

# A Review Study on Importance of Probiotics Yogurt for Human Health Improvement

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**ABSTRACT:** *Yogurt is one of the most widely consumed fermented dairy products in the world, with high consumer acceptance due to its health benefits beyond basic nutrition. Yogurt, in general, contains milk proteins with a higher biological value and almost all of the essential amino acids required for good health. In order to meet the government's targets set out in the Millennium Development Goals theme, undernutrition must be addressed immediately and effectively with the goal of reaching a larger segment of society, primarily low-income people who cannot afford food with nutritional value to some extent. Yogurt is a probiotic carrier food that can deliver large amounts of probiotic bacteria into the body, providing specific health benefits once consumed. Yogurt is also said to help with lactose tolerance, immune enhancement, metabolic disorders, and gastrointestinal disorders prevention. Consumer demand for yogurt has increased as a result of these well-known health benefits, and it has become the fastest-growing dairy category in the world. Yogurts are now available in a wide range of styles and varieties, with varying fat contents, flavors, and textures to suit various meal occasions.*

**KEYWORDS:** *Gastrointestinal Disorders, Human Health, Metabolic Disorder, Probiotics, Yoghurt.*

## 1. INTRODUCTION

In this context, the development of ready-to-use therapeutic foods (RUTFs) has ushered in a revolution in the treatment of severe acute malnutrition while also catalyzing the development of other food-based commodities to treat and prevent less severe and other forms of malnutrition. For thousands of years, indigenous fermented foods have been made and eaten, and they are deeply rooted in culture and custom. Bifidobacterium, Lactobacillus, and Streptococcus bacteria, as well as yeasts such Saccharomyces boulardii, are the organisms that have been researched the most and are usually considered probiotics. People in the modern world are becoming more health conscious, and as a result, they are making dietary and lifestyle changes. Supplementing with probiotics and probiotic-based products is one of the dietary changes[1], [2].

The importance of probiotics has been reported by several researchers, who claim that it promotes proper digestion, improves the immune system, treats diarrhea caused by antibiotics or travel, prevents ulceration caused by helicobacter pylori, and aids in nutrient assimilation, especially B vitamins and omega-3 fatty acids. These health benefits sparked the research, which aimed to prove that ingesting these microorganisms has clinical health benefits. It is a major focus of attention for scientists all over the world because of the promising health benefits it provides, and its applications provide an innovative approach to developing novel probiotic formulations[1], [3]–[5].

The article examines the available reports on probiotics and describes how probiotics function in human ecosystems. Probiotics have the potential to treat a variety of diseases, including gastrointestinal issues, lactose intolerance, acute diarrhea treatment, cancer, diabetes, and allergy-related problems. Yogurt, second Yogurt is a bacterial fermented food product made from Lactobacillus delbrueckii subspecies bulgaricus and Streptococcus salivarius subspecies thermophilus working together. "Yogurt cultures" was the name given to these Lactic acid bacteria. Yogurt starter cultures, which are used in the production of yoghurt, ferment lactose (milk sugar) and generate lactic acid in the milk, causing the milk to coagulate or form a soft gel. During the fermentation of milk, flavor molecules are also generated. Yogurt is produced using a unique starting culture that contains a symbiotic mix of two main bacteria, S. thermophilus and L. bulgaricus, in a 1:1 ratio. L. bulgaricus produces acid, whereas S. thermophilus produces fragrance components. When they develop together, the rate of acid generation is considerably greater than when they grow apart. S. thermophilus grows more quickly and generates both acid and carbon dioxide, which encourages L. bulgaricus to thrive. L. bulgaricus' proteolytic activity generates stimulatory peptides and amino acids, which S. thermophilus uses. In general, each gram of freshly made yogurt includes 10<sup>9</sup> cells[6]–[8].

Lactic acid is generated by these bacteria, which reacts with milk protein to give yogurt its texture and tang. Yogurt is a nutritious fermented food for humans because of its excellent digestion and bioavailability of protein, energy, calcium, and other micro and macronutrients. For yoghurt preparation, different types of milk are used, such as whole milk for full fat yogurt (3.35% milk fat), low fat milk for low fat yogurt (2% milk fat), and skim milk for nonfat yogurt (0.55% milk fat). The composition of yoghurt is adjusted by using other dairy ingredients such as cream and nonfat dry milk. To enhance the body and texture of yogurt, stabilizers

(alginate, gelatin, gums, pectins, and starch) may be added. Stabilizers assist keep the fruit evenly blended in the yogurt by avoiding whey separation (syneresis)[9]–[12].

