

# Fermented Dairy Products are the Most Popular Commercial Industrial Products

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## Abstract

Fermented dairy products have been part of the diet of many civilizations for thousands of years. Due to their pleasant aroma and slightly sour taste, fermented milks have become a popular food all over the world, available on the market in numerous varieties that offer high nutrition and functional properties. Fermented dairy products are the most popular commercial industrial products not only because of their numerous nutritional and therapeutic characteristics, but also because of the introduction of probiotics into the human digestive system.

**Keywords:** Probiotics, Milk, Yogurt, Chese, Health

## Introduction

Today an increase in information of useful foods has driven to create foods with health benefits past satisfactory nutrition [1]. The final more of 30 years have appeared an expanded intrigued among shoppers in utilitarian food counting those containing probiotics. The nearness of probiotics in commercial food items has been claimed for certain health benefits. This has driven to businesses centering on diverse applications of probiotics in food items and making a unused era of 'probiotic health' foods.

Milk and its items is great vehicle of probiotic strains due to its inalienable properties and due to the truth that most milk and milk items are put away at refrigerated temperatures. Probiotics can be found in a wide assortment of commercial dairy items counting acrid and new milk, yogurt, cheese, etc. Dairy items play imperative part in conveying probiotic microscopic organisms to human, as these items give a reasonable environment for probiotic microbes that bolster their development and reasonability. A few variables require to be tended to for applying probiotics in dairy items such as practicality of probiotics in dairy, the physical, chemical and organoleptic properties of last items, the probiotic health impact, and the controls and labeling issues.

## Fermentation

Fermentation of milk is one of the old strategies for food conservation [2]. In spite of the fact that no records affirm the beginning of fermented dairy items, it is commonly

accepted that the roots of fermented dairy items date back to the Persian times in the Middle East. 'Yoghurt' was the to begin with title given to the fermented milk item by the old Turkish wanderers dwelling in Asia, in the 8th century. With the attack of the Tartars, Hans and Mongols, the aptitudes of making fermented milk items was moreover carried distant and wide, amplifying to Russia and Europe. With the development of civilization, the generation of different fermented milk items such as Laban Rayeb or Laban Khad, got to be a common hone in antiquated Egypt. Danone, the Europe based food giant, attempted the to begin with commercial generation of yogurt in 1922 in Spain and the craftsmanship of yogurt generation has been progressing ever since. Dairy items are presently an vital portion of the eat less in most parts of the world, and are made in numerous districts around the world. West European nations lead the world advertise in the generation and per capita utilization of yogurt and other aged items. The utilization of fermented dairy items, particularly yogurt, is expanding in Canada, Australia and USA. The Southeast Asian belt counting Iran proceeds to be the noteworthy locale for the generation of matured dairy items.

Growing concern around solid count calories in the worldwide populace has given a awesome driving force to the generation of useful food. In specific, dairy items have contributed altogether to the functional food showcase, where they account for around 60% of the deals of useful food in Europe.

Owing to the expanding mindfulness on the health benefits of the fermented dairy items nowadays, there are a assortment of them in the advertise. The dairy industry has come up with inventive varieties in aged items, on the premise of their dietary and/or textural characteristics. Not as it were does milk aging moderate the crucial supplements of milk, but also improves the nutritive quality in this manner giving extra health benefits to the customers. In diverse parts of the world, these fermented foods are utilized as an fixing in cooked item or are expended as condiment, snack, dessert, drink or spread. Variables such as source of milk (from diverse creatures), different microflora, expansion of supplements and additive and the preparing strategies like solidifying, drying and concentrating contribute to the varieties in aging of milk.

A number of life forms are utilized in making fermented dairy nourishments counting *Lactococcus lactis* ssp. *lactis*, *L. lactis* ssp. *cremoris*, *Lc. lactis* ssp. *lactis* biovar. *diacetylactis*, *Leuc. mesenteroides* ssp. *cremoris*, *Lactobacillus delbrueckii* ssp. *bulgaricus*, and *Streptococcus thermophilus*. Most of these starter life forms create lactic corrosive as the sole item of fermentation driving to milk coagulation. Lactic acid also avoids deterioration and increments the rack life of dairy items considerably. Health benefits of fermented dairy foods are moreover expanded due to fermentation.

