Proceedings of the 2nd International Conference on Biological Engineering and Medical Science (ICBioMed 2022), Part I
DOI: 10.54254/2753-8818/3/20220477

The Value of Yogurt and Its Function in Health Care

Suqian Yao

North Cross School Shanghai, Shanghai, 200072, China

suqian.yao@splhs.org

Abstract. Yogurt is a dairy product that is high in nutritional content. Yogurt is high in protein, calcium, vitamins, and probiotics, making it beneficial **to** the human body. Consuming Lactobacillus-containing yogurt can help to enhance the intestinal environment and preserve intestinal flora equilibrium. Yogurt contains micronutrients that can boost the human body's innate immune system and reverse immunological weakness. Yogurt contains lactic acid, which can help to eliminate dangerous germs and improve digestion. Yogurt's phytosterols can help decrease blood cholesterol levels. Drinking yogurt can also help lactose-intolerant patients avoid the symptoms of lactose intolerance. Yogurt is a potential cancer treatment because it inhibits carcinogens and decreases inflammation. Patients suffering from diarrhea can minimize the frequency and duration of their symptoms by consuming yogurt. Yogurt can also help with chronic intestinal constipation in youngsters and constipation in pregnant women, especially when combined with bifidobacterium longum. The improved serum levels of total cholesterol and LDL cholesterol after consuming probiotic-containing yogurt suggest that the yogurt could be used to treat nonalcoholic fatty liver disease. The nutritional value and health benefits of yogurt were summarized in this article.

Keywords: yogurt, metabolism, gut microbiota, immunity

1. Introduction

Yogurt is a dairy product that has a high concentration of active lactic acid bacteria and is manufactured by fermenting Lactobacillus bulgaricus and Streptococcus thermophilus with cow milk or other milk as the major raw material. The nutritional content, health advantages, flavor, texture, and taste of yogurt are all affected by the strains of yogurt starter cultures used. The most prevalent fermentation strains in medical yogurt are Lactobacillus acidophilus and Bifidobacterium. Milk was fermented by lactic acid bacteria, which increased its nutritional value. In general, milk and yogurt have comparable vitamin and mineral contents. However, in order to make folic acid, vitamins B12 and C are consumed during the fermentation process. Calcium from yogurt is easier for the body to absorb and utilize than calcium from milk. Yogurt has less lactose than milk, but more lactic acid, galactose, peptide, free amino acid, and free fatty acid. As a result, it is used in medical defense, illness prevention, and therapy [1, 2].

2. The nutritional value of yogurt

Protein, calcium, vitamins, and probiotics are all plentiful in yogurt, all of which help to balance gut bacteria and prevent stomach problems. The enzyme produced by lactic acid bacteria will moderately breakdown the yogurt, generating amino acids, fatty acids, peptides, and other small molecules that are readily digested and absorbed by the human body. Yogurt may also manufacture a number of vitamins

© 2026 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-8818/3/20220477

required in the fermentation process in addition to preserving all of the nutrients found in fresh milk, including VB1, VB2, VB6, VB12, and others. Yogurt is also a good source of calcium. In general, 1 cup of 150g yogurt can offer 1/3 of the calcium needed by children under the age of 10, and 1/5 of the calcium needed by adults [3]. Yogurt is also an excellent source of minerals. There are 183 mg of Ca, 17 mg of Mg, 234 mg of K, 144 mg of P, and 0.9 mg of Zn in 100g of plain low-fat yogurt. Yogurt has nearly five times as many of these nutrients as milk. Furthermore, because calcium and magnesium remain ionic in acidic settings, fermentation of yogurt with lactic acid bacteria can increase their bioavailability in acidic conditions, allowing them to be absorbed by the body in the stomach more effectively [4].

