

Sugar-reduced
success with
soluble fiber



Cargill™ soluble fiber

healthy choice, clear results



[Cargill.com](https://www.Cargill.com)

© 2022 Cargill, Incorporated. All rights reserved.

Cargill® Helping
the world
thrive

Meet Cargill™ soluble fiber

Your label-friendly solution for sugar reduction and fiber enrichment

As the demand for reduced-sugars products continues to grow, Cargill has invested €38 million in its plant in Wrocław, Poland to add soluble fibers to its European portfolio of starches, sweeteners, texturizers and specialties. The Cargill™ soluble fiber product line is now part of Cargill's existing Wrocław facility. It means that we now truly offer a **complete toolbox of solutions** to help customers meet the most challenging sugar reduction targets.



Cargill's Wrocław facility in Poland

Highly innovative process

Available in both powder and liquid forms, Cargill™ soluble fiber is made using **exclusively licensed micro-reactor technology** that was developed in partnership with Germany's Karlsruhe Institute for Technology. This results in soluble fibers containing a minimum of 80% fiber content, with low color and low off-taste. In short, it's offering the great taste and appearance you need to succeed.

It can offer improved stability, easy handling, and scalability, so you can reduce sugars levels, with limited changes to your recipes.

The need for a toolbox approach to sugar[†] reduction

The sugar reduction trend continues to intensify but replacing sugars brings challenges for formulators. There is no all-in-one solution available due to the diversity of functionalities that sugars bring to food and beverages. This is where Cargill's complete sugar reduction toolbox comes in.

Cargill is well positioned with its portfolio of sweeteners and texturizing solutions to offer flexibility and customization to food formulators to replace or reduce sugars in food & beverages. This is all achieved while helping to maintain key sensory attributes like sweetness profile, taste, texture and mouthfeel and key functionalities like bulk, structure, viscosity and shelf-life.

Cargill™ soluble fiber portfolio complements Cargill's sugar reduction toolbox by offering a unique set of properties and benefits that serve as truly multifunctional label-friendly sugars replacer bulking agents. Cargill™ soluble fiber can be used in various dairy products, desserts & ice cream, baked goods, cereals, beverages and confectionery products like chocolate or candies. They could play a key role as a humectant, stabilizer and thickening agent too.



[†] Reduction of all types of caloric sugars and sweeteners

What is dietary fiber?

Cargill™ soluble fiber is fully in line with today's trends towards sugar reduction, fiber enrichment, and label-friendliness.

But some background on dietary fibers^{1,2} is important to offer some context to its value. When simply defined, “dietary fibers” are carbohydrates that are neither digested nor absorbed in the human small intestine.

They mostly originate from plants and as they are essential nutrients, they play different important physiological roles in the body such as supporting gut health or cardiovascular health. Fiber-rich foods typically contain both soluble and insoluble fiber.

Just as is the case for vitamins and minerals, fibers are essential nutrients that exert critical effects for the general support of good health, including digestion, weight management, and cardiovascular health. However, the benefits of fiber are highly dependent of their structure. Their viscosity, gel-forming ability, fermentability and water-holding capacity are all considered to be mediators of their physiological benefits.

SOLUBLE FIBER

- Dissolves in water
- Viscous and non-viscous fibers; mostly acting through their fermentation in the colon, leading to physiologically active by-products

Examples:

Resistant dextrin, polydextrose, beta-glucan, pectin, inulin, psyllium.

INSOLUBLE FIBER

- Does not dissolve in water
- Non-viscous; mostly acting by their bulking effect as they are not metabolized, leading to improvements in transit

Examples:

