

Prebiotic and Probiotic Foods

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SUMMARY

This rapid evolution has a significant impact on National public health institutes, social services, and health care systems. Consequently, elderly people are gaining increasing interest since they suffer immune system related health conditions that affect their quality of life. For this reason, new options for preserving their health have been investigated, with being functional food a potential option. “Let food be thy medicine and medicine be thy food”, the age old quote by Hippocrates is the ideology of today’s health conscious population. The concept of Functional foods emphasizes that food not only are vital for living but also play a role in the prevention and reduction of risk factors for several diseases and are also capable of enhancing certain vital physiological functions. Functional foods also provide the body with required amount of vitamins, fats, proteins and carbohydrates etc. Bacteria play invisible role to maintaining the human health. While we think of bacteria as invisible villains, your body is actually teeming with bacteria heroes. The gut bacteria (what scientists call gut microbiota) that live in your gastrointestinal tract are magical creatures. They help to break down and digest food.

INTRODUCTION

Probiotics are live microorganisms that, when administered in adequate amounts, award a health benefit to the host. There are different groups of probiotic microorganisms. As for prebiotics, the original definition was presented by Gibson and Roberfroid in the *Journal of Nutrition* in 1995 as a non digestible dietary ingredient that beneficially affects the host by selectively stimulating the growth or activity of a limited number of bacteria in the colon. That definition has been modified by many people, but it is a simple one. Fructo-oligosaccharides are a primary example of prebiotics, whereas non starch polysaccharides, plant wall polysaccharides, and pectin’s, among other carbohydrates, are not necessarily prebiotic agents, but most are classified as dietary fiber. Thus, all fiber is not prebiotic, and all prebiotics are not fiber, but what fiber and prebiotics have in common is that neither is digestible by human enzymes. Rather, they are fermented and digested by the microbiota of the intestine. The colonic micro flora is important to health. The growth and metabolism of the many individual bacterial species inhabiting the large bowel depend primarily on the substrates available to them, most of which come from the diet. This has led to attempts to modify the structure and metabolic activities of the community through diet using probiotics and prebiotics. Probiotics are live microbial food supplements. The best known are the lactic acid bacteria and bifidobacteria, which are widely used in yoghurts and other dairy products. These organisms are non-pathogenic and non-toxigenic, retain viability during storage, and survive passage through the stomach and small bowel. Prebiotics are non-digestible food ingredients which selectively stimulate the growth or activities, or both, of lactobacilli or bifidobacteria in the colon, thereby improving health.

Probiotics: Living strains of bacteria that add to the population of good bacteria in your digestive system.

Prebiotics: Specialized plant fiber that acts as food for the good bacteria.

What are prebiotics?

Prebiotics are substances found mostly in plant-based foods which provide sustenance for the beneficial bacteria in your gut. Prebiotic dietary fibers, resistant starches, and polyphenols (a type of phyto-nutrient) promote the growth and activity of health-promoting microbes. The body isn’t able to break down these substances, so it passes them on to the micro-biota, where your gut microbes turn them into useful metabolites like short-chain fatty acids (SCFAs) and vitamins.

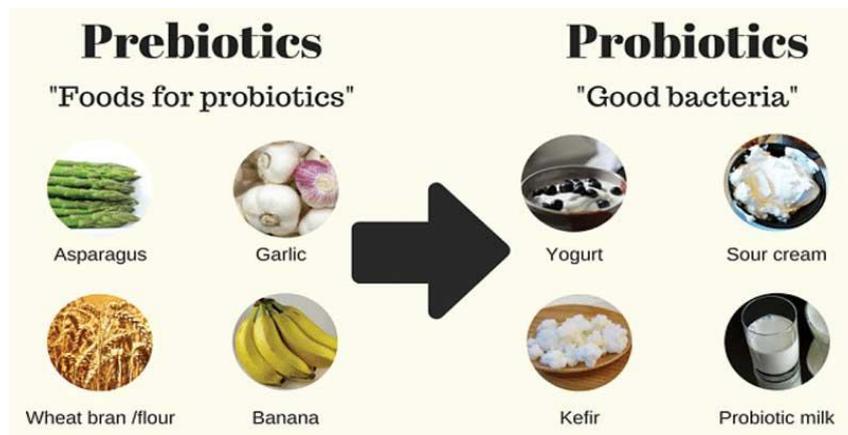
Prebiotic foods:

By including a variety of foods in their diet, people can ensure that they consume a range of prebiotics that may fuel various strains of bacteria. Prebiotics are in many high-fiber foods, including some fruits, vegetables, and whole grains. Some probiotic-rich foods may also contain prebiotics. Babies get access to prebiotics through the sugars in breast milk, and some infant formulas also contain prebiotics.

