



OAT BRAN BETA-GLUCAN:

THE NEW GO-TO
NUTRITION INGREDIENT

Cholesterol Reduction | Glycaemic Response
Weight Management | Digestive Health

A NEW FORCE IN HEALTH & WELLBEING

Oat bran leads the way

Rich in beta-glucan, which is an exceptionally healthy soluble fiber, oat bran has emerged as a powerful force in the nutrition industry. Natural, easy to process, and offering multiple health benefits, it is rapidly becoming a go-to ingredient for health and wellness brands and manufacturers and health-conscious consumers worldwide.

The number of new product launches containing oat bran increased by **120%** between 2012 and 2017, according to data from Mintel. Several major companies have developed products made with oat fiber bran.

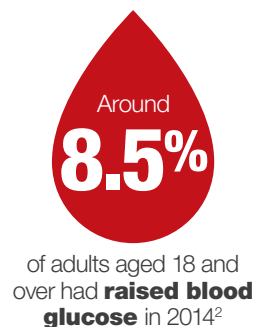
Its popularity is no surprise. Oat beta-glucan has been shown to reduce cholesterol, maintain healthy blood sugar levels after eating and to promote gut health. As a result, it is the natural choice of ingredient for cholesterol reduction and reducing the risk of cardiovascular disease (CVD), and to deliver benefits for glycaemic control and digestive health.

Approved health claims

Oat beta-glucan is the subject of approved health claims in most countries that offer detailed nutritional guidelines to their populations.

In the US, the Food & Drug Administration (FDA) officially recognized the link between oat beta-glucan and a decreased risk of CVD in 1997, making it one of the first national authorities to do so.

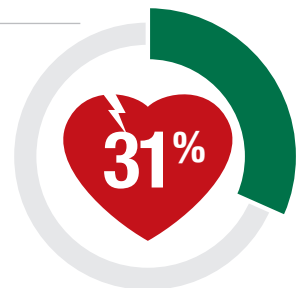
In 2006, the European Commission harmonized rules for using health claims via the Nutrition & Health Claims Regulation. The European Food Safety Authority (EFSA), which assesses health claims that fall within the framework of the regulation, awarded oat beta-glucan the highest possible level of approved health claim for foods. This was an Article 14 claim associating oat beta-glucan with a decreased risk of CVD as a result of its significant cholesterol-lowering properties.⁵



The global market for digestive health solutions is worth **\$5.7bn** – including **\$2.7bn** in North America, **\$1.2bn** in Europe and **\$1.5bn** in Asia³



31% of all deaths globally are caused by **CVD**
That's equivalent to **17.7 million deaths**⁴



In addition, EFSA recognized the high level of evidence linking oat beta-glucan with glycaemic control and approved an Article 13.1 claim for oat beta-glucan's ability to decrease blood sugar rise following a meal.⁶

Oat grain fiber containing beta-glucan is also approved by EFSA for claims relating to an increase of the faecal bulk, which means it can have a positive effect on gut and digestive health.⁷

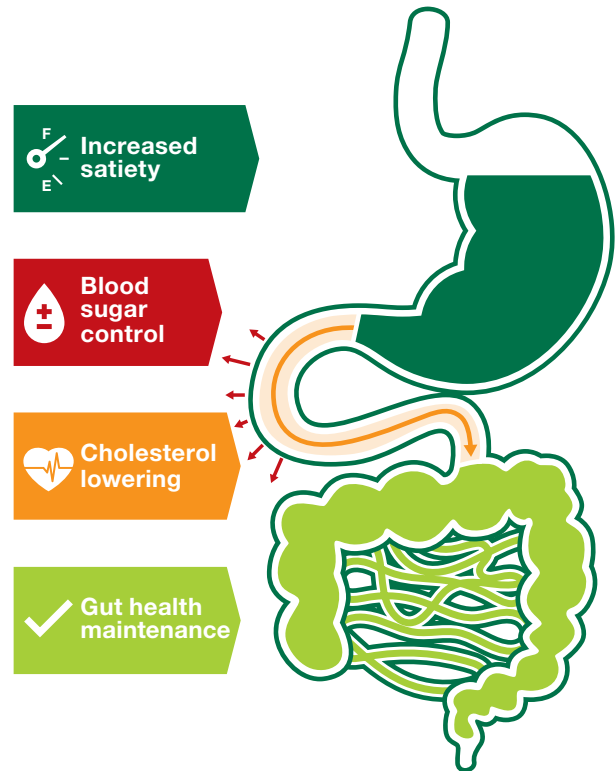
Meanwhile, in the US, FDA has now gone further than its earlier decision in 1997 and authorized the highest level of claim for oat beta-glucan and a reduction in the risk of coronary heart disease.⁸ This type of claim – Substantial Scientific Agreement – requires pre-market approval and is only granted after significant clinical substantiation dossiers have been submitted and reviewed.

