

Matching today's expectations.
Functional fibres for better nutrition.

beneo
connecting nutrition and health

Matching today's expectations.

Essential ingredients for a healthy lifestyle.

With the pace of life continuously accelerating, the global trend towards easy-to-prepare and on the go food continues. At the same time, market research has shown that today's consumers are increasingly realising the positive effect nutrition can have on their well-being.

People today are looking for food and snacks that support a healthy lifestyle from an early age – by supporting a healthy digestion, by helping them to manage their weight and by maintaining an overall fitness.

When it comes to the importance of dietary fibre intake for a healthy nutrition, public awareness has been steadily growing over the last decades. Although vast parts of the world's population are still lacking a sufficient fibre intake, many consumers are already actively asking for convenient food and drinks that include dietary fibres.

Quantitative studies in five different European countries have shown that three out of five consumers consider it important to eat enough fibres. And in the USA more than half of the consumers look for fibre when managing their weight, for example. With the right dietary fibre at hand, food manufacturers can only benefit from answering these consumer demands.



Enhancing your product with prebiotic fibres.

Our prebiotic fibres Orafti® Inulin and Oligofructose are obtained from chicory and can be easily used in all kinds of convenient food and beverages. They are stable in most conditions and offer a long shelf life.

Extensive evidence has shown that BENEO prebiotic fibres improve the balance of the intestinal flora by stimulating beneficial bifidobacteria growth – an important element of good digestive health. A healthy gut environment in turn is the most important source for an overall well-being.

Furthermore, our prebiotic fibres have been proven to support weight management and help the body absorb more calcium for stronger bones. This way, they contribute to keeping people healthy – from an early age and throughout their entire life.

Their naturally good taste and creamy texture even allow replacing part of the sugar or fat content, thus creating healthier food without any major changes in the production processes. **Add the healthy fibre effect to your list of ingredients.**

At a glance: The benefits of BENEO prebiotic fibres.

Nutritional benefits

- Contributing to digestive health
- Supporting in blood glucose management
- Increasing calcium absorption for stronger bones (Orafti® Synergy1)
- Reducing overall calorie intake

Technical benefits

- Offering good solubility for all food applications
- Stealth sugar replacement
- Providing a short, creamy texture in fat-reduced foods
- Masking “off-tastes” from intense sweeteners



Discovering our prebiotic fibres.

BENEO's prebiotic fibres, Orafti® Inulin and Oligofructose, are inulin-type fructans. While they naturally occur in a great number of plants and vegetables, the chicory root is a particularly rich source. This is the reason why we gently extract Inulin from the chicory root.

Oligofructose is then derived from Inulin through partial enzymatic hydrolysis, a transformation naturally occurring in the chicory root during the late harvest period. Thus, both Inulin and Oligofructose are 100 percent vegetable origin. After the extraction process, we further purify Orafti® Inulin and Oligofructose so our products meet even the highest quality requirements, such as those for infant nutrition.

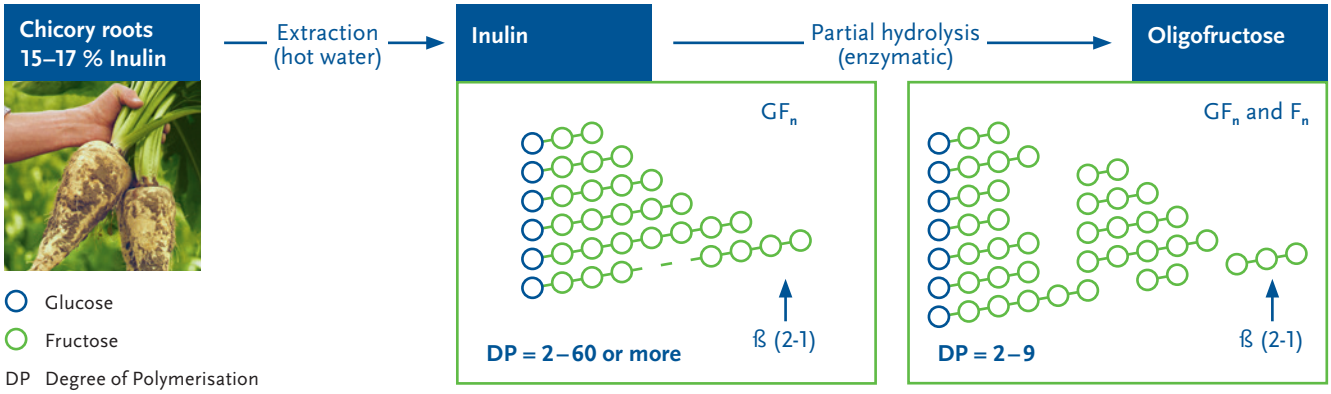
Matching all requirements.