3. The nutrition and health care function of yogurt

3.1. Keep the gut microbiota in balance

Lactic acid bacteria and bacterial components in yogurt provide an ideal habitat for the growth of beneficial lactic acid bacteria and Bifidobacterium, which can increase the overall number of intestinal probiotics and bacteria while lowering the amount of other bacteria [1]. More than a century ago, Elie Metchnikoff postulated that changing the gut microbiota with bacteria found in yogurt may improve health. In one study, it was discovered that eating Lactobacillus yogurt (6×10^7 - 2.4×10^8/g yogurt) had a substantial effect on alterations in gut flora. In the gastrointestinal system, yogurt can deliver a substantial quantity of lactic acid bacteria. By strengthening the bonds between intestinal epithelium and reducing host bacteria's production of potentially toxic enzymes, these lactic acid bacteria can improve the gut ecology [5]. According to research, consuming lactobacillus and Bifidobacterium-containing yogurt increased the amount of lactobacillus and Bifidobacterium in feces while decreased the amount of Enterobacterium, Enterococcus, and Staphylococcus [6]. Researchers discovered that reducing the intake of fermented foods for two weeks lowered white blood cell phagocytic activity, as well as the overall amount of lactic acid bacteria, aerobic bacteria, and SCFA concentrations in the participants' feces. It also has immune-stimulating characteristics since yogurt can change the gut microbiome [2].

3.2. Enhance the body's immunity

Yogurt boosts the immune system, lessening the likelihood of getting the disease. Yogurt contains zinc, vitamin B6, protein, and microorganisms, all of which may help boost immunity. According to some research, a shortage of these vitamins might impair the immune system. The administration of probiotics improves innate immunity, reduces the duration and severity of respiratory infections, and improves gut-related immunity [4]. Finally, the researchers observed that avoiding fermented foods may result in a decreased innate immune response, compromising the ability to respond to infection. Furthermore, lactic acid bacteria can enhance a weakened immune system. The bulk of studies have revealed the possible therapeutic advantages of yogurt and lactic acid bacteria.

3.3. Adjusting intestinal function

Lactic acid in yogurt enhances intestinal peristalsis and digestive juice flow. This increases the digesting capacity of the digestive tract, alleviating constipation. Furthermore, because yogurt can manage the amount of intestinal bacteria, it may not only reduce dangerous bacteria and spoilage bacteria in the intestine, but it can also diminish aberrant fermentation and microbial degradation of food in the intestine, decreasing intestinal gas production. As a consequence, yogurt can aid in the prevention of bacillary dysentery and the reduction of intestinal gas production [1]. Consuming fermented dairy products with Bifidobacterium lactobacillus DN-173010 ($\geq 10^8$ CFU/g) improves constipated women's bowel movement frequency and consistency, reduces initial long GI transport time (GTT) in healthy women, men, and the elderly, and enhances overall GI health and digestive problems in healthy females. The gut transit time was shortened in healthy Japanese women who regularly drank 170 g of yogurt with 10^8 CFU/g from same probiotics [7].

DOI: 10.54254/2753-8818/3/20220477

3.4. Cholesterol-lowering and lose fat

Because milk contains anti-cholesterol components, lactose, and calcium, eating yogurt on a daily basis can significantly decrease blood cholesterol levels. Several yogurts include hydroxymethylglutaric acid, an anti-cholesterol substance [8]. Dietary calcium, especially calcium from dairy products, can help with weight loss and fat loss, according to evidence from randomized controlled studies of overweight and obese people. The yogurt group consumed three 6-ounce portions of yogurt each day for a 12-week evaluation of a calorie and energy restricted dietary intervention. The yogurt group lost much more weight than the calorie-restricted and 0–1 serve daily replacement dairy groups, although having less calories than the control group. Similar to this, more abdominal fat decreased in the yogurt group than in the control group. Circulating glycerol significantly increased in the yogurt group, indicating greater lipolysis and a smaller waist circumference [9]. Researchers used soy milk and capsules with LactoBacil Plus (SCLBP) probiotic bacteria and fructose-oligosaccharides to make symbiotic soy yogurt, which was fed to hypercholesterolemic mice. Yogurt has been proven to reduce lipid peroxidation in the liver, triglycerides, LDL cholesterol, and blood cholesterol. Phytosterol esters are found in several low-fat yogurts. In a study of young Korean adults, phytosterol esters discovered in low-fat yogurt were useful in decreasing total cholesterol, LDL cholesterol, and oxidized LDL cholesterol levels in an unrestricted fat and cholesterol diet. Foods that contain plant sterols or sterols may be helpful in avoiding more serious hypercholesterolemia and cardiovascular disease in those with normal cholesterol levels or moderate hypercholesterolemia.