Lactic corrosive microscopic organisms utilized as starter culture and other living beings utilized for making fermented items as well as other dairy foods do not survive in gastrointestinal tract; thus the slant has been to include probiotic microscopic organisms for giving extra health benefits past what is given by fermented dairy foods.

The transmission of antibiotic safe microbes among human and creatures may happen basically through food [3]. Fermented dairy items and fermented meats are expended without adequate warm treatment may act as a vehicle for antibiotic safe microbes between the creature inborn microflora and the human intestine microbiome. Lactic corrosive microscopic organisms broadly utilized as probiotics or starter societies in fermented food have the potential to serve as a have of antibiotic resistance qualities with the chance of exchanging the qualities in numerous lactic acid microscopic organisms and other pathogenic microbes. Enterococci are safe to cephalosporins and low levels of amino glycoside and clindamycin. *Lactobacilli*, *Pediococci*, and *Leuconostoc* spp. have been detailed to have a tall characteristic resistance to vancomycin. Numerous *Lactobacillus* spp. are resistance to bacitracin, cefoxitin, ciprofloxacin, fusidic acid, kanamycin, gentamicin, metronidazole, nitrofurantoin, norfloxacin, streptomycin, sulphadiazine, teicoplanin, trimethoprim/sulphamethoxazole, and vancomycin. Subsequently, microscopic organisms utilized as probiotics for people or creatures ought to not carry any transferable antimicrobial resistance qualities and strategies for

evaluation of antibiotic resistance of probiotics is vital for security evaluation.

Generally, strategies utilized for antibiotic vulnerability testing are based on phenotypic location of antibiotic resistance by circle dissemination and atomic recognizable proof of antibiotic resistance quality by multiplex polymerase chain response. Circle dissemination strategy is basic, solid, and official strategy utilized for schedule antimicrobial defenselessness testing. These days, numerous acknowledged and endorsed measures are distributed by the Clinical and Laboratory Standards Institute (CLSI). In this strategy plate impregnated with particular concentration of antibiotic are kept on the surface of agar medium already vaccinated with standardized inoculum of the test living being. The antibiotic diffuses into the agar and restrains germination and development of the test organisms and at that point the distances across of restraint development zones around the plate are measured. This method has capacity to test numerous microorganisms and antibiotics and too simple to decipher result. Multiplex PCR is utilized for the intensification of numerous target arrangements in a single response blend utilizing different sets of preliminaries. In this strategy more than one target antibiotic resistance quality grouping can be increased by sparing time and make it basic. Besides, the PCR amplicon is characterized by agarose gel electrophoresis.

*Lactobacillus* strains confined from commercial items cheese and yoghurt were safe to vancomycin and ciprofloxacin in expansion to gentamicin and streptomycin. Distinctive strains of *Lactobacilli* from Italian conventional fermented food showing phenotypic antibiotic resistance to tetracycline and erythromycin were found to contain the *tetM* and *ermB* qualities. Numerous probiotics such as *Lactobacilli*, *Lactococcus*, *Leuconostoc*, *Enterococcus* were safe to vancomycin, gentamicin, streptomycin, and ciprofloxacin. Segregates from conventional cheese *Leuconostoc mesenteroides* subsp. *dextranicum* and *Leuconostoc mesenteroides* subsp. *mesenteroides* were safe to vancomycin, trimethoprim, kanamycin, chloramphenicol, erythromycin, streptomycin, and tetracycline. Their assurance for antibiotic resistance quality by atomic PCR strategy prove the nearness of *erm(B)* and *tet (S)* gene.

## Milk

Among probiotics carrier food items, dairy drinks were the to begin with commercialized items that are still expended in bigger amounts than other probiotic refreshments [1]. Useful dairy refreshments can be gathered into two categories: braced dairy refreshments (counting probiotics, prebiotics, strands, polyphenols, peptides, sterol, stanols, minerals, vitamins and fish oil), and whey-based refreshments. Among the probiotic microbes utilized in the fabricate of dairy refreshments, *L. rhamnosus* GG is the most broadly utilized. Owing to *L. rhamnosus* GG corrosive and bile resistance, this probiotic is exceptionally

reasonable for mechanical applications.

