

## FIBRE: GOOD NUTRITION WITH A BAD RAP

A CONCERTED EFFORT WITH THE HELP OF EDUCATIONAL INITIATIVES MUST BE MADE TO DISPEL FURTHER NEGATIVE CONSUMER IMPRESSIONS REGARDING THE BENEFITS OF FIBRE, SAYS **HENK HOOGENKAMP**, AUTHOR & PROTEIN APPLICATION SPECIALIST.

**GLOBALLY**, there is a huge fibre gap in human nutrition. Average fibre consumption has declined drastically in developed countries over the past few decades. Colonic health is affected by the amount of fibre consumed, a process by which the mucus layer responds to dietary modifications and subsequent bacterial changes. Increased consumption of dietary fibre is a powerful tool to reduce chronic inflammation.

Future dietary fibre intake recommendations for humans will increase significantly in years to come: for men, the suggested daily intake will increase from 25 to 40 grams per day; for women, it will increase from 20 to 30 grams.

### DIETARY FIBRE: "THE PROTEIN OF THE FUTURE"

Frequent consumption of highly-processed food products stripped of many naturally-occurring components has transformed a diet that does not promote a healthy gut. Very often, these "modern" food choices are low in dietary fibre and subsequently contribute to a lower diversity of microbiota. This is especially true for people

living in affluent and industrialised societies. For example, only some 10 percent of all Americans currently meet the recommended fibre intake, whereas in the UK, only 13 percent of women and 28 percent of men meet the current recommended intake of 25 grams of fibre per day.

There is growing awareness of the role of fibre in gut health, including healthy digestion. Particularly in developed countries, disorders of the digestive system are a major public health issue. It is estimated that between 10 and 20 percent of the population has symptoms of gut health conditions, such as irritable bowel syndrome, constipation, and colitis. Research has shown that diets with higher inclusion levels of fibre are associated with a reduced risk of heart disease and diabetes. Most plant fibres are natural, which allow a clean label and provide a high digestive tolerance.

Most consumers—especially women—are aware of the link between fibre and digestive health. Unfortunately, not many follow through by adjusting their diet accordingly by adding whole grains, fruits and vegetables.



## MOST PLANT FIBRES ARE NATURAL, WHICH MAKE THEM CLEAN LABEL AND PROVIDE A HIGH DIGESTIVE TOLERANCE.

Another point to consider is that a significant number of people experience one or more negative side effects when consuming high-fibre foods. These side effects might include stomach cramps, diarrhoea, bloating and gas, which might very well be a deterrent to purchase high-fibre foods.

### PERFORMANCE AND FUNCTIONALITY

Functionally, dietary fibres provide texturising properties to formulated food products. Food-fibres are not created equally, and thus, greatly differ in physical properties and organoleptic performance. Regarding functionality and performance, plant fibres deliver both water management and texture. Dietary fibres usually reduce calorie counts of meals while providing dietary support through prebiotic, probiotic or synbiotic performance, as well as regulating transition time in the dietary tract and colon.

Dietary fibres are a relatively new ingredient in the portfolio of food formulators; they are considered bioactive compounds that can either be soluble or insoluble. Soluble fibre or probiotics slow down digestion, lower LDL-cholesterol, and help to manage blood sugar. Insoluble fibre or prebiotics not only improve the health of intestines, but also decrease the risk of some cancers and kidney disease.

There is an association between dietary fibre intake and obesity. High fibre intake reduces the risk of gaining weight. This is especially true for cereal fibre, which is mainly insoluble compared to vegetable and fruit fibre, which is typically more soluble. In general, insoluble fibre has more impact on satiety than soluble fibre.

However, it is true that insoluble fibre can be a challenge for product formulators because of the “sandy” and dry mouthfeel. Also, the high degree of sedimentation makes insoluble fibre less suitable for inclusion in ready-to-drink beverages.