BENEO prebiotic fibres can be categorised into five main product groups: standard Inulin, long chain Inulin, Oligofructose-enriched Inulin, Oligofructose (shorter chain Inulin) and Organic Inulin and Oligofructose. While Orafti® Inulin is noted for its texture enhancing benefits, Orafti® Oligofructose is applied when high solubility and a natural sweetness profile is asked for. Products such as Orafti® HSI or Orafti® Synergy1 combine the best of both.

	Inulin/ Oligofructose Content	Sweetness level	Descriptor
Standard Inulin			
Orafti® GR	~90 %	~10 %	Granulated Inulin powder, average DP≥10
Orafti® ST-Gel	~90 %	~10 %	Inulin powder for high dispersibility (instant), average DP≥10
Orafti® LGI	~98 %	N/A	Inulin powder with a lower sugar content
Orafti® HSI	~88 %	~30 %	High soluble Inulin powder
Long chain Inulin			
Orafti® FTX	~98 %	~0 %	Texturizing Inulin powder for fat replacement at **high** processing Temp
Orafti® HP	~100 %	~0 %	High performance Inulin powder for fat replacement at **low** processing Temp, average DP≥23
Orafti® HPX	~100 %	~0 %	High performance Inulin powder for fat replacement at **high** processing Temp, average DP≥23
Oligofructose-enriched Inulin			
Orafti® Synergy1	~92 %	N/A	Dedicated configuration of longer and shorter chain Inulin to achieve specific physiological effects
Oligofructose			
Orafti® L85	~85 %	~50 %	Liquid Oligofructose
Orafti® L90	~90 %	~40 %	Liquid Oligofructose
Orafti® L92	~92 %	~40 %	Liquid Oligofructose
Orafti® L95	~95 %	~30 %	Liquid Oligofructose
Orafti® P95	~95 %	~30 %	Oligofructose powder
Organic range			
Orafti® Organic IN	~95 %	~0 %	Organic Inulin powder
Orafti® Organic OF	~95 %	~30 %	Organic Oligofructose powder
Orafti® Organic BF	~95 %	~30 %	Organic Oligofructose powder, specifically for use in baby foods

Inulin/oligofructose content expressed on dry matter; Sweetness: % vs sucrose; DP: Degree of Polymerisation; Organic certified according EU legislation. Above values are indicative and may vary per specific end application and process.

Fig. 1: The process from chicory to Orafti® Inulin and Oligofructose.



Find your specific food application.

BENEO prebiotic fibres can easily be used in most food and drink applications.

- Baked goods
- Beverages
- Breakfast cereals & cereal bars
- Candy
- Chocolate
- Dairy alternatives
- Dairy products
- Dry mixes
- Fillings
- Frozen desserts
- Fruit preparations
- Meat products
- Soups & sauces
- Table spreads



Good to know: Key facts on BENEO prebiotic fibres.

- Inulin and Oligofructose are **food ingredients** and don't have to be labelled as additives.
- They are plant-based **dietary fibres**.
- In most countries their **caloric values** are confirmed as being in the **1 to 2 kcal/g** range.

