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By TATE & LYLE

EUOLIGO® FOS

Health Benefits of EUOLIGO®

Fructo-oligosaccharide (FOS)

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The gastrointestinal tract is increasingly recognised for its importance in determining health and wellness[1]. While we still have a lot to learn about the gut microbiota, it is nevertheless clear that a healthy gut with a high diversity of microorganisms, including a significant proportion of beneficial species, may help to protect us from infection and chronic diseases[2]. In contrast, gut dysbiosis - where diversity is low or there is an imbalance of species – can increase the risk of infection and chronic diseases[3].

Studies over the past decade have discovered that certain dietary interventions can shift the gut microbiota towards a healthier balance.

These include high-fibre diets and prebiotics[4,5]. A prebiotic is “a substrate that is selectively utilised by host microorganisms conferring a health benefit”[6,7].

Several studies have demonstrated the prebiotic characteristics of FOS[8,9,10].

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Introducing FOS

FOScan befoundnaturallyin plants, including onion, artichoke and wheat.

EUOLIGO® FOS is an ingredient produced enzymatically[11].

FOS are mostly not digested in the upper intestine; hence, they act as dietary fibres and are considered low in energy[12].

Potential benefits:

FOS are not broken down by digestive enzymes, so they reach the colon intact where they are fermented by favourable bacterial species such as Bifidobacteria into short-chain fatty acids (SCFA) and other metabolites[12].

Studies suggest SCFA have positive health effects, such as strengthening the gut barrier[13], which may lead to a potentially beneficial impact on immunity, a favourable glycaemic response,[14,15] reducing gut pH13, and increasing mineral absorption[16].