SWEOAT® TAPS INTO OAT BRAN POSITIVITY

Naturex offers SWEOAT® Bran, a high-quality oat fiber bran ingredient rich in beta-glucan. SWEOAT® Bran makes it straightforward for food, beverage and health supplement companies to capitalize on the positive sentiment around oat bran and the benefits it delivers.

The beta-glucan found naturally in SWEOAT® Bran is a soluble dietary fiber. To put it in simple terms, as it enters the stomach and intestine, it forms a viscous 'mesh' that captures cholesterol-related particles so that they are not absorbed into the bloodstream and instead are passed harmlessly out of the body through the excretion of bile. During this process, the body excretes more of the 'bad' LDL-cholesterol than it does the 'good' HDL cholesterol. As a result, there is less bad LDL-cholesterol in the blood vessels, which improves heart and vascular health.


The viscous mesh created by the beta-glucan also slows down digestion and the uptake of carbohydrates into the blood stream, resulting in better glucose control. Furthermore, the mesh creates a sensation of fullness in the stomach, resulting in enhanced levels of satiety. Lastly, oat beta-glucan promotes gut health by acting like a sponge, soaking up many times its own weight in fluid. It is also a prebiotic with a good fermentation pattern. All of these benefits are contained in every gram of SWEOAT® Bran.





Sourced sustainably, processed carefully


The amount of beta-glucan naturally present in oats is about 4%, so during the production of SWEOAT® Bran, most of the starch is removed and the content of the beta-glucan increased. This unique process involves a gentle fractionation of oat kernels into oat bran that preserves the native structure and high molecular weight of the oat beta-glucan. This is important because oat bran beta-glucan's high molecular weight and good solubility are key to its functionality.


SWEOAT® Bran is extracted from high quality oats grown in Sweden and Finland in line with sustainable agricultural practices. There are tight restrictions on the use of pesticides and herbicides and full traceability is guaranteed. Thanks to a proactive and transparent relationship with growers and farmers' co-operatives, every batch of SWEOAT® bran can be traced back to the field where it was harvested.


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Regulations in Sweden and Finland ensure agriculture is conducted sustainably
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Use of pesticides and herbicides is restricted – using glyphosate on crops is prohibited
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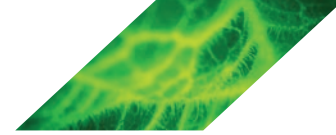
Naturex contracts farmers 1-2 years in advance, ensuring security of supply in the face of growing worldwide demand for oats
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The SWEOAT® Bran supply chain is fully traceable – right back to the farm
- 

Naturex dehulls and heat treats the oat kernels before processing to increase shelf life
- 

Gentle fractionation of the oat kernels into oat bran preserves the native structure and high molecular weight of the oat beta-glucan
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SWEOAT® Bran has certifications for FSSC22000, FDA, Kosher, Halal and Organic (EU)



POWERFUL CHOLESTEROL REDUCTION

There is a large body of clinical science supporting the ability of oat beta-glucan to reduce cholesterol. High cholesterol is considered to be a key risk factor for heart disease, so addressing this condition is highly desirable. The research also addresses how factors such as the molecular weight of the oat beta-glucan and the way in which the oats are processed can impact on oat beta-glucan's cholesterol reduction properties.