Several variables have been detailed to influence the reasonability of probiotic societies in fermented milks. Corrosiveness, pH, broken down oxygen substance, redox potential, hydrogen peroxide, starter organisms, potential nearness of flavoring compounds and different added substances (counting additives) influence the practicality of probiotic microscopic organisms and have been recognized as having an impact amid the make and capacity of aged milks. Nowadays, a wide extend of dairy refreshments that contain probiotic microbes is accessible for customers in the advertise counting: Acidophilus milk, Sweet acidophilus milk, Nu-Trish A/B, Bifidus milk, Acidophilus buttermilk, Yakult, Procult drink, Actimel, Gaio, ProViva, and others.

Probiotics such as Lactobacillus and Bifidobacterium strains develop pitifully in milk due to their low proteolytic movement and failure to utilize lactose. These microbes also require certain compounds for their development which is lost in milk. To move forward development and reasonability of probiotics in dairy refreshments different substances have been tried in milk. Citrus fiber nearness in matured milks was found to upgrade bacterial development and survival of probiotic microbes in fermented milks. Expansion of soygerm powder has appeared certain positive impacts on creating fermented milk with *L. reuteri*. Soygerm powder may discharge imperative bioactive isoflavones during fermentation that may secure *L. reuteri* from bile salt poisonous quality in the little digestive system. Other substances incorporate fructooligosaccharides (FOS), aseinomacropetides (CMP), whey protein concentrate (WPC), tryptone, yeast extricates, certain amino acids, nucleotide antecedents and an press source were also reported. Moreover, the choice of probiotic strains and optimization of the fabricating conditions (both detailing properties and capacity conditions) are of most extreme significance in the reasonability of probiotic microscopic organisms in fermented milk.

## Yogurt

Yogurt is one of the unique sources of probiotics and proceeds to stay a well known probiotic item nowadays [1]. Yogurt is known for its dietary esteem and health benefits. Yogurt is created utilizing a culture of *L. delbrueckii* subsp. *bulgaricus* and *Streptococcus salivarius* subsp. *thermophilus* microbes. In expansion, other lactobacilli and bifidobacteria are also now and then included amid or after refined yogurt. The probiotic characteristics of these bacterial strains that frame the yogurt culture are still far from being obviously true. The reasonability of probiotics and their proteolytic exercises in yoghurt must be considered. Various components may influence the survival of Lactobacillus and Bifidobacterium spp. in yogurt. These incorporate strains of probiotic microbes, pH, nearness of hydrogen peroxide and broken down oxygen, concentration of metabolites such as lactic acid and acetic acids, buffering

capacity of the media as well as the capacity temperature.

Although yogurt has been broadly utilized as probiotics vehicle, most commercial yogurt items have low reasonable cells at the utilization time. Reasonability of probiotics in yogurt depends on the accessibility of supplements, development promoters and inhibitors, concentration of solutes, inoculation level, incubation temperature, fermentation time and capacity temperature. Survival and reasonability of probiotic in yogurt was found to be strain dependant. The fundamental variables for misfortune of practicality of probiotic life forms have been credited to the diminish in the pH of the medium and amassing of natural acids as a result of development and fermentation. Among the components, extreme pH come to at the conclusion of yogurt fermentation shows up to be the most vital figure influencing the development and practicality of probiotics. Metabolic items of natural acids during capacity may encourage influence cell reasonability of probiotics. The expansion of natural product in yogurt may have negative impact on the reasonability of probiotics, since natural product and berries might have antimicrobial exercises. Immunization with exceptionally tall level of probiotics with endeavors to compensate the potential practicality misfortune, might result in an second rate quality of the item. The show of probiotic was found to influence a few characteristics of yogurt counting: sharpness, surface, flavor, and appearance. Be that as it may, encapsulation in plain alginate beads, in chitosancoated alginate, alginate-starch, alginate-prebiotic, alginate-pectin, in whey protein-based framework, or by including prebiotics or cysteine into yogurt, might move forward the practicality and solidness of probiotics in yogurt.