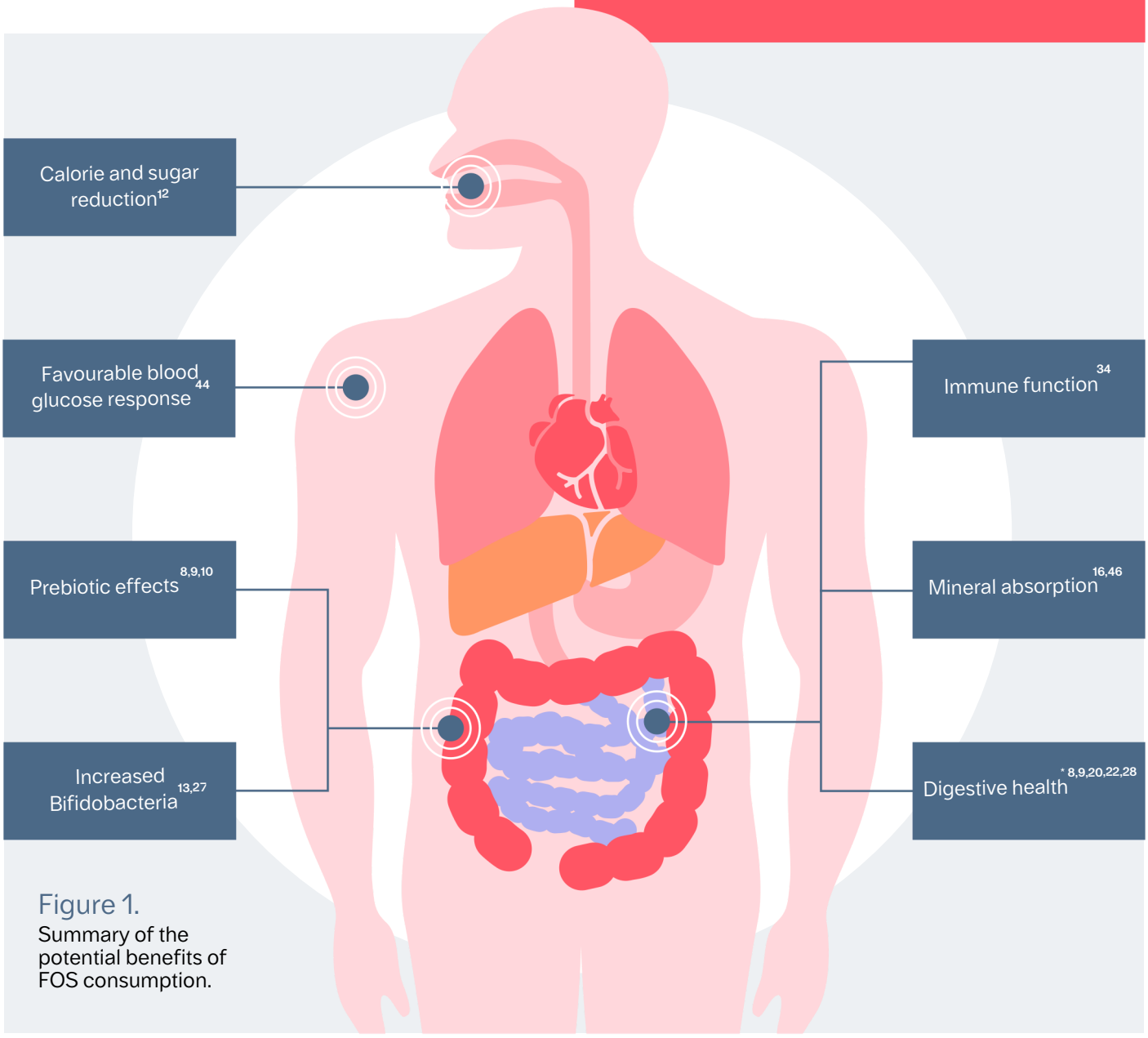

Figure 1.
Summary of the potential benefits of FOS consumption.

*Stool frequency, stool bulk, or stool consistency.

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Digestive health

Constipation is a common complaint, affecting 14.4% of children[17], 15.3% of adults[18], and 18.9% of older adults[19] globally."

FOS has a bulking effect on stools helping them to be passed more easily by the body[20]. Studies in healthy adults and adults with constipation show that adding FOS to the diet helps to increase stool frequency[21,22] or bulk and improve stool consistency[23] as well as boosting numbers of more favourable bacterial species, such as Bifidobacteria[24,25].

Research findings:

Healthy, young adults who were given yoghurts and snack bars containing FOS doubled their dietary fibre intake and reported a more regular stool frequency[26].

In a study in nursing homes, constipated elderly residents given FOS passed stools more easily and boosted their gut levels of Bifidobacteria[27].

Another study, in which healthy adults consumed FOS daily in muffins, reported improvements in stool consistency without an increase in frequency[28]. Daily doses of 10-20g FOS appear to be well tolerated[29,30,31,32].

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Immune function

The gut has a major role in immune function, not only by providing a physical barrier to pathogens, but also via interactions between the gut microbiota and immune cells.[33]

In one study, older people were given 8g of FOS daily and followed up for three weeks. The results showed an increase in Bifidobacteria and a positive impact on immune function, expressed as increased numbers of key immune cells and a decrease in one type of inflammatory marker[34].

FOS may induce positive immune effects as a consequence of its selective stimulation of favourable types of microorganisms[35]. Bifidobacteria - a key species which ferments FOS – are known to release SCFA, which may strengthen the gut barrier[36] and lower the pH inside the gut13. As pathogens typically prefer environments with a neutral pH, they are less likely to thrive[37].

SCFA also support immune function by positively influencing toll-like receptor signalling and control of inflammation[38]. Toll-like receptors are immune cells responsible for identifying pathogens and launching an inflammatory response which attracts other types of cells that can ‘attack’ the pathogen.

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Favourable Glycaemic Response

Impaired glucose tolerance is an important risk factor for type 2 diabetes[42]. Hence, diet and lifestyle strategies to improve glucose tolerance can lower the risk of type 2 diabetes[43].

