

A prebiotic is a substrate that is selectively utilized by host microorganisms conferring a health benefit. To date, most prebiotics are used as food ingredients or supplements and are active in the gut. But they may also target further human or animal microbial ecosystems such as those on the skin, oral cavity and vaginal tract. A prebiotic targets resident microbiota, acting as a selective 'food' for 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 function (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 (as synbiotics), although currently the strength of evidence for probiotics 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, absorption or hydrolysis;
2. A selective stimulation of the growth and/or activity of beneficial indigenous microorganisms;
3. A demonstrable beneficial health effect.

Obviously, safety of the ingredient is required and good sensory properties are desirable, where applicable. Stability to heat, drying, and room temperature storage are also desirable prebiotic properties.

Which prebiotics are in the marketplace? The main reason for using a prebiotic is to provide benefits through resident microorganisms. The most tested gut prebiotics are directed towards bifidobacteria and (to a lesser extent) lactobacilli. Future prebiotics may promote other beneficial organisms (for example, *Propionibacterium*, *Faecalibacterium*, *Akkermansia* or *Roseburia*). A daily dose of 5-8g/d fructooligosaccharides (FOS) or galactooligosaccharides (GOS) has a dietary prebiotic effect in adults, and these are currently the most widely accepted prebiotics. Consumers should look for the labels FOS, inulin (a type of FOS), GOS or TOS (*trans*GOS). To confirm prebiotic effects, well conducted human trials are required. There is a growing list of candidate prebiotics such as polydextrose, soybean oligosaccharides, isomalto-oligosaccharides, gluco-oligosaccharides, xylo-oligosaccharides, palatinose, gentio-oligosaccharides, polyphenols, some starch derivatives and sugar alcohols (such as lactitol, sorbitol and maltitol).

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 utilized but not selectively so. To be selectively utilized, a limited array of host microbes must act on the prebiotic – not a large range with ill-defined, or no, health effects. There should also be an absence of undesirable side effects as used, such as excessive gas in the gut.
- When it has only been tested in the laboratory, and not in the target host.
- When it is not administered in sufficient amounts to confer a measurable benefit.

Many food ingredients are being touted as prebiotics when in reality they are not. Most of these have not been demonstrated to be selectively utilized or lack sufficient evidence of a health benefit.

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. See [here](#) for some additional information.

What foods have prebiotics? 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 to get a prebiotic effect. A more realistic method involves fortifying appropriate dietary ingredients 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.

[ISAPP Consensus Statement on the Definition and Scope of Prebiotics](#)
[Additional Resources](#)