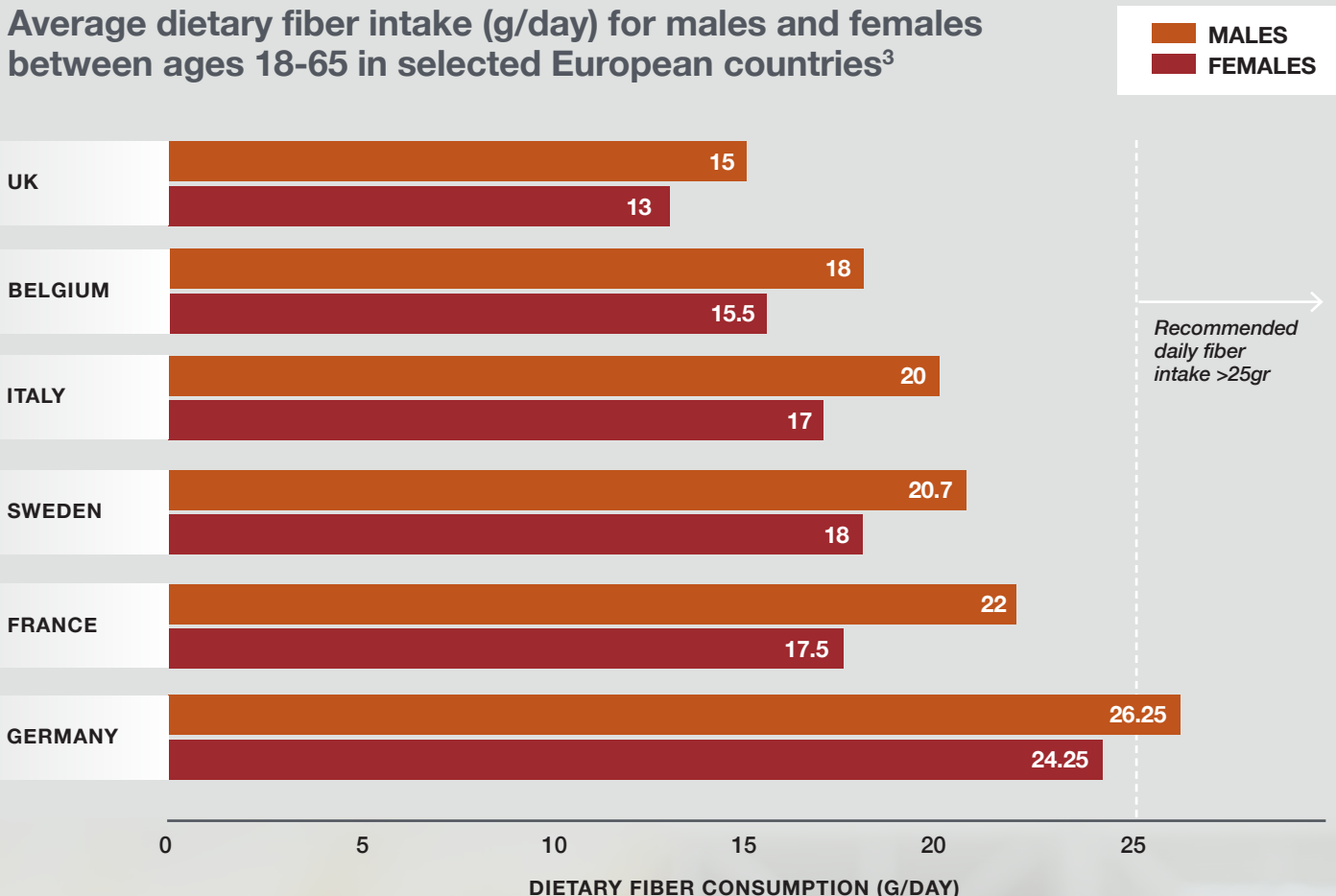
Cellulose, hemicellulose, resistant starch, lignin, wheat bran, potato fiber, micronized brans.



How much fiber do we need?

While national and regional guidelines do vary somewhat around the world, the European Food Safety Authority (EFSA) recommends fiber intake of minimum 25g per day.¹ However, this number is rarely if ever met by the average consumer.

Average dietary fiber intake (g/day) for males and females between ages 18-65 in selected European countries³



In general, typical diets across the globe do not inherently contain enough fiber to meet the 25g threshold. As a result, there may be a need to fortify with dietary fibers, in order to close the fiber shortfall.



Where can we get fiber from?



Fruits



Vegetables



Wholegrain products
i.e. bread, pasta, breakfast cereals, barley & oats, brown rice, etc.



Potato with skin



Nuts & seeds



Peas, beans & pulses



Fiber supplements (capsules)



Fiber-enriched products
i.e. food & beverage products with added fiber

Soluble fibers

are found in varying quantities in all plant foods.