### *1.1. Probiotics:*

Probiotics are often taken as nutritional supplements or as part of fermented foods with specifically added active living cultures, such as yogurt and soy yogurt. Probiotics have become an important part of the modern world as food, nutritional supplements, biologics, and medicines due to their ability to provide health advantages. These may be used as dietary supplements or as a preventative or curative medication since they contain live nonpathogenic bacteria. These probiotics' health-promoting effects are mostly due to the bacteria and metabolites that they generate. Probiotics are present in the intestinal microbiota as a transitory component with inadequate concentrations, but when given in appropriate quantities, they provide a health benefit to the host and may help prevent or treat certain illnesses to some degree.

In recent years, Indian consumers have become more conscious of the significance of nutrition, health, and the quality of the food they consume. Instead of physical activity, consumers choose a nutritious diet. They are turning to health supplements, which may have negative consequences. Increased sales of health goods among health-conscious customers across the world demonstrated consumer interest in these items, resulting in the creation of new health food categories. Probiotics are still in their infancy, and their use as a dietary supplement is confined to metropolitan regions. The usage of probiotics on a regular basis may enhance one's quality of life while also lowering medication dependency and medical costs. Probiotics are thought to have a twofold impact, either preventing/decreasing pathogen microbe colonization in the gut or interacting with the gut associated lymphoid tissue (GALT) to avoid inflammatory reactions and increase tolerance to themselves and potentially meals.

The immune system is strengthened, skin function is improved, DNA is protected from oxidative damage, proteins and lipids are protected from oxidative damage, and individual gut flora is maintained in patients undergoing antibiotic therapy. Lactobacillus, Bifidobacterium, and Enterococcus strains are among the most promising probiotic strains. Probiotic cultures may be found in fermented dairy products and fortified meals, as well as pills, capsules, powders, and sachets containing the bacteria in freeze-dried form. Various probiotic strains have been found to be effective in urogenital infections, gut infections, and mouth infections. Probiotics have been shown in trials to aid in the healing of stomach ulcers.

### *1.2. Metabolism:*

Metabolism refers to a complex collection of chemical processes that occur in the body to convert or utilize energy. Food is broken down into its simpler components, mostly proteins, carbohydrates, and fats, excess nitrogen is transformed into waste products, and chemicals are broken down or converted into other substances and made accessible for cells, and so on. When aberrant chemical reactions in your body disturb this process, you have a metabolic disease. When this occurs, the body may have an excess of certain chemicals or a deficiency of others that it need to remain healthy. Diabetes is an example of a metabolic illness that occurs when certain organs, such as the pancreas or liver, become damaged or cease to operate properly. The National Institutes of Health has documented hundreds of cases of a hereditary metabolic disease caused by single gene mutations. These mutations may be passed down through family generations.

### *1.3. Diabetes Type 1:*

Diabetes mellitus is a set of carbohydrate metabolism diseases defined by high blood glucose levels (hyperglycemia) and generally caused by inadequate insulin synthesis (type 1 diabetes) or an inefficient insulin response in cells (type 2 diabetes; T2D). Insulin, which is needed to transfer blood glucose (sugar) into cells, is produced by the pancreas. Weight loss, polydipsia, polyuria, and sometimes polyphagia and impaired eyesight are all symptoms of severe hyperglycemia. Chronic hyperglycemia may also lead to an increased risk of infection and development impairment. Hyperglycemia with ketoacidosis or the nonketotic hyperosmolar syndrome is a life-threatening complication of untreated diabetes.

Diabetes may cause nephropathy, which can lead to blindness and visual loss, renal failure, amputations, peripheral neuropathy, which can lead to foot ulcers and Charcot joints, and autonomic neuropathy, which can cause gastrointestinal, cardiovascular, genitourinary, and sexual dysfunction. Diabetes patients are more likely to develop peripheral artery disease, atherosclerotic cardiovascular disease, and cerebrovascular disease. In individuals with diabetes, abnormalities in lipoprotein metabolism and hypertension are common. The link between dairy products and type 2 diabetes. They discovered that eating a 28.0 g. portion of yogurt

per day was linked to an 18% reduced incidence of T2D. According to research, magnesium, calcium, or certain fatty acids found in dairy products may help to reduce the incidence of T2D.

