

The Tate & Lyle Advantage

UNLOCK THE BENEFITS OF FIBRE LIKE NEVER BEFORE

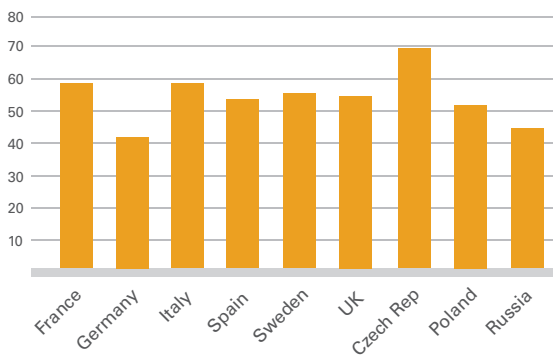


THE CHALLENGE

Decades of research have shown that diets higher in fibre are associated with a reduced risk of heart disease and diabetes^{1,2} as well as gut health and healthy digestion.³ Growing awareness of dietary deficiency, along with the health benefits consuming fibre can bring, has prompted consumers to become more conscious of food and beverage products that contain added fibre. In fact, globally, 56% of consumers say they want more fibre in their diet.⁴ Demand is growing in the world's most populous developing countries, especially those with aging populations.⁵

CONSUMERS ARE TRYING TO INCLUDE MORE FIBRE IN THEIR DIET⁶

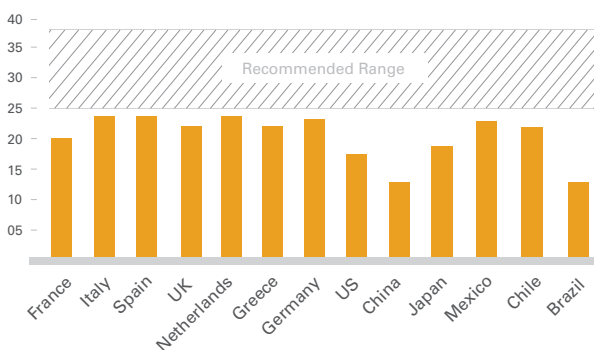
%Trying to Actively Include Fibre



Despite the desire to consume more, consumers worldwide are not getting enough fibre in their diets. Whilst different countries each have their own guidelines, the recommendation is that adults consume 25 to 38 grams per day of fibre.^{7,8} The World Health Organization suggests consuming 25 grams per day of fibre.⁹

But most individuals fall considerably short of these recommendations. In fact, the US National Health and Nutrition Examination Survey (NHANES) found that only 3% of all Americans currently meet recommended fibre intakes.¹⁰ In the UK, only 13% of women and 28% of men meet dietary fibre recommendations.¹¹

FIBRE INTAKES (G/DAY) BY COUNTRY¹²⁻¹⁸



A contributing factor to this intake gap could be the fact that consuming the recommended amount of fibre in a typical diet is difficult. For example, to obtain 25 grams of fibre from foods, a person would have to consume 13 slices of multi-grain or whole-wheat bread, 10 cups of broccoli or six medium apples.¹⁹

'Changing dietary habits, increased intake of convenience foods that are low in fibre and difficulty consuming traditional sources of fibre in the young and elderly age groups are some of the reasons why consumers are not getting the needed amounts of fibre', said Kavita Karnik, PhD., principal scientist, global nutrition at Tate & Lyle.

'However, there is an increasing awareness of the importance of fibre in the diet. Maintaining a healthy diet in the elderly population is receiving renewed attention as an important tool to maintain health and independence for a longer time. Fibres can play an important role by providing various nutritional benefits'.

OPPORTUNITIES ABOUND

The formulation of new fibre-enriched food and beverage products may make it easier for people to increase consumption of dietary fibre.