3.5. Prevent lactose intolerance

Bacteria harboring β-D-galactosidase may help in the breakdown of excess intestinal lactose, avoiding the typical symptoms of lactose intolerance. Lactose is degraded by bacteria that produce β-galactosidase, which lowers the pH of yogurt. Bacterial breakdown of lactose continues in the small intestine. Bacterial lactase is resistant to stomach acid because it is physically protected by bacterial cells and is supported by yogurt's buffering ability. Because of the rise in pH when yogurt enters the small intestine, along with the delayed gastrointestinal transit time, the bacterial lactase enzyme becomes active and fully digests the lactose in yogurt, avoiding symptoms in lactose intolerant people. Because yogurt contains Streptococcus thermophilus and Lactobacillus bulgaricus (108 bacteria/mL), their lactase capacities vary slightly. Lactose intolerant people create hydrogen gas when undigested lactose reaches the colon and gut microorganisms for fermentation. In one study, researchers gave 10 lactose intolerant people several test drinks containing the same amount of lactose. The quantity of hydrogen released by yogurt is just one-third of that emitted by the same volume of milk or water [10].

4. The therapeutic effect of yogurt on diseases

4.1. The treatment of cancer

Yogurt has the ability to inhibit tumor development by altering immune responses and triggering apoptosis. To prevent colon cancer, BALB/c mice were fed yogurt before and after being given the carcinogen 1,2 dimethylhydrazine (DMH). Six experimental groups were formed: 1) non-treatment control group; 2) DMH control; 3) DMH-yogurt: Use yogurt before and after DMH. 4) Yogurt-DMH: yogurt ingested within 10 days after DMH; 5) DMH-yogurt: yogurt consumed after DMH. Following the experiment, there were no malignancies in the DMH-yogurt group. Only tumor delay was observed in the yogurt-DMH group. TNF-α, INF-γ, and IL-10 levels were all increased across the board. These findings are consistent with earlier DMH control and yogurt-DMH-yogurt findings. Only in the first few months did IL-4 and apoptotic cells increase in the yoghurt-DMH group. Cell apoptosis increased in the DMH group during the therapy. Yogurt can boost TNFα and INF-γ levels in large intestine nodular cells. When yogurt was consumed for 10 days prior to receiving DMH injections, histological analyses of the large intestine indicated that this only served to postpone the development of tumors; hence, yogurt treatment prior to DMH injections was insufficient to suppress tumor start, as shown in Figure 1A. As shown in Figure 1B, mice fed yogurt following tumor formation showed

DOI: 10.54254/2753-8818/3/20220477

improvement in the large intestine when the yogurt was reintroduced cyclically to their diet, demonstrating that yogurt feeding can limit tumor development and progression [11].