Probiotic bacteria present in yogurt has been proven in studies to enhance lipid profiles and antioxidant status in individuals with type 2 diabetes. According to Frank Hu of Harvard School of Public Health, greater yogurt consumption is linked to a lower incidence of T2D, while other dairy items and overall dairy consumption did not demonstrate this link. Yogurt's consistent results suggest that it may be included in a healthy eating pattern. Over time, blood sugar levels that are either too high or too low may cause severe damage to the body. Hyperglycemia, often known as high blood sugar, is a condition in which the blood plasma contains an excessive quantity of glucose. One of the basic signs of diabetes mellitus is hyperglycemia, which is accompanied by frequent and excessive thirst as well as frequent and excessive urine.

#### *1.4.Obesity:*

Obesity has become a major public health issue that has spread to epidemic proportions across the globe, not just in developed but also in emerging nations. At least 2.6 million people are more likely to have a heart attack or die from obesity-related diseases each year as a consequence of obesity or overweight. The microbiota structure is influenced by the food that people usually eat, and therefore the involvement of bacteria in energy balance, along with dietary variables and genotype, all seem to contribute to increased adiposity and the development of obesity. According to a study performed by the University of Tennessee in Knoxville, eating curd on a daily basis helps to burn belly fat.

The hormone cortisol is found in the waist, and it provides a signal to the body to store more fat in the belly area. Yogurt has a sufficient quantity of calcium, which tells cortisol to release less fat cells. The presence of amino acids aids fat burning as well. Greek yogurt is more helpful in weight loss management in this instance since it includes a greater proportion of calcium than regular yogurt. Greek yogurt has twice as much protein, half as much salt, and half as much carbohydrate as regular yogurt. Greek yogurt is a popular product among athletes and elderly citizens due to its high protein content. The reduced salt content is especially beneficial to those with high blood pressure. Hyperlipidemia is a condition in which the body produces excessive amounts of lipids.

Diabetic patients' plasma lipid and lipoprotein profiles have been shown to change. According to several studies in the literature, insulin resistance plays a key role in the development of dyslipidemia in diabetic individuals. Free fatty acids flow from adipose tissue to the liver in insulin resistance, increasing the production of very low density lipoprotein cholesterol and low density lipoprotein cholesterol (LDL-c) while decreasing the levels of high density lipoprotein cholesterol (HDL-c). Furthermore, hyperglycemia caused an increase in the density of advanced glycation end products in insulin resistance patients. By altering the activity of macrophages, endothelial cells, and smooth muscle cells, these compounds may directly cause atherosclerosis. As a result, improving dyslipidemia may help diabetic individuals avoid problems.

Overproduction of reactive oxygen species and a decrease in the body's antioxidant defense function are the mechanisms through which oxidative stress causes diabetes complications and tissue damage. One of the major biological targets of oxidative stress is lipid peroxidation, which leads to the production of secondary products such as malondialdehyde, which exacerbates oxidative damage. In recent years, MDA has been shown to rise substantially in pathological situations, making it a frequent oxidative stress indicator. After eating probiotic yogurt, discovered a substantial decrease in blood glucose and MDA levels in type 2 diabetes individuals. looked examined the antioxidative effects of probiotics in healthy people and discovered that after taking probiotics, blood total antioxidant activity (TAA) and total antioxidant status (TAS) improved significantly. Also found that diabetic rats treated with *L. acidophilus* had significantly lower MDA levels.

#### *1.5.Diabetic foot ulcer:*

With the rising incidence of diabetes, diabetic foot ulcers (DFU) are becoming more common. DFU affects around 15% of all diabetes individuals and is the leading cause of nontraumatic amputation globally. Chronic diseases such as diabetic foot ulcer (DFU) are difficult to treat because of increased susceptibility to infection and delayed wound healing [31]. Because of the complexity of current treatment, as well as its side effects and microbial resistance, an alternate strategy to DFU management is required. The growing amount of data supporting probiotic usage in a variety of disease states justifies its use in wound healing and infection as well [32]. Modulation of local and systemic immunity is the underlying mechanism of probiotics' therapeutic benefits. The theory is founded on the idea that probiotics' anti-infective and ulcer-healing mechanisms are the same in peripheral wound ulcers as they are everywhere in the body.

### 1.6. Blood pressure:

Long-term yogurt eaters were less likely to acquire high blood pressure and had lower systolic blood pressure on average than individuals who didn't consume yogurt, according to a research. The highest figure in a blood pressure measurement is the systolic blood pressure. When your heart beats, it measures the force of blood against the walls of your arteries. High blood pressure is a risk factor for stroke and heart disease, and it's also known as the "silent killer" since it usually goes unnoticed.