Revenue from dietary fibres is estimated to have a compound annual growth rate (CAGR) of 14.1% from 2012 to 2017.²⁰ And, importantly, consumers indicate a willingness to pay a premium for products with fibre across many categories.²¹

North America is the largest market for dietary fibre in terms of revenue, accounting for 36% of the global market in 2011.²² Asia Pacific offers the highest growth opportunities for dietary fibre-fortified products with its large, untapped market, booming food sector, rapid industrial development and low production cost.²³

But it's important to remember that whilst consumers need and want more fibre, they still value taste. Specifically, 78% of Europeans agree that taste is most important in choosing what to eat, and 75% of consumers surveyed in the US and the rest of the world cite taste as a priority as well.²⁴

TATE & LYLE ADVANTAGE

Tate & Lyle helps manufacturers capitalise on the opportunities fibre presents through a unique portfolio of fibres with diverse benefits. No matter what your fibre need, product formulation is easier because Tate & Lyle has three areas of proficiency:

- A diverse fibre portfolio
- Unmatched fibre expertise
- Production facilities around the world

DIVERSE PORTFOLIO

Manufacturers strive to create great-tasting products that address a variety of consumer needs for healthfulness. But examining possible options can be time-consuming and expensive. Tate & Lyle is a strategic partner that will work side by side with you to discover the right fibre solution that suits your unique needs.

- PROMITOR® Soluble Fibre with superior digestive tolerance*
- PromOat® Beta Glucan with superior solubility** helps to maintain healthy cholesterol levels (in Europe and other countries, it is possible to make a 'lower cholesterol' claim)***
- STA-LITE® Polydextrose: ideal for calorie reduction

*Up to 65 grams of PROMITOR® Soluble Fibre per day is well tolerated; this is more than twice the daily amount of inulin that is typically well tolerated amongst generally healthy adults: Housez B et al., 'Evaluation of digestive tolerance of a soluble corn fibre'. *J Hum Nutr Diet* 2012, 25:488. Grabitske HA, Slavin JL: 'Gastrointestinal effects of low-digestible carbohydrates'. *Crit Rev Food Sci Nutr* 2009, 49:327.

**Amongst leading oat beta glucan suppliers.

***Regulations on claims and labelling vary by country. Please consult your regulatory department.



THE 5Cs OF TATE & LYLE FIBRES

Tate & Lyle fibres address many manufacturer challenges through the five Cs for Clean formulation, digestive Comfort, health-benefit Claims, Consumer sentiment and Cost considerations.

CLEAN FORMULATION:

Tate & Lyle's portfolio of fibres offers clean taste, neutral colour and exceptional solubility, enabling you to develop products with the health benefits of fibre without sacrificing a pleasing taste experience.

COMFORT:

There's no cumulative daily intake concern when it comes to Tate & Lyle's fibres. They offer high digestive tolerance levels, so manufacturers can create great-tasting, high-fibre products without impacting consumer acceptance. Such products contribute to consumer well-being and a manufacturer's brand reputation.

CLAIMS:

Possible claims go beyond 'contains fibre,' when it comes to Tate & Lyle's fibre portfolio. From reduced sugar to digestive health to low glycaemic response, the variety of potential health-benefit claims could give your product a distinct advantage at the shelf.

CONSUMER SENTIMENT:

Tate & Lyle offers fibres with consumer-friendly labelling options to provide the appeal needed to boost product sales.

COST CONSIDERATIONS:

Using Tate & Lyle fibres provides functional efficiencies for cost-in-use advantages.

FIBRE EXPERTISE

Tate & Lyle's global team of experts works as an extension of your team to help you perfect the great taste your consumers expect. In partnership with Tate & Lyle, you will gain from extensive research conducted on consumer health trends, helping focus your product development and marketing initiatives.

'Tate & Lyle's nutrition experts work with industry leaders in research around the world to conduct well-controlled scientific studies of their products and validate the efficacy of their ingredients', said Karnik.

Whether you want to reduce fat, sugar or calories, increase mouthfeel or fibre or offer specific nutrition or health-benefit claims, Tate & Lyle can help you achieve your target.

WORLDWIDE PRODUCTION

Tate & Lyle simplifies the supply process with a global footprint that includes four fibre-manufacturing locations: Decatur/Lafayette, US; Kimstad, Sweden; Koog, the Netherlands; and Nantong, China.



‘... THERE IS INCREASING AWARENESS OF THE IMPORTANCE OF FIBRE IN THE DIET DUE TO CHANGING LIFESTYLES AND INCREASED LIFE EXPECTANCY’.

— Kavita Karnik, PhD., principal scientist,
global nutrition at Tate & Lyle

PROMITOR® SOLUBLE FIBRE: DELIVERING SUPERIOR DIGESTIVE TOLERANCE

Manufacturers are challenged to deliver the enhanced nutrition benefits of fibre that consumers demand, but some fibres, at high inclusion levels, can cause digestive discomfort.