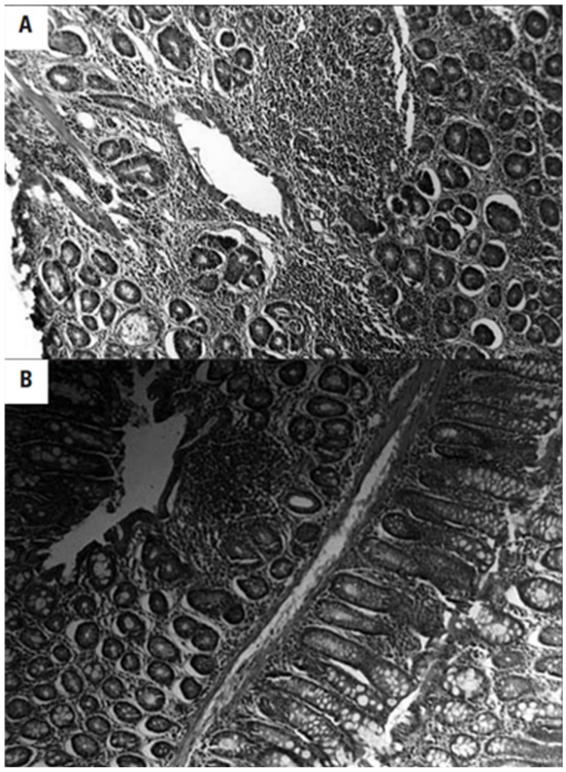


Figure 1. Hematoxilin-eosin-stained sections of mice large intestine stained after consuming yogurt before and after tumor formation. A) Yogurt-DMH group (100×) four months after starting DMH injection. Throughout the glands, inflammatory infiltrates proliferate, crypt abscesses develop, and structural normality is lost. (B) DMH-yogurt group after therapy (month 7). Mucin was plentiful and the lamina propria cells in goblet cells increased. The tissue was identical to that of the untreated control

Lyophilized extract of Myrciaria jaboticaba (LJE), albeit toxicologically unharmful, showed more damaging to cancer cells than to healthy cells. According to one research, as showed in Figure 2, different doses of LJE added into yogurt enhanced total phenolic content, antioxidant activity, and enzyme inhibition in a dose-dependent manner. The yogurt was then fed to rats with colon cancer, where it altered gut bacterial ecology, resulting in a prebiotic effect.

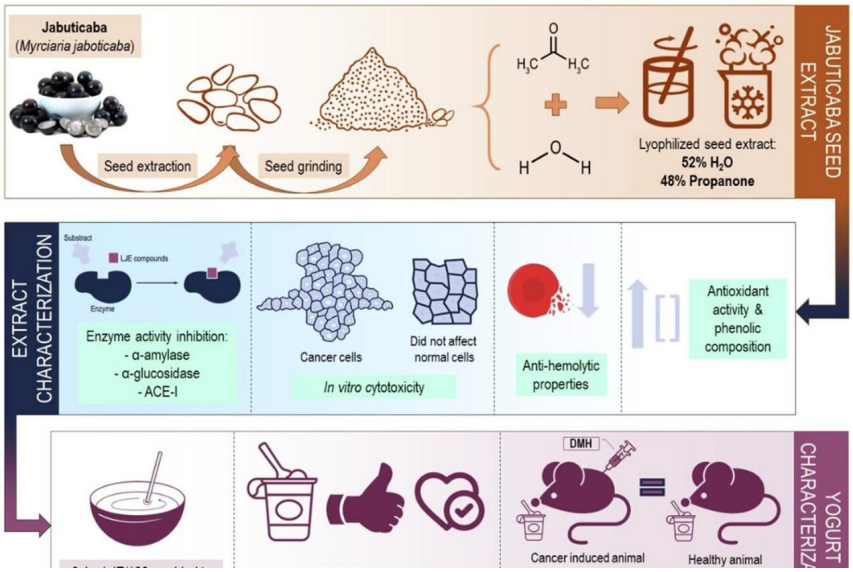


Figure 2. The procedure of the experiment in which polyphenols from jabuticaba seeds were integrated in a yogurt model to regulate the intestinal flora of rats with colon cancer caused by 1,2-dimethylhydrazine.

DOI: 10.54254/2753-8818/3/20220477

In a massive study of 1.44 million people, researchers showed that yogurt and dietary fiber both might reduce the risk of lung cancer on their own or in combination. They observed that, after adjusting for smoking status, smoking history, and other lung cancer risk variables, yogurt and fiber intake had a negative relationship with the chance of developing lung cancer [12].