## Cheese

Yogurt and milk are the most common vehicles of probiotics among dairy items [1]. Be that as it may, elective carriers such as cheese appear to be well suited. Cheeses have a number of focal points over yogurt and matured milks since they have higher pH and buffering capacity, exceedingly nutritious, tall vitality, more strong consistency, moderately higher fat substance, and longer rack life. Probiotics in cheese were found to survive the entry through the reenacted human gastrointestinal tract and altogether increment the numbers of probiotic cells in the intestine. Be that as it may, comparing the serving measure of yogurt to that of cheese, cheese needs to have higher thickness of probiotic cells and higher reasonability to give the same health benefits. Nowadays, there are over 200 commercial probiotic cheeses in different shapes, such as new, semi-hard, difficult cheese in the marketplaces. Semi-hard and difficult cheese, compared to yogurt as a carrier for probiotics, has generally moo suggested day by day admissions and require moderately tall vaccination level of probiotics (approximately 4 to 5 times). New cheese like bungalow cheese has tall prescribed every day admissions, constrained rack life with refrigerated capacity temperature.



It may, hence, serve as a nourishment with a tall potential to be connected as a carrier for probiotics.

### Other Products

Other dairy items counting quark, chocolate mousse, solidified aged dairy pastries, acrid cream, and ice cream can be great vehicles of probiotics [1]. Quark was tried with two probiotic societies to make strides its sustenance characteristics and the comes about appeared that probiotics can guarantee the most elevated level of utilization of fat, protein, lactose, and phosphorus mostly in skimmed milk. Chocolate mousse with probiotic and prebiotic fixings were created. Probiotic chocolate mousse was supplemented with *L. paracasei* subsp. *paracasei* LBC 82, exclusively or together with inulin and the comes about appeared that chocolate mousse is great vehicle for *L. paracasei*. Sour cream was explored as probiotic vehicle and the comes about appeared that utilizing sour cream as a probiotic carrier is demonstrated doable. Ice creams are among the food items with tall potential for utilize as probiotic vehicles.

### Gut Factor

Humans are complex organic ‘superorganisms,’ in which tremendous, different, and energetic microbial environments have coevolved performing critical parts in the definition of the have (human) physiology [4]. In this human–microbe crossover, the around 10<sup>14</sup> intestine microorganisms, collectively named intestine microbiota, essentially contribute to the host’s health status, affecting supplement bioavailability, glucose and lipid digestion system, sedate digestion system and poisonous quality, and safe framework function.

Substantial interindividual changeability exists inside the human intestine microbiota and various have components apply specific weight on the microbiome, counting have genome, count calories, age, and inevitable pharmacological intercessions. In addition, dysregulated host–microbiota intuitive have been specifically involved in the etiopathogenesis of a number of infection conditions, such as obesity, cardiovascular disease, inflammatory bowel diseases, and autism.

The aging prepare profoundly influences the structure and work of the human intestine microbiota and its homeostasis with the host’s safe framework, coming about in more prominent defenselessness to systemic contaminations, lack of healthy sustenance, side impacts of solutions, and conceivably contributing to the movement of unremitting illnesses and frailty.

Probiotics, prebiotics, and their combinations may lighten common gastrointestinal disorders in the elderly by tweaking microbial action and resistant status. Comprehensive approaches based on the combination of distinctive ‘omic’ sciences ((meta)genomics, microbiomics, trascriptomics, proteomics, metabolomics) are accepting

significant intrigued, as they seem shed newlight on the complementary impact between age-related changes in the intestine microbiota and the physiology of more seasoned people, as well as distinguish conceivable targets for pharmaconutritional mediations pointed at progressing the wellness of more seasoned adults.

