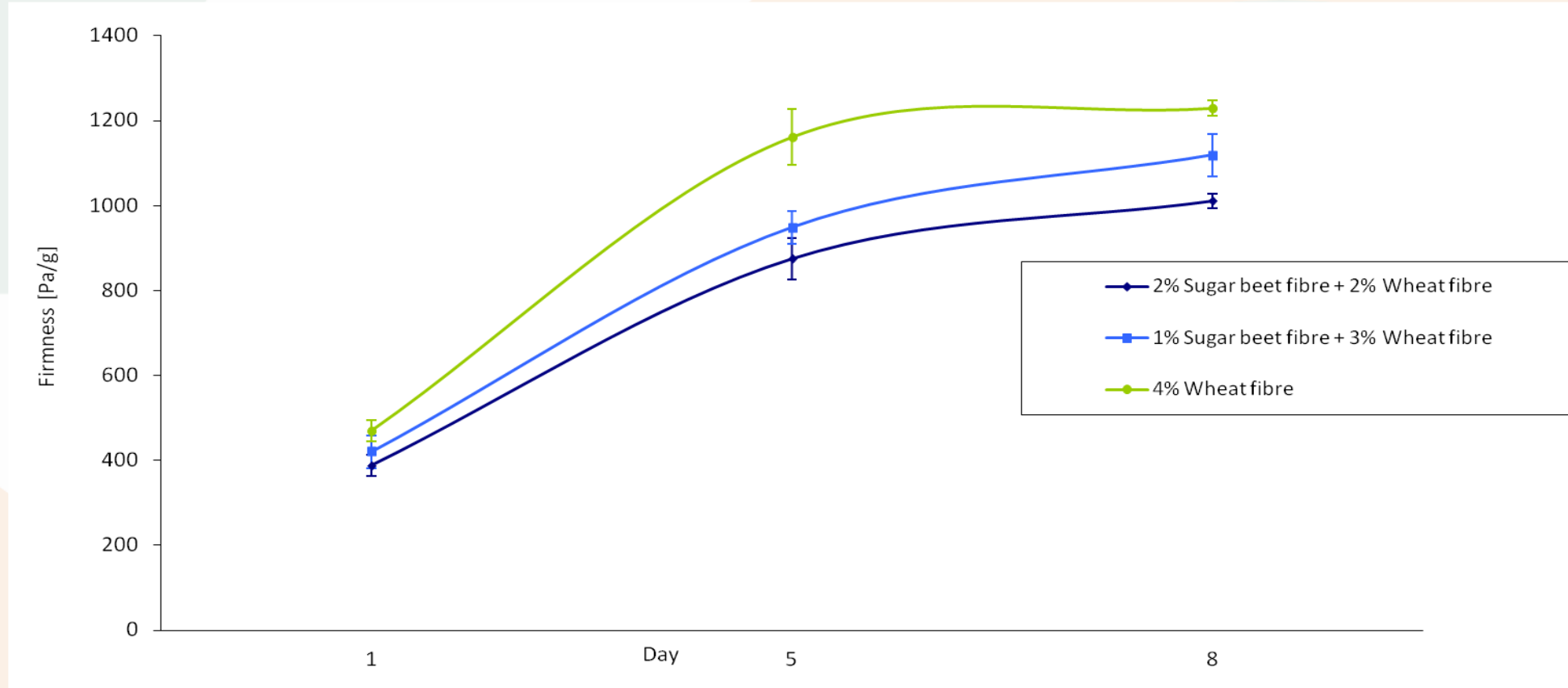
- Thermostable water holding.
- Prolonged fresh keeping.
- Better dough processability & yield.
- Stronger flour mixes.
- Reinforced cookie structure.
- Fibre enrichment.
- **Gluten-free** (<20ppm)