Consensus points to 3g a day

A meta-analysis of randomized controlled trials concluded that the addition of 3g or more of oat beta-glucan a day to the diet reduced LDL and total cholesterol by 0.25mmol/L and 0.30mmol/L, respectively, without changing levels of HDL cholesterol or triglycerides. This finding is reflected in the daily intake requirements enshrined in the FDA and EFSA approved health claims for cholesterol reduction, which both stipulate consumption of 3g per day to achieve the stated benefit.⁹

Oat bran's mechanism of action explained

A clinical study explored the impact of oat bran on bile acid synthesis and excretion, which is the process by which cholesterol is eliminated in the body. The results demonstrated that oat bran with native beta-glucan increased bile acid secretion within just 24 hours of consumption. This study sheds light on the mechanism by which oat beta-glucan reduces cholesterol in humans – and also how it does so very quickly after consumption.¹⁰

The importance of molecular weight

In another clinical study, it was found that the physicochemical properties of oat beta-glucan should be considered when assessing the cholesterol-lowering ability of oat-containing products. The researchers observed that daily consumption of a breakfast cereal containing 3g of oat beta-glucan with a high or medium molecular weight lowered LDL cholesterol by 5%. However, efficacy was reduced by 50% when the molecular weight was reduced further. This paper would ultimately prove highly influential in persuading EFSA to approve an Article 14.1 health claim for oat beta-glucan relating to cholesterol-lowering and a reduction in the risk of CVD. It also demonstrates that not all oat beta-glucans are the same and, in fact, a high molecular weight oat beta-glucan (such as SWEOAT® Bran) is likely to be more effective in reducing cholesterol.¹¹

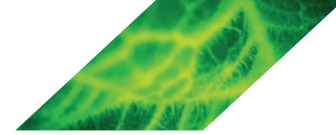
Oat bran cuts cholesterol in healthy people

Further to this, in a follow-up study, the same researchers concluded that consuming 3g of oat beta-glucan was effective in reducing LDL cholesterol in people with healthy LDL cholesterol levels. This finding demonstrates just how successful oat beta-glucan is at reducing cholesterol levels. However, it should also be noted that the researchers found that a beta-glucan with a molecular weight of at least 850,000g/mol was required for an optimal effect. In SWEOAT® Bran the molecular weight is very high – at least 2,000,000g/mol.¹²

How processing impacts on efficacy

In a review of the literature, researchers investigated how the way in which oats are processed affects their cholesterol-reducing ability. Their analysis revealed that the molecular weight of the beta-glucan played a role in cholesterol reduction, with a higher molecular weight – such as that found in SWEOAT® Bran – being more effective. They also concluded that unrefined beta-glucan rich oat-based foods, where some of the plant tissue remains intact, often appear more efficient at lowering cholesterol than purified beta-glucan added as an ingredient. This highlights the importance of careful processing in order to protect the beta-glucan and ensure it retains its benefits.¹³





OPTIMIZING GLYCAEMIC RESPONSE

Multiple studies have demonstrated that consuming oat beta-glucan is an effective way to maintain healthy blood sugar (or glucose) levels. Evidence shows it does this by reducing the human body's glycaemic response to foods containing carbohydrates, helping to avoid excessive spikes in blood sugar. This makes it the dietary ingredient of choice for common conditions such as pre-diabetes and hyperglycaemia.

Studies show that oat beta-glucan increases the viscosity of the alimentary bolus, thereby slowing gastric emptying, lengthening intestinal transit time, and delaying sugar absorption. In this process, the physico-chemical properties of the beta-glucan are important, with the best results obtained from beta-glucan that has a high molecular weight and good solubility, both of which are found in SWEOAT® Bran.

Evaluating the minimum effective dose

One study explored the minimum effective dose of native oat beta-glucan required to reduce glycaemic response after eating. It was concluded that oat beta-glucan flattens out postprandial glycaemic responses in a dose-dependent fashion. For example, 1.6g of oat beta-glucan in instant oatmeal was required to reduce blood glucose levels (iAUC) by at least 20%. In terms of a reduction in blood glucose peak rise, which is often considered to be a more relevant measure, a 20% reduction required only 0.4g of oat beta-glucan. This study raises an interesting question about EFSA's approved Article 13.1 claim for oat beta-glucan and glycaemic response, which stipulates that 4g of beta-glucan per 30g of carbohydrate consumed is the necessary dose to achieve the desired benefit. In view of more recent studies, it could be argued that efficacy can be achieved even at doses lower than those required by EFSA.¹⁴

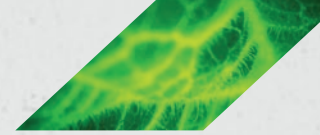
Even low doses may be enough to reduce glycaemic response

The aforementioned study was conducted after another that supports the suggestion that a lower dose may be effective in reducing glycaemic response. This paper was a review of existing human studies exploring the post-prandial blood glucose lowering ability of oats. The authors concluded that consuming intact cooked or fermented grains containing at least 3g of beta-glucan per meal was sufficient to significantly lower glycaemic response.¹⁵