As for sarcopenia, a superior understanding of the advantageous relationship between the intestine microbiota and the aging life form is of most extreme significance to plan mediation techniques. Undoubtedly, the intestine microbiota seem contribute to etiopathogenesis of sarcopenia, being included in the control of fiery and redox status, splanchnic extraction of supplements, fat mass statement, and affront affectability. In expansion, the intestine microbiota may profoundly impact (or be impacted by) the bioavailability and bioactivity of most dietary components proposed as cures against sarcopenia. For occurrence, colonic microbiota might balance the metabolic destiny of dietary polyphenols and other candidate CRM and EM, by changing over these compounds into bioactive substances.

Given the significance of the intestine microbiota in the direction of human physiology, more investigate is justified to investigate the potential part of its control in the administration of sarcopenia. Fatty Acids

Fatty acids have different parts in digestion system [5]. They may serve as vitality sources for the body, taking after beta-oxidation. They moreover can be utilized basically and to create bioactive compounds. In any case, a few sorts of fatty acids have been related to fiery perspectives and unremitting infections, counting T2D. These incorporate particularly SFA, trans-fatty-acids, u-3 and u-6 fatty acids that can encourage make COX-2 pathway products.

Omega-3 fatty acids are fundamentally determined from seafood and fish (in spite of the fact that the essential source is phytoplankton) and incorporate EPA and DHA, but also linolenic and arachidonic acid, moreover found in plant foods. Omega-6 fatty acids such as linoleic acid are for the most part found in plant-based foods and tend to be found in high concentrations in cooking oils and ultraprocessed foods. The proportion of both sorts of fatty acids devoured is curiously, as u-3 fatty acids can be turned into antiinflammatory resolvins, whereas u-6 fatty acids can be adjusted by COX-1 or 2 to result in for the most part proinflammatory prostaglandins, in spite of the fact that not all resolvins are antiinflammatory and not all prostaglandins are proinflammatory. A dietary proportion of or maybe 1-4:1 is suggested, but the proportion in a commonplace Western type slim down is more often than not around 15-20:1, likely favoring proinflammatory pathways.

A proinflammatory impact in people has been found for trans-fatty acids. In nature, the arrangement of the vast majority of carbon <sup>1</sup>/<sub>4</sub> carbon double bonds is cis. In spite of the fact that a few trans-fatty acids are delivered e.g., by the

microbes of ruminants, making their way into meat and dairy items, the vast majority of trans-fatty acids in the food supply begin from heating and hardening/hydrogenating of PUFAS and are found in lipid-rich, heatprocessed food things such as French fries or snacks such as potato chips. These trans carbon ¼ carbon twofold bonds are comparable in structure to SFA and a few of the negative impacts may be related to this likeness. Their suggested admissions is <1% in terms of vitality prerequisite. Their components of activity stay to be completely settled, but incorporate enactment of NF-kB, upgraded mitochondrial push and ROS generation, expanded push in the endoplasmic reticulum, and expanded capacity of lipids in the liver and a move from HDL-C to higher LDL-C play a part. Human intercession trials with trans-fatty acids have failed to appear clear impacts on T2D-related hazard markers such as affront affectability and have endured from inconsistencies.

In differentiate to the trans-fatty acids, admissions of whole-fat dairy items has been related with a lower weight predominance, which was clarified by the for the most part more advantageous dietary designs of people devouring dairy items. Be that as it may, SFA shows up to fortify irritation comparative as LPS, as they tie through the same receptor (TLR4), coming about in aggravation of the fat tissue by means of NF-kB actuation, as highlighted in a later publication. Hence, the common suggestion is to expend <7% (communicated as day by day vitality admissions) in shape of SFA. SFA too shows up to result in a more unbending cell membrane and utilization has been related to lifted LDL-C and lower HDL-C. Be that as it may, a coordinate interface between SFA admissions and T2D has been disputable, and numerous metaanalyses and large-scale imminent thinks about have failed to appear a clear relation.

