



Beyond

Conscious Nutrition and Natural Health

NUTRITION

A Beyond Nutrition Publication

Autumn 1998 £2.50

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ANSWERED**

What is all the fuss about FOS?

By Susan Perry

In recent years, researchers have discovered a soluble fibre in certain vegetables and fruit, called FOS, that can act as a food for the beneficial bacteria of the intestines but cannot be digested or absorbed by the body. Because of this unique facility, FOS, or fructo-oligo-saccharides (pronounced fructo-oligo-sack-ah-rides), are proving ideal for improving or maintaining the condition of the intestines, which in turn have a vital influence on our whole health.

Once past the stomach, food travels down a good 30 feet of intestines as our digestive processes gradually break it down and absorb the nutrients that we

need. However, in a healthy digestive system our intestines are also populated by a natural 'microflora' which assist the process of digestion and provide many other services. The microflora consist of an estimated 400 species of micro-organisms such as the well known bacteria, Lactobacillus acidophilus, and the bifido-bacteria. The presence of a healthy microflora keeps the lining of the intestines healthy and allows the optimal absorption of nutrients from our food.

However when we eat we also take

in unknown fellow travellers, including viruses, yeasts and fungi, parasites and pathogenic, or harmful bacteria. Our first line of defence against these is the acid secreted by the stomach during digestion. But there is another important way we can protect ourselves from the many threats that arrive with our food.

Microflora may need help

Under normal conditions the microflora can out-compete the small number of harmful organisms that reach the intestines. However, when the production of acid in the stomach is reduced, one of the body's major primary defence

mechanisms is reduced. Potentially harmful bacteria, parasites, viruses and yeasts, naturally present in our food and environment, are not struck down in the stomach and the delicate balance of the natural microflora may be compromised. Once these pathogens become established, a condition called 'gut dysbiosis' can set in, and the healthy balance of the natural flora that gently cared for and nourished the intestines is lost.

Instead, the lining of the digestive tract may be exposed to harmful chemicals, acids and gases produced by the new residents. The intestinal lining can become weak, inflamed and eventually damaged, a condition now called 'leaky gut'. As a result of this damage, actual holes can appear in the walls of the intestines and toxins and undigested food particles and pathogens can pass through these gaps and get into the blood stream.

The body launches an immune response to these toxins and activates certain detoxification pathways, processes that exact a high cost from the body, using up vital antioxidant nutrients and energy. If the natural balance of the gut flora is not restored and the integrity of the lining repaired, then conditions such as chronic fatigue, food allergies, IBS, constipation, diarrhoea and lowered immunity may become established.

Restoring microflora balance with FOS

Tackling dysbiosis and any of the conditions that may result needs to start with adequate stomach acid, since full digestion cannot

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take place without it (*see Passing the acid test, page 10*). Taking a supplement of betaine hydrochloride may be necessary, at least for a while. However, although increasing stomach acid will reduce the intestine’s exposure to harmful micro-organisms (as many are killed on exposure to acid) this strategy will not single-handedly restore the balance of the natural microflora.

One approach to the process of re-population is the use of a non-digestible fibre such as FOS. FOS is a naturally-occurring carbohydrate found in onions, garlic, chicory root, leeks, sugar cane, Jerusalem artichokes and asparagus. When eaten FOS is not digested or absorbed in the stomach or small intestine but travels through into the colon. The health benefits of FOS are thought to be due to its unique fermentation properties. Studies have shown that FOS selectively feeds the beneficial lactobacilli (such as *lactobacillus acidophilus*, *lactobacillus sporogenes* and *lactobacillus salivarius*), and the helpful bifido-bacteria in the large intestine (colon), while pathogens such as *E.coli*, clostridia and salmonella are unable to feed on FOS.

As the beneficial bacteria flourish, the pathogens are suppressed and the level of toxic by-products (such as indols and phenols) are reduced. As bowel toxicity is lowered the detoxification pathways in the liver are freed up, which improves the body’s immune status. Also, as the bifido-bacteria in the colon

ferment their ‘FOS feed’ they produce healthy by-products like B-vitamins, anti-microbial substances and organic acids, creating a beneficial environment for the lining of the colon. Organic acids such as butyric acid, produced by happy bifido-bacteria, have been shown to be protective against colon cancer.

Clinical studies

Clinical studies continue to reveal the positive health benefits of FOS. Studies have linked increases in bifido-bacteria population in the gut, due to FOS supplementation, to benefits such as an increased bio-availability of calcium, lower cholesterol and triglyceride levels, and improved glucose tolerance. FOS also increases transit time (the time food takes to go from one end of us to the other) which reduces constipation and dysbiosis, and an increase in the volume and water content of intestinal material. FOS has even been linked to preventing the ‘ulcer’ bacteria, *Helicobacter pylori*, from attaching to the walls of the stomach or small intestine.

As a third line of healing, after restoring stomach acid and feeding the microflora with FOS, steps need to be taken to repair any damage to the digestive lining (i.e. ‘leaky gut’) caused by dysbiosis. One of the best natural ways to do this is to take 2-5 grams of the amino acid, glutamine, until the condition improves. Glutamine is the primary fuel of this lining and can help it repair itself.

The overall combination of

these healing factors can lead to the relief of digestive disturbances such as flatulence, bloating, diarrhoea and constipation. Since the health of the digestive tract affects the health of the entire body, one can expect an increase in the general health of the body as digestive symptoms are lifted and the balance of the protective natural micro-flora is restored.

What is the best way to supplement FOS?

FOS is a powder with a pleasant sweet taste that can be added to food or drinks. It can also be added to hot drinks or used in cooking. Although FOS tastes sweet it does not contribute to the daily calorie intake, since it is not digested or absorbed by the body, so it is perfect for those on a sugar-free or calorie controlled diet. It is advisable to supplement with a probiotic, *L.acidophilus*, *L.sporogenes*, *L.salivarius* and/or bifido-bacteria for at least three days before starting to take FOS. This delivers an initial boost of beneficial bacteria to the intestines.

Signs of Gut Dysbiosis

- bad breath
- coated tongue
- flatulence
- bloating
- diarrhoea
- constipation
- IBS
- acne/skin infections
- headaches/migraines
- thrush
- athletes foot
- fatigue
- frequent infections
- poor concentration
- chemical sensitivities
- depression