

# Probiotics and Gut Microbiome Health

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## Abstract:

Recent years have witnessed the global upsurge in the use of probiotics by people as they realized several health benefits. The health of the gut microbiome contributes to the well-being of the human body and the prevention of some diseases. Probiotics, prebiotics and other beneficial components taken in during a healthy diet help to balance the gut microbiome. The probiotics play a significant role both in the prevention and treatment of stomach and intestinal complaints, mental diseases, COVID-19, cancer, and anemia. Yoghurt is considered as a very good source of probiotics, and it should preferably be consumed in the morning. Probiotics manufactured by several pharmaceuticals, are easily available at the pharmacist's shop, and is usually considered safe when consumed in proper amount. It is found very useful in the patients who are having antibiotic associated diarrhea. Furthermore, it has several other properties including antimicrobial, anti-inflammatory, antioxidant, antiallergic, and immunomodulatory. The digestive discomfort has been noticed in a few people. Our manuscript provides an insight into the scientists' recommendations regarding probiotics. These recommendations include research, promotion and application of these beneficial bacteria in healthcare practice. In addition, we highlight the importance of food industry research towards further probiotic food developments, which can complement the treatment of many diseases in a natural way.

**Key words:** gut microbiome; healthy nutrition; health promotion; probiotics

## 1. Introduction

Probiotics are live microbes that have the potential to improve the gut microbiota. The balance of the gut microbiome contributes significantly to the health of the intestinal tract and the entire human body [1, 2]. The intestinal microbiome is the multitude of microorganisms living in the gastrointestinal tract, which live in symbiosis with each other. The microorganisms of the gut microbiome affect the health of the entire human body, the functioning of the immune system or the development of mental diseases [3, 4]. Disruption of the balance of the gut microbiome can lead to the development of many other diseases [4,1]. These diseases mainly affect the gastrointestinal system. Intestinal diseases can be accompanied by many complaints, such as diarrhea, significant weight loss, and fatigue. A healthy and regular diet helps balance the gut microbiome. Probiotics and prebiotics are found in many foods, especially in dairy products (yogurt, kefir), fermented vegetables and fruits, and fermented probiotics beverages, which also help to regenerate the intestinal microbiome [1]. Many dietary supplements containing prebiotics and probiotics are also effective in regenerating the gut microbiome. Very recently, Pal and co-workers [6] published a comprehensive review on recent advances in the health benefits and safety of probiotics. The main objective of this manuscript is to summarize the

properties of probiotics that contribute to the health of the gut microbiome.

## 2. Materials and methods

We searched on Google and other sites many manuscripts related with the probiotics and gut microbiome health. Out of these, we selected only 9 manuscripts to prepare our publication.

## 3. Results

Probiotics are living microorganisms (e.g. lactic acid bacteria (Lactobacillus) or Bifidobacterium) that have several health benefits. By consuming them, many diseases can be prevented [5, 6]. Probiotics can also be used as an adjunctive therapy. Their beneficial effects, such as antimicrobial, anti-inflammatory, antioxidant, immunomodulatory effects are also proven by numerous manuscripts, in addition to the benefits of prebiotics [5, 7, 8, 6]. Furthermore, probiotics help people who can not break down lactose, fight diarrheal diseases, treat ulcers, stimulate the immune systems, keep food fresh, treat anemia, treat and prevent obesity, maintain mental health, prevent inflammatory bowel diseases, prevention of antibiotic associated diarrhea besides lowering the risk of

development of colon cancer [6]. In addition, the probiotics have antiallergic effect, antipathogenic effect, and scientists also search the connection between COVID-19 and probiotics [6].

Foods enriched with probiotics also play a considerable role in healthy nutrition, e.g.: fermented products [9]. Many other active ingredients also contribute to the health of the intestinal microbiome, such as calcium, potassium, magnesium, sodium, phosphorus, and also, water- and fat-soluble vitamins, flavonoids or fiber. One can get these active ingredients into our body through a healthy diet. The consumption of these active ingredients also supports normal bowel function, digestion, and absorption. This contributes to healthy food intake, preventing the development of diseases related to nutrition or mental state. Regular consumption of drinking water is also beneficial for intestinal health.

Due to the benefits of probiotics, scientists recommend consuming and popularizing probiotic-rich foods (e.g. yogurts, fermented products), and dietary supplements. They also recommend the use of probiotics in the healthcare field in the treatment and prevention of a wide range of diseases. In addition, scientists and experts also recommend continuing food industry research on probiotics [6].

#### 4. Conclusion and recommendations

The health of the gut microbiome affects the well-being of human beings. A healthy diet and fluid consumption, especially the supplementary use of probiotics and prebiotics, contribute to maintaining the balance of the intestinal microbiome. By maintaining the balance of the intestinal microbiome, some diseases can be prevented and treated. The promotion of probiotics, prebiotics, and probiotic-containing foods is also a significant task today and many forms of it are known. It is advised to providing written and verbal information to healthy people and patients. Promoting fermented products and supplements containing probiotics on numerous social media platforms is recommended. The use of probiotics in healthcare and prevention must be encouraged. The person with weak immune system, or recently undergone surgery or suffering from critical illness should not take probiotics. Use of probiotics is advised in patients who are suffering from antibiotic associated diarrhea. Emphasis is given on enlightening the importance of food industry research, which professionals can use to contribute to probiotic product development.

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#### Contribution of authors

Both authors contributed during the preparation of the manuscript.

#### Conflict of interest

There was no conflict of interest.

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