Processing method impacts on efficacy

A new review of the literature explored the effects of various dietary fibers, including beta-glucan, on postprandial blood glucose response and evaluated their suitability as functional food ingredients. The paper confirmed oat beta-glucan's benefits for glycaemic response and said that no palatability issues had been reported. However, the authors highlighted the importance of processing methods in this regard, stating that there is growing evidence to show that functionality is diminished with increased amounts of processing. More research is needed, they argue, to investigate food manufacturing techniques aimed at minimizing disruptions and alterations in molecular weight and viscosity. Such techniques would preserve the beneficial properties and ensure functionality is not lost during processing.¹⁶





DELIVERING DIGESTIVE HEALTH

There is good evidence that oat fiber can deliver benefits to gut health. In fact, both FDA and EFSA have authorized claims in this area.

Multiple actions mean oat bran delivers all-round good gut health

In a review of the literature, researchers highlighted the gastrointestinal effects of oat bran fiber, stating: “In the large bowel, soluble dietary fiber increases the fermentation activity, especially production of butyric acid, enhances growth and colonisation of some probiotic bacterial strains, increases production of microbial mass and thereby aids the removal of nitrogen via faeces. It also increases wet weight of stools, thereby alleviating constipation.”¹⁷

Beta-glucan delivers prebiotic benefits

In a recent *in-vitro* digestion study, researchers explained the prebiotic mechanism of beta-glucan. They wrote: “Beta-glucan supplementation resulted in increased butyrate and *Eubacteriaceae* levels in F1 microbiota, and increased propionate and *Prevotellaceae* levels in F2. Both changes in microbial composition explain the change in metabolic profile as *Eubacteriaceae* species produce butyrate and acetate, which becomes available for cross-feeding interactions, while *Prevotellaceae* produce propionate. The increase in *Bacteroides-Prevotella* group and propionate production was also observed *in vitro* with oat beta-glucan. *Prevotella* can better ferment complex polysaccharides from the diet than *Bacteroides*, which may explain their competitive advantage upon beta-glucan supplementation.”¹⁸

SHOWING PROMISE FOR SATIETY

Several studies have indicated that oat beta-glucan may increase the feeling of satiety, thereby encouraging people to eat less and maintain a healthy weight.

Oat bran fiber and chilli deliver a synergistic effect

In one recent study, conducted using SWEOAT® Bran, volunteers who ate 20% oat fiber noodles seasoned with chilli reported the greatest positive effect on their feeling of satiety, followed by those who ate 20% oat fiber noodles with no chilli. The beta-glucan, which made up the largest part of the total oat fibers, was thought to be the main driver for this effect, confirming earlier studies. The researchers concluded that future work should focus on achieving the optimum combination of oat bran-enriched noodles and added chilli in the noodle preparation to achieve a higher satiating effect.¹⁹

