



Advances in DAIRY RESEARCH

Edited by: Preethi Kartan



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Advances in Dairy Research

Milk is an ingredient that is consumed globally. It is the only food that provides a well balanced array of essential nutrients including high-quality protein, fat, carbohydrates, vitamins and minerals (e.g calcium) in the form which is palatable, digestible and sanitary. Milk can be called as whole meal and "perfect food", contributing dietary energy requirements for vegetarians. The major milk proteins are the caseins and whey proteins and carbohydrate component is lactose. It is predicted that milk consumption is ought to increase globally in the coming years in line with the increasing world population, and there exist a better return potential to provide milk and milk products for human consumption. The broad range of nutritional content and high moisture creates a favorable environment for the growth of microorganisms in milk and its products. Microbes can enter milk via the cow, air, feeds, milk handling equipment and milker. The most common method of milk preservation is boiling. For large scale consumption, milk is pasteurized before refrigeration at low temperature. Pasteurization is heating of milk or other dairy products to a temperature of 62°C for 30 minutes or to at least 71°C for 15 second which destroys all the pathogenic microorganisms without seriously affecting the composition of milk. However, protein denaturation is one of the negative side effects of pasteurization which persuaded to develop non thermal technologies for the reduction microbial load without changing the protein and nutritional content. Various fermented and non fermented dairy products are readily available in the market and high in demand from the consumers like Cheese, yogurt, yakult etc. Dairy starter cultures are actively growing cultures of Lactic acid bacteria (LAB) to carry out these fermentation processes. LAB starters are primarily used because of their capability to produce lactic acid from lactose. Lactic acid bacteria make the specific end-products that impart flavor and modify the texture of the final product. Cheese is the most widely consumed dairy product in the world. Enzyme, chymosin can specifically break down milk κ -casein to form insoluble para- κ -casein, resulting in milk coagulation, a process that is used in making cheese. Phage sensitivity of lactic cultures constitutes a critical issue in dairy production, when the starters are selected for industrial use. Many strategies have been developed, - insensitive mutants or the conjugal transfer of resistance plasmids has been applied. Advances in genetics and molecular biology have provided opportunities for genomic studies of these economically significant organisms and engineering of cultures that focuses on rational improvement of the industrially useful strain. Advances in membrane technology, microbiological techniques and analytical testing help the dairy industry produce new products, improve processing efficiency and gain greater control over manufacturing processes. Membrane separation technology brought a significant change in dairy food processing as milk is an ideal liquid for membrane filtration due to its composition. Furthermore, much research has been published on the health benefits associated with ingesting cultured dairy foods and probiotics, as milk and milk products are an ideal delivery medium for the probiotic bacteria. The aim of this review is to signify some of the major scientific advances made in Non thermal dairy processing technical approaches, starter and nonstarter lactic acid bacteria during the past 10 yr, including genomic studies on dairy starter cultures, engineering of culture attributes, advances in phage control and transgenic animal technology will continue to benefit from the discovery of novel functional molecules in milk.



Preethi is a postgraduate in Biotechnology from University of Leeds, UK. She is currently working as a Scientific Associate at one of the CRO's in India and her interest lie in life sciences related writing.