4.2. Treatment of diarrhea

Probiotics can significantly minimize the duration of persistent hematochezia in diarrhea patients. According to one study published in the Iranian Clinical Trial Center Registry, the duration of blood in feces during diarrhea was 2.62 days for probiotic users and 3.16 days for controls. In addition, hospital stays for probiotic users were on average 3.16 days shorter than for the control group (3.66 days). Probiotics, it may be argued, can effectively shorten the length of dysentery and diarrhea. Yogurt with probiotics is more effective than ordinary yogurt in curing diarrhea [13]. In a study evaluating the frequency and duration of acute watery diarrhea in children aged 1 to 5 years, the probiotic yogurt group experienced the first discernible drop in frequency of diarrhea after admission after 2. 65±0.72 days, while the conventional yogurt group experienced this drop after 2. 15±0.61 days [14]. Because lactase deficiency and milk protein intolerance are common in children with chronic diarrhea, replacing milk with yogurt is useful. The researchers studied clinical results in children with persistent diarrhea (3-36 months) and concluded that yogurt eating outperformed milk consumption in terms of clinical outcomes. Antibiotic-associated diarrhea may occur as a result of antibiotic treatment (AAD). Researchers discovered that individuals who consumed yogurt had less frequent diarrhea and considerably fewer overall days with diarrhea in one trial (23 vs. 60). The proportion of patients who did not have diarrhea differed considerably between those who had yogurt and those who did. Yogurt supplementation can minimize the occurrence and duration of AAD and is both simple and effective [15].

4.3. The treatment of chronic constipation

A study found that yogurt with or without probiotics improved stool frequency and abdominal pain in children with persistent bowel constipation. The effect of bifidobacterium longum was more noticeable [16]. Yogurt can also help with constipation during pregnancy. According to one study, yogurt dramatically relieved pregnancy constipation symptoms such as tension, anorectal blockage, ease of movement, consistency, and color of stool, as well as a considerable increase in stool volume [7]. Adding water-soluble fiber supplements to yogurt can help with functional constipation while having no negative side effects. In a study evaluating the effects of water-soluble fiber-rich yogurt on constipation symptoms in functionally constipated female adults, everyone in the water-soluble fiber-rich group improved significantly after 4 weeks of treatment. In the individuals studied, fiber-rich yogurt increased the amount of bowel movements, decreased stool stiffness, increased the frequency of tightness, the perception of incomplete emptying, and the feeling of anal rectum blockage. Additionally, consuming fiber-rich yogurt lowered overall colonic transit time [17].

4.4. Treatment of liver disease

In those with nonalcoholic fatty liver disease, probiotic yogurt lowers blood levels of LDL cholesterol, total cholesterol, and liver enzymes. Drinking probiotic yogurt, dropped blood concatenation of ALT, AST, TC, and LDL by 4.67, 5.42, 4.1, and 6.92%, respectively [18]. Yogurt decreased inflammation in a research looking at how yogurt influenced insulin resistance (IR) in obese female who has NAFLD and metabolic syndrome (MetS). When it comes to improving IR and liver fat in obese women having NAFLD and MetS, yogurt trumps milk. perhaps via enhancing lipid metabolism, reducing LPS, oxidative stress, inflammation, and LPS, as well as altering the flora in the digestive tract. By enhancing the liver condition and changing the make-up of the colonic microbiota, Lactobacillus Plantarum Q16 defends against HFD-induced NAFLD. The researchers observed that eating yogurt with Lactobacillus Plantarum Q16 enhanced serum and liver lipid profiles. By up - regulating the synthesis of CPT-1α, PPAR-α, and ATGL while down-regulating the synthesis of FAS, ACC, SCD-1,

DOI: 10.54254/2753-8818/3/20220477

SREBP-1c, and ATGL. The amount of liver lipids was decreased by plantarum Q16. Inside the mouse colon of HFD-fed mice, Lactobacillus Plantarum Q16 increased the variety and richness of the gut microbial community, encouraged the establishment of advantageous symbionts, and prevented the development of endotoxin-producing bacteria [19].

5. Conclusion

Yogurt has a function in health care and disease treatment because of its high nutritional value, and different strains of yogurt starter culture have a significant impact on the nutritional value, health care, flavor, state, and taste of yogurt. In terms of health benefits, yogurt can improve the intestinal environment, boost human immunity, improve intestinal digestion, lower cholesterol, and avoid lactose intolerance. Yogurt can also be utilized in the treatment of certain cancers, including colorectal and lung cancer. Yogurt can also be used to treat diarrhea, persistent constipation, and non-alcoholic fatty liver disease. However, some yogurt may have flaws since some manufacturers add a lot of substances to improve the taste of yogurt. This may have an effect on the effect of yogurt on the human body, and may even have an effect on health.