Tapping the full potential of healthy nutrition.

Prebiotic fibres contribute to people's health and well-being in several ways. They have been scientifically proven to cater for digestive health and Orafti® Synergy1 plays a beneficial role in bone health by increasing intestinal calcium absorption. Furthermore a sufficient fibre intake helps to manage calorie intake. BENEO prebiotic fibres allow for healthy food that does not compromise on taste and texture in any way.

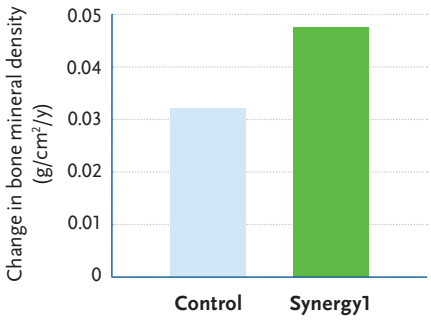
For a healthy digestive system: The prebiotic plus.

Both Orafti® Inulin and Oligofructose offer a prebiotic effect, a better regulated transit, a higher stool frequency and an overall healthier digestive system.

The reason? Our dietary fibres are not digested in the small intestine and therefore reach the large intestine almost intact. In the colon they are selectively fermented by bifidobacteria, a remarkable characteristic which qualifies them as 'prebiotics'. Numerous intervention studies have shown that Orafti® Inulin and Oligofructose support the growth of these beneficial intestinal bacteria. In turn, the development of certain potentially harmful bacteria is inhibited, resulting in the positive health effects mentioned above.

The European Commission authorised a 13.5 health claim with proprietary use for our chicory root fibre inulin and the support of digestive health aspects. This allows information related to Orafti® Inulin and its function promoting digestive health to reach the consumer. The EU authorisation follows a positive opinion by EFSA and is based on new and proprietary scientific research proving that Orafti® inulin increases stool frequency thanks to its improved effect on bowel function.

Fig. 2: Orafti® Synergy1 positively affects bone mineral density.



Change in body bone mineral density of individuals whose diets were supplemented with Orafti® Synergy1 for one year.

For stronger bones: Increasing calcium absorption.

A sufficient intake and absorption of calcium can prevent osteoporosis or delay its onset. This said, only about 30 percent of ingested calcium is usually fully absorbed by the body. The Oligofructose-enriched Inulin Orafti® Synergy1 has been found to be particularly efficient in enhancing the bioavailability of calcium in the diet – an important prerequisite for lifelong bone health.

The fermentation by prebiotic bacteria increases the absorption surface for calcium in the large intestine. Several human intervention studies have shown that Orafti® Synergy1 can boost calcium absorption. And a ground-breaking long-term study has provided further evidence that increased calcium absorption actually translates into tangible improvements in bone health (see Fig. 2).



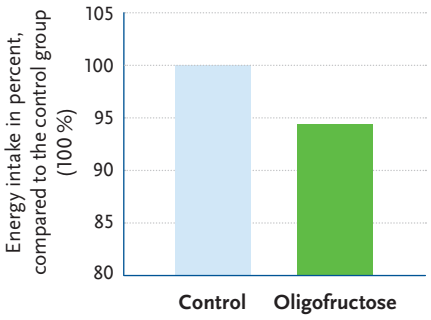
For healthy weight management: Reducing energy intake.

Obesity is one of the most pressing health challenges today. More and more people worldwide are affected. It is mainly characterised by a decrease in energy expended and a higher calorie consumption through our diet. Long-term, negative health effects include type 2 diabetes and high blood pressure.

BENEO prebiotic fibres – especially Orafti® Synergy1 and Oligofructose – have consistently been shown to help people eat less. They can not only influence the caloric density of food and contribute to reducing the calories of a single food item, they even decrease the total diet energy intake – in other words, the amount of calories we eat per day (as tested in an isocaloric study approach (see Fig. 3)).