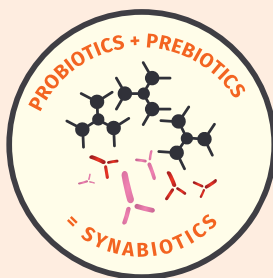
### There are three categories of dietary fibre necessary for a well-balanced diet:

**SOLUBLE FIBRE:** This water-soluble material is broken down and fermented in the colon by bacteria. While in the small intestine, soluble fibre absorbs water to become a gelatinous, viscous substance, which can maintain normal cholesterol and blood sugar levels. Soluble fibre is present in oats, barley, rice bran, fruits, beets or roots, and vegetables; it is also referred to as probiotics.

**INSOLUBLE FIBRE:** This water-insoluble fibre does not dissolve, and hence, passes intact through the intestines. This material speeds the transition or passage of foods through the digestive system, adding bulk to stool and facilitating regularity. Insoluble fibre is found in the skin of fruits, rice bran, beans, wholegrain products, seeds, and nuts. Insoluble fibre is often referred to as prebiotic.

**RESISTANT STARCH:** Compositionally a different structure than fibre but similar to soluble fibre, this type of starch resists digestion then passes intact through the small intestines, and can be fermented by bacteria in the colon.

## What are synbiotics?



**Synbiotics** are dietary supplements or functional food ingredients that contain both prebiotics and probiotics





Dietary plant fibre is increasingly being recognised as a “proactive” nutrient, considering that sufficient daily intake is linked to longevity. Although food marketing companies often portray a different picture, only a minority of consumers are interested in fibre-enhanced products with digestive claims. This is partly because an increasing number of modern consumers are separated from the natural food chain. Taste often deters consumers from eating fibre-added foods that have numerous health benefits.

The addition of dietary fibre to formulated food remains a considerable obstacle for marketers to overcome. A concerted effort with the help of educational initiatives must be made to dispel further negative consumer impressions.

**INSOLUBLE FIBRE CAN BE A CHALLENGE FOR PRODUCT FORMULATORS BECAUSE OF THE “SANDY” AND DRY MOUTHFEEL.**

#### FUNCTIONAL FIBRE PERFORMANCE

There are many different types of dietary fibres that can be used in formulated food and meat: carrageenan, rice fibre, oat bran, citrus fibre, soy fibre, beet fibre, and carboxymethyl cellulose (CMC). Not all fibres perform and function in a similar manner. Soluble dietary fibre like carrageenan forms gels when heated, and hence, can bind or entrap water. This property makes carrageenan especially useful in low-fat meat and beverages like chocolate milk. The downside of carrageenan is its high price and price volatility, with no reported conclusive evidence of health benefits. In meat analogue products like Veggie Hot Dog, CMC is often used in emulsified meat-free hot dogs because it forms a gel when heated and helps to mimic fat. CMC is often used in tandem with carrageenan and plant protein ingredients to create texture.

Oat bran, rice bran wheat fibre, potato fibre, citrus fibre and bamboo fibre are proven options for use in formulated food, bakery, and meat products. To a certain extent, these bran and fibre ingredients can successfully be used as a functional (part) replacer of plant protein ingredients. However, these ingredients are most often used as a blend to maximise performance, improve nutritional status, and reduce costs.



calcium for bone health. Insoluble cereal fibres promote stool regularity and may play a preventive role in diabetes and heart disease, providing further incentives for food manufacturers to contribute to consumers' health by fortifying food products with fibre. **APFI**

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Fibres typically employ multiple binding options like adhesion or support matrix or emulsion bonding by proteins to fat. Functional fibres may also contribute to entrapment and reduced surface tension forces created by the formula components. The resulting benefits are food emulsion structure stabilisation, reduced moisture migration, syneresis, improved ice crystal formation, improved organoleptic quality, and a clean natural food label.

These multi-functional properties of fibres provide solutions for partial replacement of high-priced ingredients or synthetic additives and complex gum stabiliser systems.

**THE FUTURE OF FIBRE**

Food manufacturers likely will bulk up fibre content to improve the nutritional status of their products. In general, fibre is moving from generic claims to more specific health claims such as prebiotic performance and even some probiotic functions associated with bifidogenic or healthy gut flora, as well as the benefits of absorption like



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