

LACTIC ACID BACTERIA BENEFITS RESEARCH REPORT

Lactic acid bacteria (LAB) are widely recognized for their beneficial effects on human health, particularly in the areas of gastrointestinal wellness, immune function, and potential roles in preventing certain diseases. Here is an in-depth research report on the health benefits of LAB, highlighting recent findings and applications:

1. Overview of Lactic Acid Bacteria :

Definition and General Properties: LAB are a group of Gram-positive bacteria that primarily ferment carbohydrates into lactic acid. Common genera include *Lactobacillus*, *Lactococcus*, *Streptococcus*, and *Leuconostoc*.

Probiotic Characteristics: These bacteria are considered probiotics due to their ability to survive in the gut and confer health benefits to the host.

2. Gastrointestinal Health :

Enhancing Gut Flora: LAB can balance the gut microbiota, promoting the growth of beneficial bacteria while inhibiting harmful pathogens.

Improving Digestive Function: They help in digesting lactose and other complex carbohydrates, which can alleviate symptoms of lactose intolerance.

Reducing Gastrointestinal Disorders: Several studies have shown that LAB can mitigate symptoms of irritable bowel syndrome (IBS), reduce the risk of diarrhea, and help in the treatment of colitis. <https://pubmed.ncbi.nlm.nih.gov/21831747/>

Conclusion from the above research report :

Lactic acid bacteria (LAB) have become popular as probiotics, evolving from traditional dairy products to a significant market in health supplements and functional foods. Extensive research is being conducted to identify new probiotic strains and understand their health benefits and mechanisms. The FAO/WHO has recently established criteria for selecting probiotic strains, which are evaluated through in vitro and in vivo tests, along with mandatory safety studies due to rare instances of bacteremia. This review highlights the health benefits and safety of LAB probiotics, the selection criteria, their mode of action, and their influence on gut microbiota.

3. Immune System Support :

Modulation of Immune Response: LAB can enhance immune function by increasing the activity of macrophages and natural killer cells, and stimulating the production of antibodies.

Prevention of Infections: Regular consumption of LAB has been linked to reduced frequencies of respiratory and urinary tract infections. <https://pubmed.ncbi.nlm.nih.gov/11709854/>

Conclusion from the above research report :

Lactic acid bacteria (LAB) are naturally present in the intestines of most animals and have significant beneficial effects on the immune system. They are commonly found in foods and used as probiotics to enhance biological functions in the host. LAB activate the immune response through complex interactions within the intestinal ecosystem. Understanding the role of LAB in gut health and the mucosal immune system is crucial for selecting probiotic strains with immunostimulatory properties. Although LAB have shown potential in protecting against diseases like infections and cancer, further research is needed to optimize their use as oral vaccine vectors and therapeutic agents. This review will delve into the immunostimulatory capabilities of LAB and the criteria for selecting effective probiotic strains.

4. Potential Anticarcinogenic Effects :

Inhibiting Tumor Growth: Some strains of LAB have been shown to possess anticarcinogenic properties, possibly through the production of anti-mutagenic compounds that reduce the risk of tumor development.

Enhancing Detoxification: LAB may aid in detoxifying carcinogens present in the diet, thus potentially lowering cancer risk. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8548880/>

Conclusion from the above research report :

Lactic acid bacteria (LAB), Gram-positive bacteria that colonize the gastrointestinal tract, offer numerous probiotic benefits and have diverse applications across industries, agriculture, food safety, and medicine. Traditionally, research has focused on their roles in enhancing digestion, balancing gut microflora, and reducing toxic substances. Recently, interest in LAB's potential anti-cancer properties has increased. This paper summarizes the bio-active substances produced by LAB that exhibit anti-cancer effects and examines the safety of LAB in clinical cancer treatment. It also explores future research directions and the potential of LAB as a therapeutic option for cancer.

5. Metabolic and Cardiovascular Health :

- **Improving Metabolic Outcomes:** LAB supplementation has been associated with reduced cholesterol levels, improved blood glucose control, and a decreased risk of type 2 diabetes.

- **Blood Pressure Regulation:** Certain LAB strains can produce bioactive peptides that help lower blood pressure. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9530890/>

Conclusion from the above research report :

Fermented foods have been part of human diets for over 10,000 years and are gaining renewed popularity for their potential benefits on cardiometabolic health. However, the evidence supporting these benefits remains unclear, partly due to misclassification of fermented foods and reliance on subjective dietary assessments in studies. Future research should focus on

improving dietary assessment methods for fermented foods, understanding the composition of various fermented products, and exploring their role in healthy, sustainable diets. This will help clarify the relationships between fermented foods and cardiometabolic health.

6. Allergies and Skin Health :

- Reducing Allergy Symptoms: LAB can modulate immune responses related to allergies, such as atopic dermatitis in children.
- Skin Health: Probiotic LAB may improve skin conditions by enhancing the skin's barrier function and reducing inflammatory responses.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4439985/>

Conclusion from the above research report :

The effectiveness and safety of long-term probiotic supplementation vary significantly based on the species and strains of lactic acid bacteria (LAB). Confirming these factors requires rigorous in vitro studies, animal testing, and randomized, double-blind placebo-controlled clinical trials. LAB show variable effects in preventing and treating allergic diseases due to differences in their mechanisms of action. Factors such as the number and viability of microorganisms in the gut, their retention time, and existing gut microflora composition influence the immune response induced by probiotics.

Probiotics, whether taken as pharmaceutical preparations or through fermented foods, are effective in preventing allergies and, to a lesser extent, in alleviating existing allergy symptoms. Their principal benefits include proven effectiveness, safety (even for children and infants), and lack of side effects. As allergies become increasingly common, further research is essential to explore the health-promoting effects of probiotic strains and their potential in preventing and treating various diseases, including allergies.

Conclusion:

Lactic acid bacteria offer a range of health benefits that extend far beyond traditional uses in food fermentation. Their role in promoting gastrointestinal health, enhancing immune function, and potentially reducing the risk of certain diseases underscores their importance in both dietary and therapeutic applications. Ongoing research continues to uncover the vast potential of these microorganisms in improving human health.

**The information displayed herein has not been evaluated and/or approved in any form by the Japan Ministry of Health, FDA and/or similar body in Japan or elsewhere.*