



Prebiotics: A Consumer Guide for Making Smart Choices

Developed by the International Scientific Association for Probiotics and Prebiotics (www.isapp.net)

Dietary prebiotics are selectively fermented, dietary ingredients that result in specific changes in the composition and/or activity of the gastrointestinal microbiota, thus conferring benefit(s) upon host health. Other prebiotic approaches may target further human or animal ecosystems such as skin, oral cavity and vaginal tract. A prebiotic targets the microbiota already present within the ecosystem, acting as a selective 'food' for the target microbes with beneficial consequences for host.

Why look for products with prebiotics? Certain prebiotics, when used in adequate amounts, have been shown to provide health benefits including improved digestive functions (e.g. bowel regularity, resistance to gastroenteritis, pathogen inhibition); positive modulation of immunity, including anti-inflammatory effects; generation of beneficial microbial metabolites, such as pathogen inhibitors; improved markers of insulin resistance and lipid metabolism; and better absorption of certain dietary minerals such as calcium. Prebiotics can complement probiotic functions, although currently the strength of evidence for probiotics significantly exceeds that of prebiotics.

What makes a good prebiotic? Currently 3 criteria are required for a prebiotic effect:

(1) Resistance of the prebiotic to degradation by mammalian enzymes or hydrolysis; (2) fermentation (breakdown, metabolism) of the prebiotic by microbes; which elicits (3) a selective stimulation of the growth and/or activity of beneficial indigenous microorganisms. Obviously, safety of the ingredient is required and good sensory properties desirable, where applicable. Stability to heat, drying, and room temperature storage are desirable prebiotic properties. A daily dose of 5-8g/d fructooligosaccharides (FOS) or galactooligosaccharides (GOS) has a dietary prebiotic effect in adults.

Which prebiotics are in the marketplace? As the main reason for using a prebiotic is to provide benefits through gut bacteria, the most tested prebiotics are directed towards bifidobacteria and (to a lesser extent) lactobacilli. Future prebiotics may promote other beneficial gut organisms (for example, eubacteria, propionibacteria, faecalibacteria or roseburia). The most widely accepted prebiotics are FOS and GOS. To confirm prebiotic effects, well conducted human trials are required. Consumers should look for the labels FOS, inulin (a type of FOS), GOS or TOS (*trans*GOS). There is a growing list of *further* prebiotics such as polydextrose, soybean oligosaccharides, isomaltoligosaccharides, gluco-oligosaccharides, xylo-oligosaccharides, palatinose, gentio-oligosaccharides, some starch derivatives and sugar alcohols (such as lactitol, sorbitol and maltitol). However, the evidence for these, especially in humans, is not as well advanced as it currently is for FOS and GOS.

When is an ingredient NOT a prebiotic?

- When it is degraded by human/animal processes in the target ecosystem (e.g. in the gut by stomach acid, or small bowel secretions).
- When it is fermented but not selectively so. To be selectively fermented, only a small number of beneficial bacteria should ferment the prebiotic – not a large number of microbes with ill-defined health effects.
- When it has only been tested in the laboratory, and not in vivo.
- When it is not adequately defined chemically and may contain impurities that are not part of its prebiotic properties
- When it is not administered in sufficient amount to confer a measurable benefit.

Many food ingredients are being touted as prebiotics when in reality they are not. Most of these omit the selective fermentation that is a prerequisite.

Are prebiotics dietary fibre? Both fibre and prebiotics are typically non-digestible carbohydrates, and both are fermented by gut bacteria. However, a prebiotic differs from fibre in that it needs to be *selectively* used in the gut – by only beneficial members of the existing gut microbial community. Some manufacturers refer to prebiotics as fibre, because the latter is more familiar to consumers.

What foods can I find them in? Some dietary prebiotics occur naturally in foods such as leek, asparagus, chicory, Jerusalem artichoke, garlic, artichoke, onion, wheat, banana and oat, as well as soybean. However, it would take a large quantity of these foods for their active oligosaccharides to exert a useful prebiotic effect. A more realistic method involves fortifying popular foodstuffs with defined amounts of prebiotics. Thus, you will find that dietary prebiotic compounds are now added to many foods including yogurts, cereals, breads, biscuits, milk desserts, nutritional supplement bars, ice-creams, spreads, drinks, water, infant formula, as well as to some animal foods. They are also available as powdered, gum or liquid supplements.

ISAPP is an association of academic and industrial scientists involved in research on fundamental and applied aspects of probiotics and prebiotics. For more information, see www.ISAPP.net.

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