## 2. DISCUSSION

Yogurt is one of the most popular fermented dairy products, and its nutritional and health advantages have been well recognized for decades. Lactic acid-producing bacteria, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, ferment milk (whole, reduced-fat, low-fat), and additional bacteria, such as *Acidophilus* and other strains of the bacteria, may be added to the culture. Yogurt is a nutritious food because of its excellent digestion and nutrient absorption. People with metabolic problems, lactose intolerance, gastrointestinal diseases such as inflammatory bowel disease and irritable bowel disease may benefit from this fermented drink, which also helps with immunological function and weight management. The significance of probiotics has been recognized throughout cultures and strata of society for millennia in the form of the habit of eating preserved foods produced via the fermentation process. Traditional fermentation methods have been used for centuries to transform locally accessible materials, which may be of plant or animal origin, into edible products via the physiological activities of microorganisms. Traditional fermented foods include dairy products such as yoghurt, dahi, kefir, cheese (after lengthy storage), fermented vegetables or vegetable juices, as well as non-fermented fruit and berry juices.

## 3. CONCLUSION

Because of globalization and increased health awareness, the probiotic industry is growing at a fast rate. As a result of this realization, the dairy industry has shifted its focus from conventional milk products to more helpful functional milk products like probiotics and yogurt. Consumers should be aware that too much of anything is not necessarily a good thing, even if probiotics have proven to be effective in treating a variety of illnesses and diseases. A great deal of study has been done in this area over the last several decades, but no solid conclusions have been reached to yet, and we will have to wait even longer while research continues in this area. Consumers should grasp the idea of "probiotic rather than medication" till then. Aside from that, given the current scenario, there are great development possibilities for both local and international businesses to invest in the probiotic sector and leave a mark for the benefit of society.

### REFERENCES:

- [1] A. Yadav *et al.*, "Concise Review: Importance of Probiotics Yogurt for Human Health Improvement," *IOSR J. Environ. Sci. Ver. II*, 2015.
- [2] M. P. Doyle, L. R. Steenson, and J. Meng, "Bacteria in food and beverage production," in *The Prokaryotes: Applied Bacteriology and Biotechnology*, 2013.
- [3] A. Lourens-Hattingh and B. C. Viljoen, "Yogurt as probiotic carrier food," *International Dairy Journal*. 2001, doi: 10.1016/S0958-6946(01)00036-X.
- [4] C. Gómez-Gallego, M. Gueimonde, and S. Salminen, "The role of yogurt in food-based dietary guidelines," *Nutr. Rev.*, 2018, doi: 10.1093/nutrit/nuy059.
- [5] J. E. Bisanz *et al.*, "Randomized Open-Label pilot study of the influence of probiotics and the gut microbiome on toxic metal levels in Tanzanian pregnant women and school children," *MBio*, 2014, doi: 10.1128/mBio.01580-14.
- [6] G. Quijano, "The Benefits of Probiotics on Human Health," *J. Microb. Biochem. Technol.*, 2011, doi: 10.4172/1948-5948.s1-003.
- [7] D. Mozaffarian, "Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity," *Circulation*. 2016, doi: 10.1161/CIRCULATIONAHA.115.018585.
- [8] X. Yin, M. R. Salemi, B. S. Phinney, V. Gotcheva, A. Angelov, and M. L. Marco, "Proteomes of *Lactobacillus delbrueckii* subsp. *bulgaricus* LBB.B5 Incubated in Milk at Optimal and Low Temperatures," *mSystems*, 2017, doi: 10.1128/msystems.00027-17.
- [9] L. Ruiz, M. Gueimonde, P. Ruas-Madiedo, A. Margolles, and B. Sánchez, "Improving probiotics for functional foods," in *Advances in Food Biotechnology*, 2015.
- [10] G. Perdígón, M. Locascio, M. Medici, A. P. De Ruiz Holgado, and G. Oliver, "Interaction of bifidobacteria with the gut and their influence in the immune function," *Biocell*, 2003, doi: 10.32604/biocell.2003.27.001.
- [11] A. Talwalkar and K. Kailasapathy, "Role of Oxygen in the viability of probiotic bacteria," *Curr. Issues Intest. Microbiol.*, 2004.
- [12] S. Cavalu, J. Prokisch, V. Laslo, and S. Vicas, "Preparation, structural characterisation and release study of novel hybrid microspheres entrapping nanoselenium, produced by green synthesis," *IET Nanobiotechnology*, 2017, doi: 10.1049/iet-nbt.2016.0107.