PROMITOR® Soluble Fibre provides over two times the digestive tolerance of inulin.* Research shows up to 65 grams per day of PROMITOR® can be consumed without discomfort, which is well above the daily recommended intake of fibre.

'As many know, digestible carbohydrates provide energy to the body, but dietary fibre can provide energy to the cells of the lower digestive tract. In fact, the short-chain fatty acids produced through metabolism of PROMITOR® Soluble Fibre by the gut microbiome are a preferred energy source for cells that line the colon', said Andy Hoffman, director, wellness product development at Tate & Lyle. 'These short-chain fatty acids also lower pH in the colon, enhancing calcium absorption, which may help promote healthy bones. The slow and prolonged fermentation of PROMITOR® in the colon not only delivers healthy energy to all the cells of the lower digestive tract, but it is also the reason PROMITOR® has excellent digestive tolerance'.

PROMITOR® Soluble Fibre enables the formulation of great-tasting, high-fibre products and is available with fibre contents of 70%, 85% or 90%. PROMITOR® is also used to replace texture when sugar is reduced. It provides bulk and a desirable mouthfeel.

Some of the additional benefits of PROMITOR® are noted below:

- No impact to taste, colour or texture. It is easy to work with across a wide range of applications.
- Available in liquid, powder and agglomerated formats as well as non-GMO.
- Provides consumer-friendly labelling options.
- Replaces sugar and fat and reduces calories whilst providing bulk and desirable mouthfeel.



PROMITOR® WON THE INNOVATION OF THE YEAR AWARD WHEN FIRST INTRODUCED

'This ingredient was recognised in this way because it can be used in a wide variety of food products, from cereals and jams to soups and children's juices, or it can even be sprinkled directly on foods. The invisible fibre fortification of PROMITOR® lets the great taste and texture of foods shine through while providing improved nutritional benefits', said Hoffman.

- Offers the possibility of a variety of claims (country specific) including low glycaemic response, prebiotic benefits and increase of calcium absorption, which may help support bone health.
- Delivers exceptional process stability, with no need to compensate for fibre lost due to processing, low-pH systems and storage, resulting in attractive cost in use.

'PROMITOR® won the "Innovation of the Year" award when first introduced', said Hoffman. 'This ingredient was recognised in this way because it can be used in such a variety of food products, from cereals and jams to soups and children's juices, or it can even be sprinkled on foods. It was also recognised for the health benefits that soluble fibre offers, such as improving calcium absorption'.

*Up to 65 grams of PROMITOR® Soluble Fibre per day is well tolerated; this is more than twice the daily amount of inulin that is typically well tolerated amongst generally healthy adults; Housez B et al., 'Evaluation of digestive tolerance of a soluble corn fibre'. *J Hum Nutr Diet* 2012, 25:488. Grabitske HA, Slavin JL: Gastrointestinal effects of low-digestible carbohydrates'. *Crit Rev Food Sci Nutr* 2009, 49:327.

PROMOAT® BETA GLUCAN: UNLOCKING THE OAT BETA GLUCAN WITH SUPERIOR SOLUBILITY*

Manufacturers strive to create innovative, great-tasting foods that meet the needs of consumers who are concerned about health. PromOat® Beta Glucan is the natural soluble fibre from oats that can be used in foods and beverages that help maintain healthy cholesterol levels**, and it exhibits superior solubility without compromising consumer acceptance of taste or texture.

Other key benefits of PromOat® are highlighted below:

- Contains beta glucan content as high as 35%.
- Delivers a clean taste without grittiness, offering excellent performance in a broad range of products. It imparts a creamy mouthfeel and smooth texture due to its exceptional solubility.
- Promotes healthy post-prandial glycaemic response.
- Helps rebalance fat and calorie content due to fat-mimicking properties.
- Uses no chemicals during processing.
- Acts as a powerful emulsion stabiliser and viscosity modifier. It is acid and heat stable, improving shelf life and moisture management for some products.
- May be able to be used to create 'gluten-free' products.
- Has wide application potential, including bakery products, beverages, nutritional supplements, meal replacements, soups and sauces.
- Supplies dietary fibre, which may help promote satiety.

*Amongst leading oat beta glucan suppliers.