List of Prebiotic foods: Apples, Barley, Beetroot, Berries, Blackberries, Chicory, Mushrooms, Oats, Onions, Rye, Wheat, Citrus, Cold potato/pasta, Cranberries, Garlic, Jerusalem artichoke and Legumes

Benefits of Prebiotics:

Prebiotics nourish your gut microbiome, boost the growth of beneficial bacteria, and promote the production of health-promoting substances. Prebiotics encourage both the growth of health-promoting bacteria species, as well as enhance their activity. Indeed, the production of organic compounds by beneficial bacteria like short-chain fatty acids (butyrate, propionate, and acetate) is greatly supported by prebiotic foods. We people, probably already consume prebiotics without even realizing it because they naturally occur in plant foods, and milk too. The most stable sources of prebiotics are specific types of dietary fibre because they are less sensitive to heat and age, compared to say, polyphenols, which are plant nutrients that can be affected by cooking. However, just because many fibers are prebiotics doesn't mean that all fibre are prebiotic. Some insoluble fibers can't be broken down by gut microbes. That's okay because they give mass and bulk to your stools, like psyllium husk and hemi-cellulose. They help you to have regular bowel movements, thus preventing constipation and abdominal discomfort.



What are probiotics?

Probiotics are foods and supplements which contain a source of live bacteria that can have several actions on the human body. Probiotic bacteria, like *Lactobacillus* and *Bifidobacterium*, help maintain order in the gut microbiome by maintaining the right acidity and deterring opportunistic from colonizing your gut.

PROBIOTICS VS PREBIOTICS

Prebiotics are components of non-digestible high fiber foods that go undigested through the small intestine. They ferment in the colon to act as fuel for the "good guys" – Probiotics – the good bacteria and yeast essential for gut health.

Prebiotics Benefits:

- Help maintain gut health
- Help bring down antibiotic usage substantially
- Reduce chances of gestational diabetes
- Reduce the vaginal infections such as yeast infections
- Microbiome therapy (taking prebiotics and probiotics in combination) reduces postoperative complications

Probiotics Benefits:

- Modify the glycemc index
- Improve premature babies' gut health when added to infant formula
- Enhance colonic bacterial fermentation to improve metabolism & digestion
- Reduce the prevalence and duration of infectious & antibiotic-associated diarrhea
- Reduce the inflammation & symptoms associated with inflammatory bowel disease
- Exert protective effects to help prevent colon cancer
- Enhance the bioavailability & uptake of minerals like calcium, magnesium & iron
- Lower some risk factors for cardiovascular disease

Probiotic food:

List of Probiotics foods: There is an array of foods which are considered probiotic, especially fermented types, and there are plant-based foods too. Some examples are:

Dairy	Beverages	Pickles	Soy
Yoghurt	Water kefir	Sauerkraut	Miso
Milk kefir	Kombucha	Kimchi	Tempeh
Soft, raw cheeses	Tepache	Lacto-fermented pickles	Natto

Benefits of Probiotics:

Probiotics in fermented foods and supplements may benefit health by breaking down food and boosting the immune system. Fermentation is a process where bacteria transform a substance, and it’s what probiotic bacteria are renowned for; Probiotics can have positive health effects even if they just pass through the gastrointestinal tract but don’t settle down in the microbiome. Plant based probiotics (fermented soy), sauerkraut, kimchi, and lacto-fermented pickles are only possible thanks to the actions of bacteria like *Lactobacillus* and *Bifidobacterium* that metabolize sugars and increase the nutritional value of these foods. Fermentation is advantageous for humans because such foods provide a great way for the beneficial bacteria to enter the body. Historically, it was also essential because no one had a fridge or freezer back in the day, and now science is turning to these traditional foods to find solutions for health

Health benefits of probiotics:

Lots of research has been carried out about the benefits of probiotics on human health, and not just for gastrointestinal disturbances. In fact, the effects of probiotics are so vast that researchers are even studying how they contribute to mental health. If your doctor has ever prescribed probiotics alongside a course of antibiotics, it’s because antibiotics disrupt the microbiome and probiotics can help mitigate the negative effects. Probiotics introduce beneficial bacteria into the gut microbiome that can help restore balance and prevent unhelpful, opportunistic bacteria from becoming too abundant. Some research suggests that probiotics could have anti-cancer properties, especially against colon cancer. Studies have shown that certain strains of *Lactobacillus* and *Bifidobacteria* can stop the growth of bacteria which produce enzymes that convert pro-carcinogens to carcinogens. Another promising benefit of probiotics could be their ability to lower blood pressure. They have previously been shown to improve cholesterol levels, but studies have found that individuals with high blood pressure who were administered daily doses of probiotics for a period of over eight weeks had improved blood pressure. Probiotics have been demonstrated time and time again to be safe for use in healthy people. However, those who are immune-compromised, people whose immune system is already impaired, may experience side effects from probiotic administration.

The side effects may include:

- Gas
- Constipation
- Nausea
- Hiccups
- Rash
- Infections

CONCLUSION

It’s important to remember that both probiotics and prebiotics work together, synergistically. While you may load up on probiotic supplements, it won’t do your body much good if you continue to eat a diet devoid of

fresh fruits, vegetables and other foods rich in insulin, fructans and oligosaccharides. Similarly, a diet rich in prebiotics will give your intestinal flora something to feed on, but it's likely that your intestinal flora could use a boost if you've typically eaten a poor diet or been at antibiotics at some point.

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