As a consequence, positive effects have been shown in the areas of weight loss and even body fat mass reduction. Studies highlight the potential of our prebiotic fibres to maintain optimal body weight as well as fat mass and to prevent gaining weight in the long run. These scientific results suggest that both Orafti® Synergy1 and Orafti® Oligofructose offer exciting potentials as ingredients in food formulations aiming to help consumers in managing their weight.

Fig. 3: Orafti® Oligofructose can reduce calorie intake.



Effect of Oligofructose on energy intake in healthy adults.

Due to its mild sweetness profile, Orafti® Oligofructose can even be used to reduce the sugar in the final product, thus decreasing the amount of total calories: This makes Orafti® Oligofructose the ideal bi-functional ingredient for all low-calorie food products.

For a healthy lifestyle: Reducing blood sugar levels.

Because Orafti® Inulin and Orafti® Oligofructose are not digested by human enzymes in the gastrointestinal tract, they pass through the small intestine unchanged and do not release glucose into the blood stream. Therefore, these fibres can effectively reduce the glycaemic response of foods when replacing sugars or other high glycaemic carbohydrates in food formulations. **Sugar replacement with Orafti® Inulin and Orafti® Oligofructose is subject of a 13.5 health claim for a "lower blood glucose rise",** authorised by the European Commission Regulation.

Enhancing your products – the easy way.

Apart from the nutritional benefits, BENEO prebiotic fibres share a whole range of technical benefits making them applicable in many different food and beverage applications. Our fibres are applied in many dairy products like cream cheese, providing texture, body and creaminess. In low-fat yogurts they add to a soft creamy texture. And in extruded cereals or cookies, they support calorie reduction whilst safeguarding the organoleptical aspects such as taste and crunchiness. In short, Orafti® Inulin and Oligofructose can be applied in most food applications, adding valuable technical benefits.

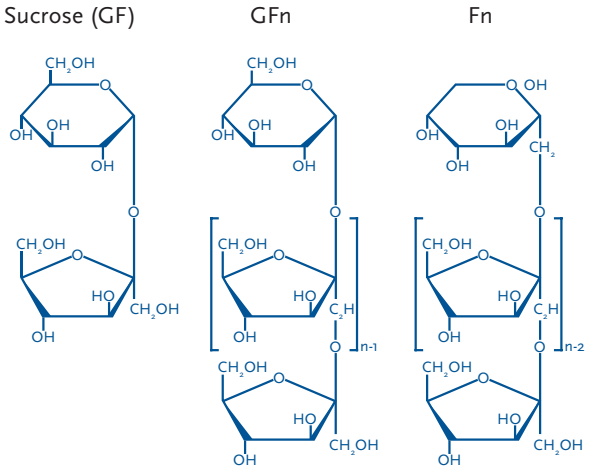
In most cases, our prebiotic fibres can be incorporated together with other ingredients without major changes in the production process of any food product. Beyond their easy processing, they offer several other important technical advantages.

For tasty light products: Replace fat with fibres.

Orafti® Inulin is a good dispersible powder which allows an easy incorporation in moist or semi-moist food categories as a fat replacer. It can stabilise water into a creamy structure with a similar mouthfeel as fat. Therefore Orafti® Inulin perfectly matches low-fat products, improving their body and mouthfeel while maintaining the same pleasure of indulgence as the full-fat option. It also improves the stability of dairy mousses and foams.

This enables product developers to replace part of the fat content with Inulin and reduce the caloric value of products without compromising on taste and texture. Application examples include dairy products such as yogurts and desserts, cold sauces such as mayonnaise and even meat.

Fig. 4: The chemical structures in comparison.



