

# Development of Methods Related to Dairy Science

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## COMMENTARY

Dairy science and technology involves the study of the chemistry of milk constituents, the control of microorganisms (desirable and undesirable) associated with milk and dairy products, all branches of engineering related to milk processing, and the economics of milk processing, distribution, and retailing. The American Dairy Science Association (ADSA) is a nonprofit professional organization for the advancement of dairy science, with its headquarters at Savoy, Illinois. The ADSA has ~4500 members, involved in research, education and industry; it primarily serves the United States and Canada, but has members in most dairying countries and can be considered as the most senior society for dairy science and technology. The ADSA caters to both aspects of the dairy industry, namely, dairy husbandry and dairy technology. Its objectives include care and nutrition of dairy animals; management and economics of dairy farms and product manufacture; sanitation throughout the dairy industry; and processing of dairy-based foods.

Modern dairy plants are large, automated, specialized production facilities. They exist as parts of complex businesses and organizations that frequently have interests in areas other than dairy. Within these plants and organizations, in common with many other professions, there is a call for graduates to develop generic skills such as communication, capacity to cope with and manage change, and an ability to lead and motivate staff. With the increasing rate of change within companies and the industry, employers are demanding greater flexibility in graduates.

### New concepts in technology of dairy products

Cream powder, sterilized cream, frozen products, ice-cream mix, low, medium, high heat milk powder, milk based infant foods. Advances in starter cultures and their application, butter, butter spread, butter powder, cheese and cheese spread, probiotic products. Milk

processing is the procedure that includes various steps to start dairy farms like milk collection from cattle, pasteurization, clarification, homogenization, packing of the milk and finally transportation to processing.

However, the removal of fat decreases the amount of certain nutrients in the milk, including vitamins E and K. Lactose-free milk is processed to break down lactose, a natural sugar found in milk products. Lactose-free milk is also a good source of protein, calcium, vitamins, and minerals. Breed improvement programme needs to be implemented through artificial insemination using the sperm of bulls with a good lineage. Artificial insemination enables many cows to be fertilised, using the same sperm, and also permits monitoring of the breeding process. Moreover, it prevents the spread of venereal diseases in the herd. Farmers who are contracted to supply liquid milk for human consumption (as opposed to milk for processing into butter, cheese, and so on—see milk) often have to manage their herd so that the contracted number of cows are in milk the year round, or the required minimum milk output is maintained. This is done by mating cows outside their natural mating time so that the period when each cow in the herd is giving maximum production is in rotation throughout the year.

Northern hemisphere farmers who keep cows in barns almost all the year usually manage their herds to give continuous production of milk so that they get paid all year round. In the southern hemisphere the cooperative dairying systems allow for two months on no productivity because their systems are designed to take advantage of maximum grass and milk production in the spring and because the milk processing plants pay bonuses in the dry (winter) season to carry the farmers through the mid-winter break from milking. It also means that cows have a rest from milk production when they are most heavily pregnant. Some year-round milk farms are penalised financially for overproduction at any time in the year by being unable to sell their overproduction at current prices.

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