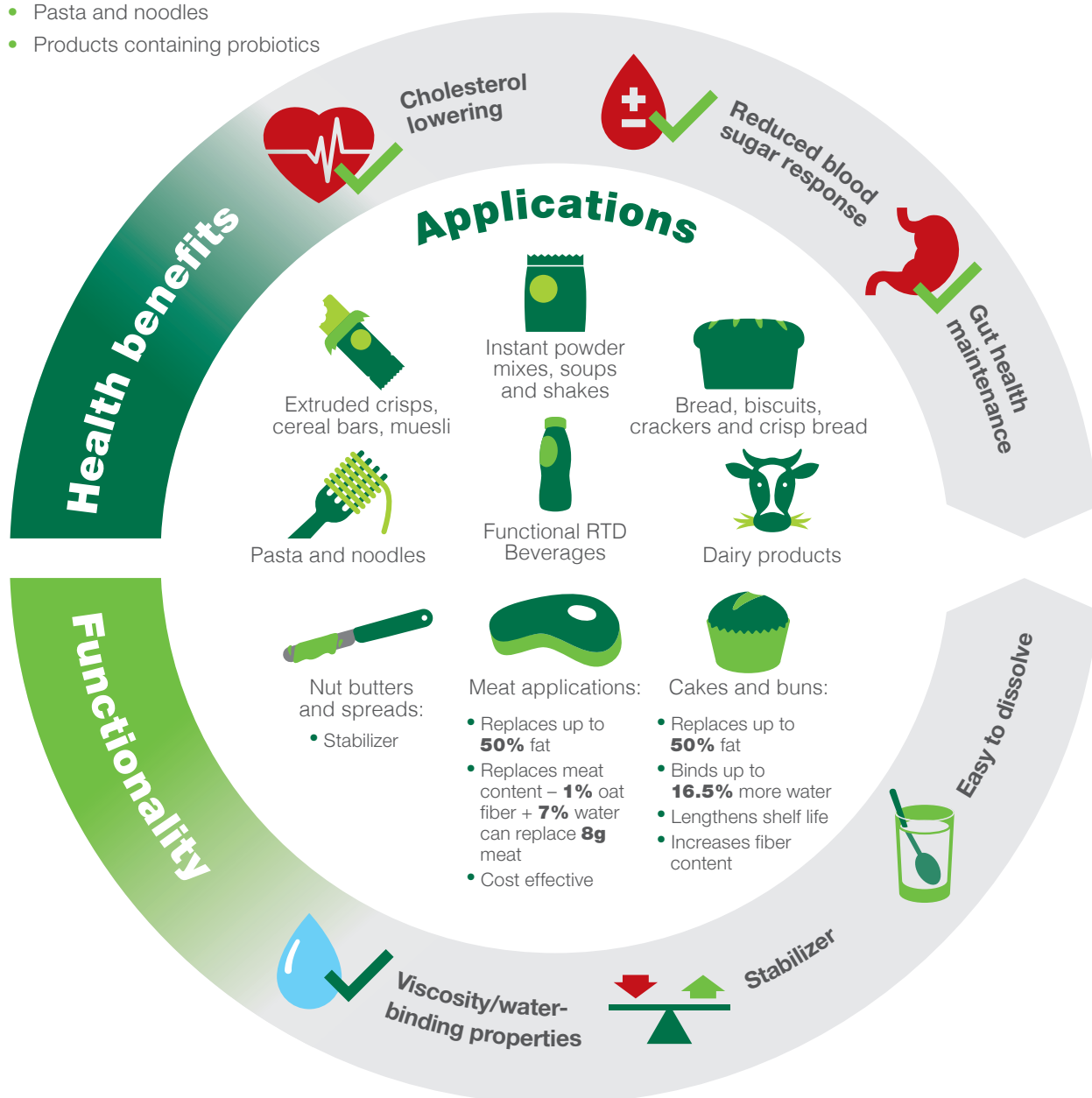


OUTSTANDING VERSATILITY AND FUNCTIONALITY

In addition to beta-glucan, SWEOAT® Bran is rich in protein with all of the essential amino acids. It also contains healthy antioxidants. It is easy to process and delivers a neutral cereal taste. Supplied as a small-particle powder (<150µg), it offers a shelf life in ambient storage of up to 30 months. These benefits mean it is a highly versatile ingredient suitable for most food, beverage and dietary supplement applications, including the following:

- RTD beverages and oat smoothies
- Baked and extruded snacks
- Bread, biscuits and crisp breads
- Breakfast cereals and cereal bars
- Instant powder mixes, including soups and shakes
- Dairy products
- Pasta and noodles
- Products containing probiotics

SWEOAT® Bran also offers multiple functional benefits in a recipe. It behaves as a natural stabilizer/emulsifier, which means it can be used to support a clean label strategy. It has high viscosity, so offers thickening properties. But it is also highly soluble and easy to dissolve in water. It has excellent water-binding capacities, with efficient cost-in-use. In bakery products, it will help to extend shelf life and create a tastier and healthier product. In fresh and cured meat applications, it delivers increased fiber content and prevents water release. It offers all of this functionality in a solution that is natural and from a source that is familiar to almost all consumers – oats.



THE COMPLETE NUTRITION INGREDIENT

SWEOAT® Bran is the complete natural ingredient solution for the nutrition category. It offers several health benefits, which are subject to authorized claims in both the US and Europe, as well as in other parts of the world. It is consumer-friendly from a labelling perspective, versatile, and delivers excellent functionality. In addition, it is produced by Naturex using the care, know-how and expertise you would expect from the world's leading supplier of natural ingredients.

Contact Naturex today to find out more about how SWEOAT® Bran could help you formulate healthy products with proven health benefits that consumers will love.

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