Insoluble fibers

dominate in wholegrain, wheat and corn bran, nuts and seeds.

Key health trends in food and beverages

TrendTracker™ 2022: Health is on the consumer radar

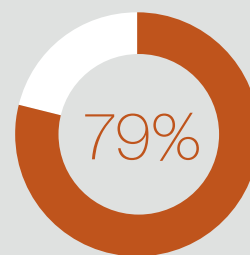
Two key trends for 2022 are:



MINDFUL EATING: More deliberate and cautious decision making is a typical consumer reaction to crisis. As a result, the pandemic has caused consumers to be even more mindful of their food and beverage choices. Consumers continue to lean into natural, and avoidance is still prevalent when it comes to ingredients – especially sweeteners.



SEEKING GOODNESS: The pandemic has accentuated the importance of actively working to maintain good health. Consumers have become even more in tune with positive nutrition, leading them to opt for food or ingredients with health benefits. Gut health continues to be top of mind, and it's being linked to other top concerns like immunity and mental wellbeing.



79%
of EU consumers
say a balanced diet
is “important”/
“quite important”
to stay healthy.

Innova Market Insights consumer
survey, 2021

Fiber answers consumer needs



SUGAR REDUCTION

The demand for products with reduced sugars only continues to rise. The COVID-19 pandemic has accelerated sweetener scrutiny, leading consumers to reduce their sugars intake. Manufacturers are resultantly increasing their efforts into further delivering products with a lower sugars content, without compromising on taste and mouthfeel.

According to HealthFocus International (2020), 52% of EMEA consumers now state that reducing sugars in their diet has become more important to them over the past year (up +2% vs. 2018), it's inspiring high product activity.

+12.4% CAGR

for product launches in Europe featuring sugars and/or calorie reduction claims.

Innova Market Insights (2016-2021)



FIBER ENRICHMENT

Manufacturers are responding to consumer interest in closing the fiber intake gap. In fact, the number of food & beverage product launches tracked in Europe featuring fiber claims ('high in fiber' and 'source of fiber') grew by 9% CAGR (2016-2021).

+12.6% CAGR **Food & beverage launches with fiber as an ingredient.**

(includes polydextrose, soluble corn, soluble wheat, inulin chicory, inulin other, chicory root fiber, oligofructose) Innova Market Insights (2016-2021)

It is important to highlight the requirements to achieve a fiber content claim in the European Union:

- A **"high fiber" claim⁴** on foods or beverages can only be made where the product contains at least 6g of fiber per 100g, or at least 3g of fiber per 100 kcal.
- A **"source of fiber" claim⁴** on foods or beverages can only be made when the product contains at least 3g of fiber per 100g or at least 1.5g of fiber per 100 kcal.

In order to achieve these fortification requirements, many products will use soluble fibers as bulking agents, since they are low in calories and sugars, and meet the growing trend towards sugar reduction.



NUTRI-SCORE IMPROVEMENT

The drive towards less sugars comes at a time in which front-of-pack labeling systems, such as Nutri-Score, are swaying consumers towards healthier options, and drawing attention to the fiber content in products.

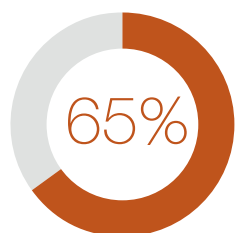
+148.2% CAGR **Food & beverage launches with Nutri-Score.**

Innova Market Insights (2019-2021)

Moreover, sugar reduction, as well as fiber enrichment helps in improving Nutri-Score.

Fiber also helps to meet the consumer demand for label-friendly solutions

Simultaneously, consumers are increasingly scrutinizing labels, and seeking out clean and clear labels.



of EMEA consumers say they are “extremely likely” or “very likely” to check the ingredient list when purchasing food and beverages.