**Regulations on claims and labelling vary by country. Please consult your regulatory department.

35%

**PROMOAT® HAS BETA
GLUCAN CONTENT
AS HIGH AS 35%.**

STA-LITE® POLYDEXTROSE: IDEAL FOR LOW-CALORIE FORMULATIONS

Obesity has become a global problem, with 10% of men and 14% of women worldwide considered obese in 2008, compared to only 5% and 8%, respectively, in 1980.²⁵

Manufacturers challenged with lowering calories and sugar should consider STA-LITE® Polydextrose. It is an effective sugar replacer and excellent low-calorie bulking agent at only 1 kilocalorie per gram. STA-LITE® Polydextrose is ideal for foods and drinks created for weight-conscious consumers wanting to consume less sugar and fewer calories.

STA-LITE® Polydextrose helps promote healthy post-prandial blood glucose levels, producing a lower blood glucose rise after consumption compared to sugar-containing foods and drinks. It is often used in foods and beverages labelled as 'no sugar added' or 'sugar-free'.

Other key benefits of STA-LITE® are highlighted below:

- Offers 90% polydextrose without sacrificing taste, colour or texture.
- Provides excellent digestive tolerance.
- Maintains high solubility, excellent moisture control and adhesion properties.
- Provides exceptional process stability with a viscosity similar to sucrose.
- Is available in liquid and powder formats.
- Allows for easy substitution in a variety of products.
- Is commonly used in bakery, dairy, beverages, sauces and dressings.

'When you remove sugar from food to make a lower-calorie product, you can replace the sweetness with a high-potency sweetener like TASTEVA® Stevia Sweetener or SPLENDA® Sucralose, but something is needed to add back the texture that sugar provides', said Hoffman.

'STA-LITE® Polydextrose is a great choice to fill this need'.

THE ADVANTAGE

Tate & Lyle's portfolio approach to fibres gives manufacturers the option to improve the nutrition of food through the choice of many ingredients.

'Having a diverse toolkit containing both fibres and sweeteners really enables manufacturers to make great-tasting food whilst comprehensively addressing sugar and calorie reduction', said Hoffman. 'That is one of Tate & Lyle's strengths. It's not just about formulating with fibres or sweeteners in isolation, but it is about making extraordinary food with improved nutrition by using our ingredients together'.

'The diverse benefits of the Tate & Lyle portfolio of fibres can be offered to consumers based on target age group, health benefits or formulation needs', added Karnik. 'Manufacturers are taking a keen interest in this'.

CONTINUOUSLY INNOVATING HIGH- QUALITY, DISTINCTIVE INGREDIENTS

As a global provider of distinctive, high-quality ingredients, Tate & Lyle is relentlessly searching for winning innovations. Our customers come to us because they know that creating new, profitable products requires world-class ideas in ingredients, food applications and process technology. Tate & Lyle invests heavily in innovation and research to develop ingredients that add taste, texture and nutrition to products that millions of people around the world use or consume every day.

At the same time, Tate & Lyle has a robust market research program designed to provide the necessary insights on global consumer preferences. The research program enables Tate & Lyle to customise offerings and provide tailor-made solutions to local and regional markets.

Tate & Lyle has developed fibres that move consumers toward better nutrition. PROMITOR® Soluble Fibre, PromOat® Beta Glucan and STA-LITE® Polydextrose give manufacturers versatility in meeting consumer needs.

To learn more about Tate & Lyle fibres, please visit www.tateandlylefibres.com.

Regulations on claims and labelling vary by country. Please consult your regulatory department.

SPLENDA® is a trademark of Heartland Consumer Products LLC.

Sources:

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³Ibid.

⁴GfK Roper Reports, 2010; 36,183 global participants: Here is a list of food types. For each, please indicate whether you try to actively include it in your diet, you try to minimise or avoid it, or you are not concerned about it. E. Foods that are high in fibre.

⁵Natural Marketing Institute Health and Wellness Trend Survey Compendium, 2013.

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¹⁹USDA nutrient database - United States Department of Agriculture www.ars.usda.gov/nutrientdata; USDA National Nutrient Database for Standard Reference Other Databases and Reports Dietary Supplement Ingredient Database Nutritive Value of Foods.

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²⁴Roper Reports Worldwide 2011 Q1.

²⁵World Health Organization, Obesity measured as BMI > 30.