BEET FIBER BF 5 / BF 10 - *softness*



Beet fiber vs. wheat fiber - *softness*



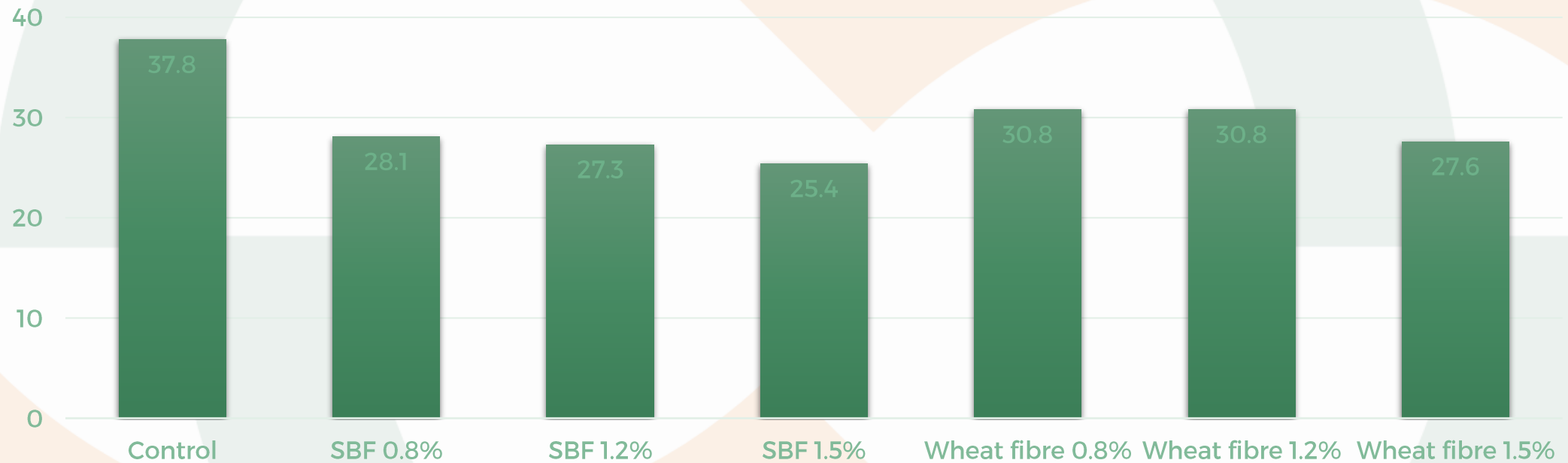
BEET FIBER BF 5 / BF 10 *- in meat*

- Positive effects on appearance, color, texture.
- Reduction of frying/cooking loss.
- Reduction of fermentation time in fermented sausages.
- Increased yield.
- Allergen-free.



Frying loss reduction

Frying loss (%)



The Nutrition and Food Safety Research Institute of the University of Barcelona

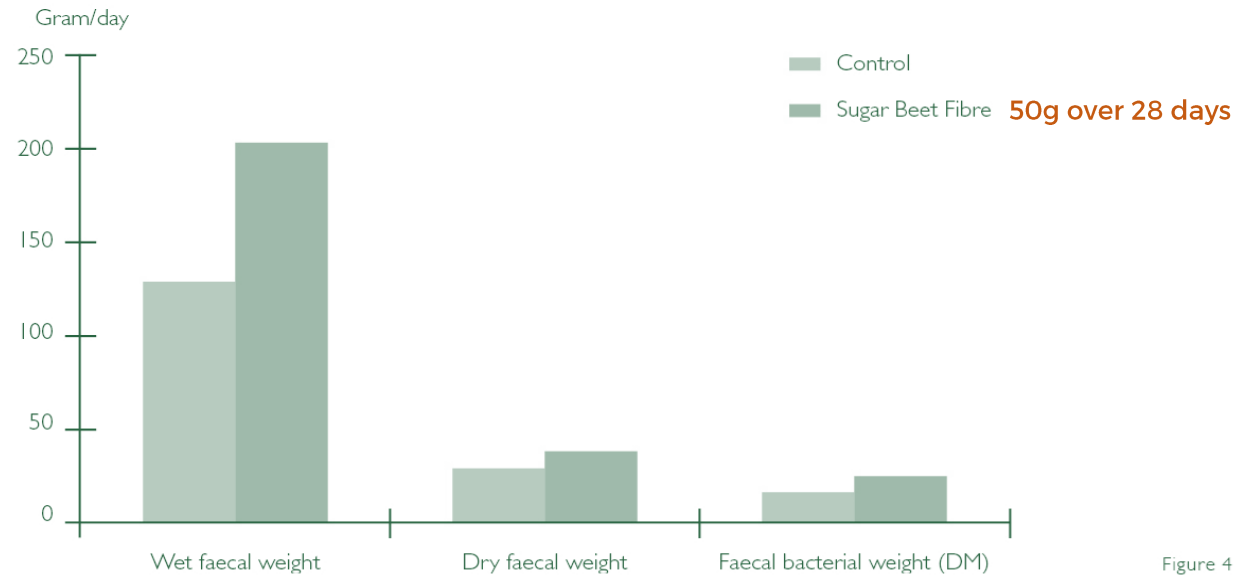
BEET FIBER BF 5 / BF 10 *- in health products*

- Bulking effect / Satiety.
- Improved bowel function.
- Normalized blood-glucose levels after meal.
- Lower LDL-cholesterol.
- Counteracts constipation / promotes regularity.
- *EU 13.5 Health claim 2014 "Increased faecal bulk" – prevention against gastrointestinal diseases.*



Increased faecal bulk

Wet and dry stool weights



Castiglia et al 1998: Wet faecal weight increased by 55% and dry weight by 35%.

