

# HyFIBER<sup>®</sup>



## White Paper

This information is intended for  
healthcare professionals only

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## Introduction

The beneficial effects of dietary fibre on gut health are widely recognised; however, fibre intakes in the UK are often inadequate with few people achieving recommended targets. Inadequate fibre intake can contribute to bowel transit disorders such as constipation; a condition which affects many people in the UK and contributes significant costs to the NHS.

For some patients there are barriers to achieving an adequate fibre intake, either through normal diet or enteral tube feeding, and fibre supplements can be beneficial in supporting individual to increase their fibre intake.

## Background

It is well established that dietary fibre is an essential component of a healthy diet. A diet higher in fibre is associated with a lower incidence of a variety of conditions such as cardiovascular disease, coronary events, type 2 diabetes mellitus and colorectal cancer. Dietary fibre also has a beneficial effect on constipation, decreasing intestinal transit times and increasing faecal mass.<sup>1</sup>

According to the Scientific Advisory Committee on Nutrition (SACN) the dietary reference value (DRV) for dietary fibre for adults is 30g/day.<sup>1</sup> Statistics show that fibre intake is inadequate for most of the UK adult population with only 9% of 19–74-year-olds, and 3% of those aged 75 years and over meeting the DRV, with deficits in fibre intake of between 10.3 and 12.7g per day. These inadequacies in fibre intake are also mirrored in children.<sup>2</sup>

Constipation is a significant economic burden to the National Health Service in the UK. With constipation affecting both the physical and mental health of patients, it is estimated that £168 million was spent by NHS England on treating constipation in 2018/19 alone.<sup>3</sup>

Inadequate dietary fibre intake can contribute to constipation<sup>4</sup> and increasing dietary fibre is one aspect of the diet and lifestyle changes recommended as first line management of constipation.<sup>5,6</sup> Several large cohort studies have shown positive associations between higher intakes of dietary fibre and both stool frequency and prevalence of constipation.<sup>8,9</sup> Numerous systematic reviews have also demonstrated that fibre supplementation has beneficial effects on stool frequency and consistency.<sup>10,11,12</sup>

In addition to its beneficial role in managing constipation, soluble fibre can also be beneficial in the management of diarrhoea. The water holding capacity of non-fermentable soluble fibres, whilst softening hard stools can also help to firm up loose stools.<sup>13</sup> Additionally, short chain fatty acids (SCFAs) produced from the fermentation of fibre can stimulate water and sodium absorption in the colon, which may have a beneficial effect on diarrhoea.

## What is HyFIBER?

HyFIBER is a low volume, ready to use liquid fibre supplement containing 12g of soluble fibre in each 30ml serving. HyFIBER is a concentrated source of soluble fibre (12 g/30 mL serving) utilising a combination of polydextrose and fructooligosaccharides (FOS) for the dietary management of bowel transit disorders. Polydextrose is slowly and partially fermented with around 50% excreted in the faeces,<sup>15,16,17,18</sup> whereas fructooligosaccharides, are rapidly and completely fermented by the microbiota of the large bowel.<sup>15,19</sup> Both soluble fibre sources have a beneficial effect on bowel function.

HyFIBER is a Food for Special Medical Purposes, for use under medical supervision and is ACBS approved for the dietary management of bowel transit disorders. In addition it is fat free, low in electrolytes, low in volume and is naturally water thin (IDDSI Level 0). If taken orally it can be consumed straight from the packaging or bottle, no pre-mixing required, or it can be mixed into hot or cold, food and drinks. For enteral use, HyFIBER should be administered using a suitable enteral feeding syringe, and the tube should be flushed with suitable water before and after administration.

HyFIBER is allergen free, suitable for vegetarian and vegan diets and contains no ingredients that are restricted for those following Halal and Kosher diets (although not certified kosher).

