



# DIETARY FIBRE

## The digestive health star

Dietary Fibre is the indigestible part of plant foods that are resistant to digestion and absorption in the small intestine<sup>1</sup>. Dietary fibre promotes beneficial physiological effects such as laxation, reduction in blood cholesterol and modulation of blood glucose. This definition links the chemical composition of fibre to its physiological effects. Dietary fibre also includes all non-starch polysaccharides (NSP) resistant to digestion in the small intestine and is fermentable in the large intestine<sup>2</sup>.

The physicochemical characteristics of fibres include fermentability, solubility and viscosity. These properties not only influence fermentation but also the therapeutic effects of consumption<sup>3</sup>. There are two different types of fibre which have different functions and health benefits.

### **Soluble Fibre**

Soluble Dietary Fibre (SDF) are fibres that are soluble in water and forms a gel like structure by attracting water in the colon. There are many health benefits of soluble fibre such as the ability to delay gastric emptying and provide a feeling of fullness by; increasing the viscosity of gastric contents and decreasing the rate of glucose absorption in the small intestine<sup>2,4,5</sup>. Soluble fibre is effective at lowering serum low density lipoprotein (LDL) cholesterol concentrations without affecting high density lipoprotein (HDL) concentrations which reduces the risk of cardiovascular disease and coronary heart disease<sup>5</sup>. It is also well recognised that dietary fibre is important for normal laxation by increasing stool weight and stimulating bowel muscle contraction<sup>2,5</sup>.

Soluble fibres have a significant role in regulating the gut microbiota as they are readily and easily metabolised by gut bacteria. They have a prebiotic effect by influencing the abundance and diversity of the intestinal environment<sup>6</sup>.

Examples of soluble fibres include pectin's, gums and beta glucans which are found in plant foods.

Good food sources of soluble fibre include:

- Fruits and vegetables
- Nuts and seeds

- Cereal grains (especially oats, barley and rye) and psyllium
- Legumes (lentils, chickpeas, beans and peas)



### **Insoluble Fibre**

Insoluble Dietary Fibre (IDF) such as cellulose, hemicellulose and lignin are not water soluble and therefore do not dissolve in water nor form gels in the intestinal tract<sup>2</sup>. Insoluble fibres are especially effective in increasing faecal mass by absorbing water to soften stools, increase intestinal bulk and promote bowel regularity (prevent constipation)<sup>2</sup>. Insoluble fibres mildly irritate the intestinal lining which stimulates the secretion of water and mucus to encourage and increase the rate at which bowel contents move through the GI tract<sup>4,8</sup>.

Like soluble fibres, insoluble fibres also play a significant role on the gut microbiota. Insoluble fibres resist digestion in the small intestine which is then fermented in the colon where short chain fatty acids (SCFA) are produced. Research and evidence have shown that SCFAs play an important role in the maintenance of health and the development of disease by regulating mood, reducing inflammation, assist digestion, promote nutrient absorption and strengthen the immune system<sup>3</sup>.

Good food sources of insoluble fibre include:

- Wholegrain breads and cereals
- Grains (brown rice, burghal, buckwheat, quinoa)



- Bran (wheat, corn, rice)
- Fruits and vegetables (the edible skin)
- Nuts and seeds
- Legumes

### **Resistant Starch**

Resistant starch while not traditionally thought of as fibre, acts in a similar way. Resistant starch, like insoluble fibre, 'resists' digestion in the small intestine. It moves through the gut unchanged to the large intestine where it act as fuel for the microbiome and is fermented to help support a healthy digestive system and protect against gut and other diseases<sup>8</sup>.

As the fibre ferments, it acts as a prebiotic and feeds the good bacteria in the gut. Resistant starch fermentation favours the production of butyrate (bacterial metabolite) which is fundamental for keeping the gut healthy and functioning normally<sup>8</sup>. Resistant starch also offers health benefits beyond the gut such as helping to reduce risk of type 2 diabetes by increasing the body's sensitivity to insulin<sup>8</sup>.

Food sources of resistant starch include:

- Wholegrain breads and cereals including oats and barley
- Plantains and under ripe bananas
- Cooked and cooled potatoes, rice and pasta
- Legumes and lentils



### **Dietary Recommendations**

The total amount of dietary fibre that individuals need to consume each day varies according to age, gender, life stage and disease risk.

For adults over the age of 18, the Adequate Intake (AI) of dietary fibre is:

- Males – 30g/day
- Females – 25g/day

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