Studies show that adding FOS to the diet can support a favourable glycaemic response. In two studies in healthy adults, replacing the sugar (sucrose) in dairy desserts with FOS resulted in a significant decrease in post-meal blood glucose and insulin compared with a regular dessert[15,44].

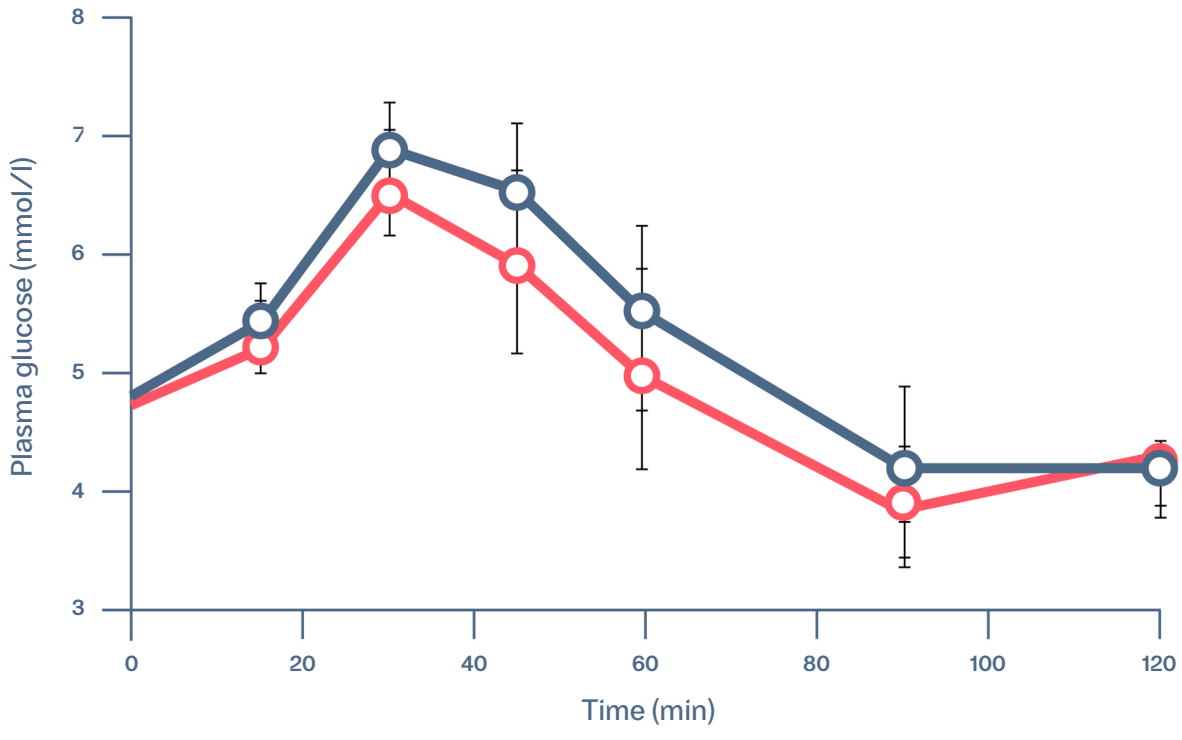
Type 2 diabetes is a growing issue globally.

In 2021, there were 529 million people living with diabetes worldwide[39]. By 2050, more than 1.31 billion people are projected to have diabetes worldwide[39].

Type 2 diabetes, which makes up 96% of diabetes cases, is preventable and sometimes reversible if identified and managed early in the disease course[39-41].

Figure 2.

Post-mealplasma glucose curve following consumption of a dairy dessert with sucrose (slate circles) versus the same dairy dessert with FOS (coral circles); Adapted from Reference[15].



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Mineral absorption

Prebiotics, such asFOS, have been found to increase the uptake of some minerals[16].

Benefits were particularly seen for post-menopausal women, a group with a higher risk of bone mineral depletion due to estrogen deficiency.

Individual intervention studies using intakes of 10g FOS per day have reported increased copper[45] and magnesium[46] absorption in post-menopausal women.

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