Figure 4



“Many bowel disorders may be attributed to lack of faecal bulk” (Kritchevsky, 2001)

Beet fiber, 7g/day, stool frequency

Stool frequency variation

Giacosa et al 1990: All subjects had severe or moderate constipation before the study commenced. They were given 7g SBF per day, after a 30 day period 85% of the subjects had normal stool and faecal frequency.



Figure 5



Effects of insoluble and soluble fiber intake

Accelerates transit time

↓ glucose, insulin after meal

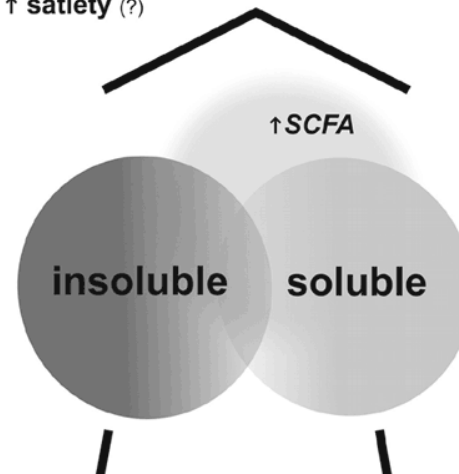
Increases faecal weight

↓ intestinal diseases

Water-holding capacity

↓ glucose, insulin after meal

- ↑ energy density
- ↑ bulking effect
- ↓ weight gain
- ↑ satiety (?)
- ↑↓ gut hormones
- ↓ inflammation
- (?) gut microbiota



- ↓ risk of type 2 diabetes
- ↑ insulin sensitivity
- ↑ gut transit time
- ↓ postprandial glucose response
- ↓ total and LDL cholesterol
- ↓ gastric emptying

Reduced nutrients uptake

↓ glucose, insulin after meal

Interacts with cholesterol, bile acid

↓ cholesterol

Promotes growth of healthy bacteria

↓ intestinal diseases, cancer

Clinical documentation – digestive health

EU Health claim: Sugar beet fiber increases faecal bulk (high fiber = 6 g fiber per 100 g)

Sugar beet fiber vs. insoluble wheat bran¹

- 17 healthy men, cross-over study
- 20 g/day (sprinkled), 1 month per diet

→ Faecal weight increased by both types
→ Sugar beet fiber increased moisture

"Sugar beet fiber acts as an insoluble fibre"

¹ Lampe, J.W., et al., *Eur J Clin Nutr*, 1993

Sugar beet fiber vs. soluble inulin²

- 9 young healthy men, 3*3 design
- 25-50 g/day (sprinkled/baked), 1 month per diet

→ Faecal weight increased by both fibers
→ Increased faecal bacterial weight
→ Stool frequency increased by both fibers

"Explained by soluble fibers' effect to increase bacterial mass"

² Castiglia-Delavaud, C., et al., *British Journal of Nutrition*, 1998

Clinical documentation – blood cholesterol

EU Health claim:

Pectin contributes to the maintenance of normal blood cholesterol levels (6 g pectin per day)

Mild hyper-cholesterolemia¹

- 27 women, cross-over study
- 30 g SBF/day = 6 g pectin
- 1 month per diet

→ Total blood cholesterol levels lowered
(-0.2 mmol/L not significant)
→ "Bad" cholesterol levels lowered
(-0.3 mmol/L)

¹ Israelsson B. Et al., Scand J Nutr, 1993

Healthy subjects²

- 34 men and women, "cross-over" study
- 30 g sugar beet fiber = 6 g pectin
- 3 weeks per diet

→ Total blood cholesterol levels lowered
(-0.7 mmol/L)
→ "Bad" cholesterol levels lowered
(-0.5 mmol/L)

"No effect of insoluble fibers, but of soluble"

² Lampe J.W. Et al., Am J Clin Nutr, 1991