Cargill IngredienTracker™ proprietary research, 2021

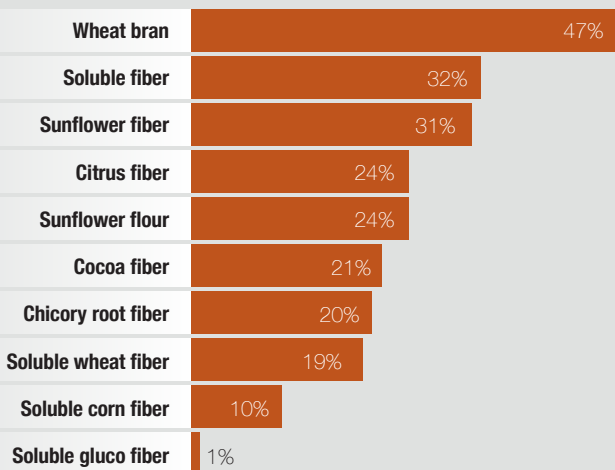


LABELING BENEFIT:

Term “fiber” has positive health perception and drives purchase impact

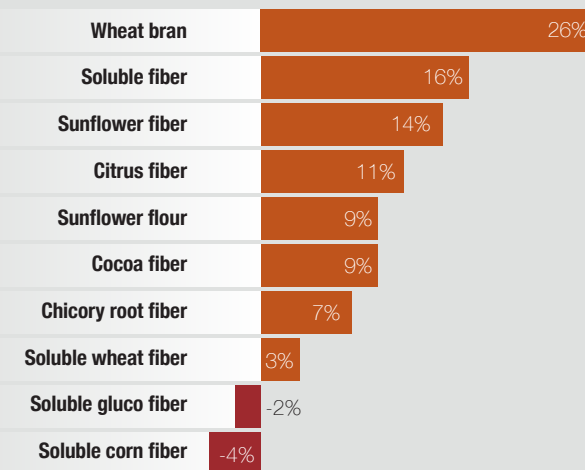
NET Health Perceptions for Fibers

NET Scores = Good For You (T2B) minus Bad For You (B2B)



NET Purchase Impact for Fibers

NET Scores = More likely (T2B) minus Less Likely (B2B)



Cargill IngredienTracker™ proprietary research, 2021
159 ingredients, 4361 consumers, 7 markets

Cargill™ soluble fiber: The right ingredient for today's trends







Amid today's market background, where sugar reduction, and fiber enrichment are top of mind, new Cargill™ soluble fiber ingredients are fully on trend.



Cargill™ soluble fiber benefits:

- **Sugar-reduced success:** Helps to achieve minimum 30% sugar reduction in a wide range of food applications.
- **Label-friendly enrichment:** Familiar ingredients that enable fiber enrichment and nutritional boost.
- **Great taste & appearance:** Provides great performance and mouthfeel in everyday products.

CARGILL'S FIBER PORTFOLIO

	Cargill™ soluble fiber CSF L80 & WSF L80	Cargill™ soluble fiber CSF P80 & WSF P80	Cargill™ soluble fiber WPD L80
Raw Material (wheat and corn)			
Format (liquid and powder)			
Type	Dextrin	Dextrin	Polydextrose* (E1200)
Labeling Options (EU)	Dextrin (fiber) Resistant maltodextrin Soluble corn/ wheat fiber	Dextrin (fiber) Resistant maltodextrin Soluble corn/ wheat fiber	Polydextrose, water

* solution of polydextrose

Fiber is essential to a daily balanced diet

Listed below are some products made using Cargill™ soluble fiber which are compared with their full sugars reference recipes:

FROM = Full-sugar reference recipe | TO = Cargill™ soluble fiber recipe

							NUTRI-SCORE CHANGE	
	FROM	TO	FROM	TO	FROM	TO	FROM	TO
 BISCUIT Portion size: 30g	6.1	▶ 4.1	145.5	▶ 141.9	0.6	▶ 2.4	A B C D E	▶ A B C D E
 CEREAL BAR Portion size: 40g	10.6	▶ 6.9	148.8	▶ 134.0	1.6	▶ 7.4	A B C D E	▶ A B C D E
 ICE CREAM Portion size: 67g	13.5	▶ 8.5	139.4	▶ 111.9	0.1	▶ 6.1	A B C D E	▶ A B C D E
 YOGURT Portion size: 125g	14.0	▶ 6.5	98.8	▶ 63.8	0.3	▶ 13.4	A B C D E	▶ A B C D E
 CHOCOLATE Portion size: 25g	11.2	▶ 6.1	148.8	▶ 134	1.9	▶ 4.7	A B C D E	▶ A B C D E
 POWDERED BEVERAGE Portion size: 13.5g + 230ml semi skimmed milk	19.9	▶ 17.2	133.5	▶ 127.2	0.9	▶ 3.2	A B C D E	▶ A B C D E