Chemical structures of Sucrose (GF)
GFn and FnG = Glycosyl, F = Fructosyl

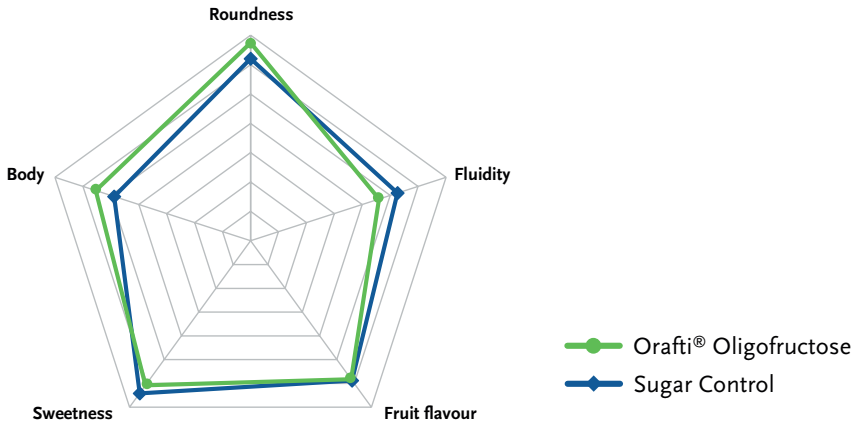
For natural goodness: Reducing sugar while increasing fibre.

Thanks to their chemical structure, these BENEO fibres have sugar-like technical properties and are therefore perfectly suitable as natural sugar reducers. Due to their natural sweetness profile, they are also often used in combination with high intensity sweeteners to create a more balanced and sugar-like palate without any off-taste.

With about 30 percent of the sweetness of sucrose, Orafti® high soluble Inulin and Oligofructose do not only offer all the nutritious benefits of fibres, but even add a mildly sweet taste to foods and beverages.

Thus Orafti® Oligofructose and Orafti® HSI are ideal ingredients in calorie- and sugar-reduced fruit preparations for yogurt or in the binding syrup for fibre-enriched cereal bars. You will also find them in ice cream, a range of baked goods and breakfast cereals.

Fig. 5: Orafti® Oligofructose in sugar-reduced fruit yoghurts.



For easy implementation: Maintaining your production process.

Both Orafti® Inulin and Oligofructose are soluble fibres. This allows easy processing without adapting or changing production processes.

Orafti® Oligofructose is even more soluble than sucrose and without doubt the most soluble dietary fibre in the world. Whenever high dosages of fibre are needed with limited water availability, Orafti® Oligofructose and high soluble Inulin ingredients are the ideal solution for easy processing. Typical examples are cereal bar binding syrups, dairy fruit preparations, fillings or baked goods such as biscuits, cakes and muffins.





Convincing in every sense.

BENEO prebiotic fibres offer a whole range of valuable benefits – for food manufacturers and consumers alike. Our range of ingredients can help you to produce healthy food products that will perfectly match today's expectations. Together, we can contribute to better nutrition and health.

Genuine advantages: How BENEO prebiotic fibres can improve your product.

Nutritional benefits

A healthy digestive system	Healthier blood sugar management	Easier weight management	Stronger bones
• Overall fibre intake • Prebiotic effect	• Lower blood glucose response	• Reduced overall energy intake	• Improved calcium absorption

Technical benefits

Easy processing	Sugar reduction	Fat reduction
• High solubility • Dispersibility	• Maintain texture • Mild sweet taste, naturally	• Better texture, creaminess & mouthfeel

Always at your side: Profit from our interdisciplinary expertise.

- Our experts have valuable insights in physiology, process technology, marketing as well as in laws and regulations.
- With nutritionists, marketers, regulatory professionals, technical food engineers and a competent sales force throughout the world, there is always a BENEO expert able to help you.
- It's the combination of advanced ingredients and specialist knowledge intertwined with access to a global network of experts, which makes BENEO a unique business partner.

Also interested in other ingredients? Discover our complete range.

The BENEO range of ingredients also includes functional carbohydrates, specialty rice ingredients and functional proteins.
Learn more about the other BENEO ingredients online: **www.beneo.com**



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