## HyFIBER: The Science

### Polydextrose

Polydextrose is a water-soluble polymer of glucose that is widely used across most sectors of the food industry and has a reported energy value of one calorie per gram.<sup>20,21</sup> Studies looking at the use of polydextrose in bowel health have shown that

it increases faecal bulk, increases stool frequency, and improves stool consistency.<sup>22, 23, 24, 25</sup> It is also recognised that polydextrose may have prebiotic potential.<sup>20</sup>

Polydextrose resists hydrolysis by digestive enzymes in the small intestine and reaches the colon intact. In the colon polydextrose is slowly and partially fermented by gut bacteria, with up to 60% excreted in the faeces. It has been widely demonstrated to be well tolerated in human intervention studies, likely owing to its gradual fermentation in the gut.<sup>20</sup>

Several studies evaluated the effect of polydextrose in constipated individuals. Shimada, et al<sup>24</sup> investigated the effect of polydextrose on constipation in Japanese haemodialysis patients. The 2-arm parallel study compared 0 g/day to 10 g/day of polydextrose. The primary outcome measure was stool frequency which significantly increased from 3 times per week to 7.3 times per week. Stool frequency also was significantly improved compared with control (7.3 vs. 4.5,  $p < 0.05$ ). Ibarra, et al<sup>25</sup> completed a 4-arm study (0 g, 4g, 8g, 12g polydextrose/day for 2 weeks) in 192 functionally constipated patients. The group that consumed 12 g/day of polydextrose significantly increased their stool frequency by more than 2 bowel movements per week compared to placebo. These improvements were accompanied by a greater reduction in the degree of straining and a higher proportion of complete bowel movements after 2 weeks of consuming 8 or 12 grams polydextrose.

### Fructooligosaccharide (FOS)

FOS are indigestible short chain fructan compounds which are found in a wide range of foods and are widely recognised for their prebiotic potential. Studies looking at the effect of fructans on bowel function have found that they can increase stool frequency and improve stool consistency.<sup>26, 27, 28</sup>

In contrast to polydextrose, which is slowly and partially fermented, FOS is rapidly and completely fermented by the microbiota in the colon.<sup>29, 30</sup> This stimulates the growth of beneficial bacteria, results in the production of SCFAs, decreases luminal pH, as well as increasing microbial mass.<sup>31</sup> SCFAs can influence the physiology of the colon and promote colonic motility.<sup>32, 33</sup> Despite their rapid fermentation, studies show that daily doses of up to 10-12g of fructans do not generally result in significant gastrointestinal symptoms.<sup>26</sup>

A systematic review of 47 studies found that stool frequency, stool consistency and stool wet weights were significantly increased after supplementation with short chain  $\beta$ -fructans.<sup>26</sup>

A recent prospective, non-comparative, interventional study evaluated the effect of a product containing both polydextrose and FOS, on constipation in children. The product, which contained 4.17g polydextrose and 0.45g FOS, was taken daily for 45 days by 77 children (4-8 years). During the intervention there was a significant progressive increase in the weekly frequency of bowel movements, and a significant reduction in children with fewer than three bowel movements per week, defecation of Bristol type 1 and 2 stools, pain on defecation, fear of defecation, and abdominal pain. A significant reduction in faecal pH was also seen.<sup>34</sup>

## Conclusion

In summary, HyFIBER can be beneficial in the following situations to support patients to increase their fibre intakes and support the dietary management of bowel transit disorders:

1. To support the management of bowel transit disorders such as diarrhoea and constipation
2. To supplement fibre intake for patients who are unable to meet fibre requirements due to dietary restrictions e.g., renal patients
3. To supplement fibre intake for patients requiring enteral tube feeding, where fibre containing feeds are not available, or contain inappropriate amounts or types of fibre, or as a cost saving to fibre containing feeds
4. To supplement fibre intake for patients requiring ONS, where fibre containing ONS are unavailable or provide inadequate fibre, or as a cost saving to fibre containing ONS
5. To supplement fibre intake alongside other methods of oral nutrition support such as dietary modification, food fortification and homemade high protein and energy drinks
6. To supplement fibre intake for patients who require texture modified foods which may restrict fibre intake
7. To demonstrate the beneficial effects of increased dietary fibre and motivate patients to increase their fibre intake through their diet.

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