Boost your daily nutrition with fiber-enriched food & beverages

If you consume all six of these full-sugars products in one day, you will intake approximately 5.4g of fibers. However, if you opted for products made with Cargill™ soluble fiber, you could reach 35.35g of fiber. That's how easy it is to meet the daily recommended intake (>25gr)!

ALL RECIPES When consuming the portion sizes	Full-sugars reference recipe	Cargill™ soluble fiber recipe	Nutritional improvement	% nutritional improvement
Total energy (kcal)	814.7	712.7	-102 kcal	-13% calories
Total amount of fiber (g)	5.4	38.6	31g fibers	7x more fibers
Total amount of sugars (g)	75.4	50.9	22g sugars	-40% sugars

Possible health benefits of Cargill™ soluble fiber

Beyond sugars & calorie reduction, fiber enrichment and Nutri-Score improvement, Cargill™ soluble fiber may contribute some health benefits:⁵⁻¹⁰



Glycemic response

When used to replace sugars, Cargill™ soluble fiber may help to improve the post-prandial glycemic response of foods.



Gut health

Dietary fibers are recognized for their benefits on digestive health. Cargill™ soluble fiber is a fermentable fiber which may support gut health. Available evidence suggests resistant maltodextrins may be able to support normal laxation and may improve stool softness when consumed regularly. Cargill™ soluble fiber is generally well tolerated, not creating any significant gastrointestinal issues when consumed.



Bone health

Cargill™ soluble fiber may create shifts in the gut microbiota which are correlated to improved calcium absorption. This improved calcium absorption may support the maintenance of healthy bones.

Sources:

¹ EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). EFSA Journal 2010; 8(3):1462

² Stephen AM & al. Nutr Res Rev. 2017 Dec;30(2):149-190

³ European Commission. knowledge4policy website. Overview of dietary fibre intake across European countries. Consulted on October 20th, 2022 https://knowledge4policy.ec.europa.eu/health-promotion-knowledge-gateway/dietary-fibre-overview-3_en

⁴ Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods

⁵ Fastinger ND & al. J Am Coll Nutr. 2008; 27:356-66

⁶ Stewart ML & al. Ann Nutr Metab. 2010; 56:91-8.

⁷ Timm D & al. J Nutr. 2013b; 143:473-478.

⁸ Vester Boler BM & al. Br J Nutr. 2011; 106:1864-71

⁹ Housez B & al. J Hum Nutr Diet, 25(5), 488-96

¹⁰ Food and Drug Administration. Review of the Scientific Evidence on the Physiological Effects of Certain Non-Digestible Carbohydrates. 2018

Cargill™ soluble fiber

healthy choice, clear results

FOR MORE INFORMATION:

Cargill.com/food-beverage/emea/sweeteners/cargill-soluble-fiber



All information contained in this brochure is provided "AS IS" and without warranty, express or implied. Nothing contained in this brochure is intended to provide specific health, nutritional or other medical- or non-medical related advice. This brochure provides approximate nutrition information as a courtesy only and in no way guarantees the information's accuracy. Cargill cannot be held responsible for any errors, omissions or inaccuracies published. Cargill is not responsible for the outcome of any recipe or activity a user may try based on the content of this brochure. The information contained herein is subject to change without notice.

CARGILL EXPRESSLY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED REGARDING CARGILL'S SOLUBLE FIBER PRODUCTS OR TECHNOLOGY, INCLUDING WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF ANY THIRD-PARTY PATENTS. ANY AND ALL DECISIONS AS TO THE FITNESS AND IMPLEMENTATION OF THE TECHNOLOGY AND/OR RECOMMENDATIONS MADE BY CARGILL IN THIS BROCHURE WILL BE AT THE SOLE DISCRETION AND RISK OF THE USER.