### Nutritional Benefits

The accessibility of dairy items with positive wholesome benefits, in expansion to yogurt and acidophilus milk, is anticipated to increment in the future [6]. The development of the utilitarian foods region has driven to a developing buyer intrigued in refined dairy items with upgraded dietary benefits from the joining of bifidobacteria and other probiotic microscopic organisms. Probiotic microscopic organisms, particularly bifidobacteria and lactobacilli, are ordinary tenants of the human colon and advantageously influence human health by making strides the adjust of intestinal microflora and making strides mucosal protections against pathogens. Extra health benefits incorporate upgraded safe reaction, diminishment of serum cholesterol, vitamin amalgamation, anticarcinogenic action, and antibacterial action. A day by day admissions of at slightest 108 to 109 reasonable cells, which may be accomplished with a day by day utilization of at slightest 100 g of a item containing between 106 and 107 reasonable cells per gram, has been recommended as the least

admissions to give a helpful effect.

The most well known food conveyance frameworks for probiotic societies have been crisply matured or unfermented dairy foods, counting milk, yogurt, cheeses, ice cream, and desserts. Fruitful joining of these probiotic microbes into refined dairy items must recognize the challenges related to the insecurity of a few intestinal strains of probiotic microscopic organisms in refined milk items. The environment ordinary of numerous yogurt and other refined dairy items, counting the low pH and the oxygen consuming conditions of generation and bundling, can result in diminishes in the number of bifidobacteria in these dairy items to underneath the restorative least. In a few cases, alterations of the conventional preparing convention are essential to improve the practicality of the probiotic microscopic organisms. In expansion to keeping up the practicality of the probiotic microscopic organisms in the refined dairy items through the time of utilization, it is basic that the joining of the probiotic microscopic organisms does not antagonistically influence the enhance, surface, and other quality traits of the refined dairy items. The improvement of cultured dairy items with made strides restorative benefits will give various challenges and rewards to food scientists.

### Conclusion

Probiotics are most often found in fermented milk products. As a large part of the immune system is located precisely in the walls of the gastrointestinal system, the balance of intestinal flora plays a key role in the immune function of children, not only adults. The balance, especially in the case of children, is often disturbed by the environment, a poor diet rich in sugars and poor in fiber, diseases and conditions such as irritable bowel syndrome and taking antibiotics. The bacteria of the digestive system are necessary for its normal physiological function, but some can also be harmful.

### Referenes

1. Song, D.; Ibrahim, S.; Hayek, S. (2012.): „Recent Application of Probiotics in Food and Agricultural Science“ in Rigobelo, E. C. (ed): „Probiotics“, InTech, Rijeka, Croatia, pp. 7. – 10.
2. Prasad, S. N. (2016.): „Novel Dairy Probiotic Products“ in Foerst, P.; Santivarangkna, C. (eds): „Advances in Probiotic Technology“, CRC Press, Taylor & Francis Group, Informa Business, Boca Raton, USA, pp. 338. – 340.
3. Veerapagu, M.; Jeya, K. R.; Khalifa, A.; Sankaranarayanan, A. (2022.): „Determination of Antibiotic Resistance“ in Dwivedi, M. K.; Amaesan, N.; Sankaranarayanan, A.; Begum, R. (eds): „Biosafety Assessment of Probiotic Potential“, Springer Science+Business Media, LLC, New York, USA, pp.

71. – 73.

4. Calvani, R.; Miccheli, A.; Bernabei, R.; Marzetti, E. (2013.): „Diet and Aging: Role in Prevention of Muscle Mass Loss“ in Watson, R. R.; Preedy, V. R. (eds): „Bioactive Food as Dietary Interventions for the Aging Population“, Academic Press, Elsevier, San Diego, USA, pp. 117.
5. Bohn, T.; Samouda, H.; Alkerwi, A. (2022.): „Dietary patterns and type 2 diabetes-relationship to metabolic syndrome and inflammation“ in Hébert, J. R.; Hofseth, L. J. (eds): „Diet, Inflammation, and Health“, Academic Press, Elsevier, London, UK, pp. 330. – 331.
6. Boylston, T. D. (2006.): „Dairy Products“ in Hui, Y. H.; Nip, W. K.; Nollet, L. M. L.; Paliyath, G.; Simpson, B. K. (eds): „Food Biochemistry and Food Processing“, Blackwell Publishing, Ames, USA, pp. 612.