

## Gut Microbiota: Probiotics, Prebiotics and Synbiotics

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### DESCRIPTION

Millions of bacteria are present in the gut of organisms. Health and wellbeing are significantly impacted by the gastrointestinal tract metabolic activity. Colonic bacteria are crucial for preserving health. Anaerobic bacteria make up the majority of the intestinal microbiota. Pathogens may proliferate as a result of disruptions to the normal intestinal microbial community in the digestive tract. The host's physiology, immunology, etc. are affected by the gut microbiota. The absence of gut microbiota causes reduced mucosal cell turnover and vascularity, reduced cytokine production and digestive enzyme activity. Usage of antibiotics leads to disturbances in the gut flora. Probiotics, prebiotics, and synbiotics can all help to increase gut flora.

### Probiotics

Probiotics are defined as live organisms when ingested/consumed in sufficient quantities results in health benefit to the host. Beyond fermentation, lactic acid bacteria are also referred to as probiotics which have a favorable impact on human health. This results in enhancing the composition of intestinal microbiota. *Lactobacillus*, *Bifidobacterium*, *Streptococcus*, *Lactococcus*, and *Saccharomyces* have been promoted in food products due to their high probiotic potential.

The advantages of probiotics include the following:

1. Restoration of a healthy intestinal microbiota
2. Improves disease prevention.
3. Reduction of serum cholesterol
4. Improves immune system response
5. Promotes better calcium absorption
6. Vitamin synthesis and protein predigestive enzymes
7. Lactose metabolism and a decrease in lactose intolerance

### Prebiotics

These are referred to as the non-digestible/low-digestible food components that help the host organism by promoting the activity of a single probiotic bacterium, or a small group of

bacteria in the colon. The most common prebiotics are oligosaccharides, which can be fermented. Lactulose, galactooligosaccharides, inulin and its hydrolysates, maltooligosaccharides, resistant starch, etc. are examples of prebiotics that are often utilized in human nutrition.

Prebiotics should neither be hydrolyzed nor absorbed in the upper part of the gastrointestinal tract. It needs to be selectively fermented by potentially beneficial bacteria in the colon. It should have a beneficial effect on the health of the host. Prebiotics acts as anti-hypertensives, anti-diabetics, also have immunomodulatory effect that reduces the risk of inflammatory and intestinal diseases. *Bifidobacterium* is a major intestinal organism targeted by prebiotics. The effects of bifidobacteria on humans are as follows:

1. Lowers blood cholesterol levels
2. Functions as an immunomodulatory agent
3. Produces vitamins
4. Restores normal gut flora
5. Inhibits the growth of potential pathogens
6. Lower blood ammonia levels

### Synbiotics

Synbiotics can be defined as a combination of probiotics and prebiotics that have a positive impact on the host by enhancing the survival and transplantation of live microbial food supplements in the gastrointestinal tract. In other words, live microbial supplements (probiotics) can be used in combination with specific substrates (prebiotics) for growth. For example, fructooligosaccharides associated with bifidobacteria or lactitol associated with *Lactobacillus*.

Synbiotics has several health benefits at the time of pediatric surgery. Viable preparations of *Bifidobacterium breve* strain *Yakult* and *Lactobacillus casei* strain *Shirota* were used and supplemented with galactooligosaccharides as probiotics. When synbiotic therapy improved the intestinal flora, intestinal peristalsis was restored, intestinal distension was reduced, and nutritional status was improved, as reflected in weight gain.

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