References

[1] Zhao Gaiming, Liu Huiqing," The Nutritional value and health care role of yoghurt," Henan Animal Husbandry and Veterinary Medicine, (12), 11-12 (1999).
[2] Yi Bing, "Immunity of Yogurt," Foreign Medicine (Hygiene), 02, 111-116 (2001).
[3] "Nutritional value and efficacy of yogurt," Northern Horticulture, 02, 115 (2013).
[4] N. H. El-Abbadi, M. C. Dao,S. N. Meydani, "Yogurt: role in healthy and active aging," The American Journal of Clinical Nutrition, 99(5), 1263S-1270S (2014).
[5] L. Wen,A. Duffy, "Factors Influencing the Gut Microbiota, Inflammation, and Type 2 Diabetes," The Journal of Nutrition, 147(7), 1468S-1475S (2017).
[6] Hu Yuming, Li Zimin, Yin Jin, et al., "The effect of drinking yogurt containing lactic acid bacteria/bifidobacteria on human intestinal flora," Modern Preventive Medicine, 41 (13), 2347-2349 (2014).
[7] M. Mirghafourvand, A. Homayouni Rad, S. Mohammad Alizadeh Charandabi, et al., "The Effect of Probiotic Yogurt on Constipation in Pregnant Women: A Randomized Controlled Clinical Trial," Iran Red Crescent Med J, 18(11), e39870 (2016).
[8] M. B. Zemel, J. Richards, S. Mathis, et al., "Dairy augmentation of total and central fat loss in obese subjects," Int J Obes (Lond), 29(4), 391-7 (2005).
[9] YogurtNutrition, "Yogurt provides the solution in lactose intolerance", 2013, https://www.yogurtinnutrition.com/wp-content/uploads/2013/10/Yogurt-and-Gut-Health.pdf.
[10] A. D. M. De LeBlanc,G. Perdigón, "Yogurt feeding inhibits promotion and progression of experimental colorectal cancer," Med Sci Monit, 10(4), BR96-104 (2004).
[11] J. J. Yang, D. Yu, Y.-B. Xiang, et al., "Association of Dietary Fiber and Yogurt Consumption With Lung Cancer Risk: A Pooled Analysis," JAMA Oncology, 6(2), e194107-e194107 (2020).
[12] A. Sharif, H. H. Kashani, E. Nasri, et al., "The Role of Probiotics in the Treatment of Dysentery: a Randomized Double-Blind Clinical Trial," Probiotics and Antimicrobial Proteins, 9(4), 380-385 (2017).
[13] A. Sharif, D. Kheirkhah, P. Shamsesfandabadi, et al., "Comparison of Regular and Probiotic Yogurts in Treatment of Acute Watery Diarrhea in Children," Journal of Probiotics & Health, 05 (2017).
[14] R. S. Beniwal, V. C. Arena, L. Thomas, et al., "A Randomized Trial of Yogurt for Prevention of Antibiotic-Associated Diarrhea," Digestive Diseases and Sciences, 48(10), 2077-2082 (2003).
[15] P. V. Guerra, L. N. Lima, T. C. Souza, et al., "Pediatric functional constipation treatment with Bifidobacterium-containing yogurt: a crossover, double-blind, controlled trial," World J

DOI: 10.54254/2753-8818/3/20220477

Gastroenterol, 17(34), 3916-21 (2011).
[16] H. J. Wook, P. Y. Ah, S. S. Kook, et al., "Effect of Yogurt Enriched Water-soluble Fiber on Functional Constipation," J Korean Soc Coloproctol, 23(5), 312-320 (2007).
[17] S. Nabavi, M. Rafraf, M. H. Somi, et al., "Effects of probiotic yogurt consumption on metabolic factors in individuals with nonalcoholic fatty liver disease," Journal of Dairy Science, 97(12), 7386-7393 (2014).
[18] C. Tang, W. Zhou, M. Shan, et al., "Yogurt-derived Lactobacillus plantarum Q16 alleviated high-fat diet-induced non-alcoholic fatty liver disease in mice," Food Science and Human Wellness, 11(5), 1428-1439 (2022).