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Clean Milk Production – A Practical Approach

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The milk - as it is meant to be the first and sole food of offspring of mammals - is more or less a complete food as it contains in a balanced form all the necessary elements for building up and maintaining of human and animal body. In addition, it contains immunoglobulin which protect the newly born against number of diseases. Milk is also a perishable product. Milk is an ideal media for micro-organisms and as it is a liquid it is very easily contaminated and invaded by bacteria. Thus, milk can transmit diseases of microbial origin to people from sick animals and/or people carrying certain diseases and contaminating the milk with pathogenic bacteria during its handling. Dairy industry strictly controls the quality of incoming milk from dairy farmers to produce good quality milk

products. If the milk quality does not fulfill the set minimum quality standards, it is rejected which means economical loss to the farmer. Hence, it is very important to produce clean and hygienic milk at farm level to obtain maximum profit out of it.

Clean Milk

Clean milk is generally defined as “milk drawn from the udder of healthy animals, which is collected in clean dry milking pails and free from extraneous matters like dust, dirt, flies, hay, manure etc. Clean milk has a normal composition, possesses a natural milk flavor with low bacterial count and is safe for human consumption”. Production of clean milk results in milk that is safe for human consumption and free from disease producing microorganisms, has a high keeping quality and high com-



Fig. 1: Potential sources of contamination of milk (PC: Author)

mercial value, it can be transported over long distances and it is a high-quality base product for processing, resulting in high quality products.

Economics of Clean Milk Production

When setting standards for clean milk production, it is important that the standards reflect the local conditions. If milk is boiled before use and consumed within hours of production, high capital investments to improve hygiene may not be an economic necessity. With an increasing time between milking and consumption, hygienic measures should

improve. At the same time, with an increasing scale of farming, there is more room for investments in hygienic practices. The cost of clean milk production should not exceed the benefit of the farmers. Milk payments should be an incentive to improve the hygiene, and clean milk production should be

financially rewarded.

Strategies for clean milk production

The first step to clean milk production should be education and training of milk producers on hygiene, housekeeping, sanitation, milking methods and good animal husbandry practices.

Awareness and training: Educational aids and programs should be organized for the farmers for making them aware of the importance of clean milk production. This should be in the form of charts/posters dis-

played at village, society and milk collection centers.

Feeding practices: The feeds and fodder of the animals should not introduce directly or indirectly microbiological or chemical contaminants in the milk in amounts that is unacceptable to health. Feed fodder and silage should be procured from a reliable source and should be stored properly.

Housing management: The shed should be comfortable and clean with suitable arrangement to dispose dung, urine, feed and fodder residues. There should be proper supply of clean drinking water and electricity. The shed should be washed before milking. Proper sanitation and disinfection of animal houses is very important. It can be done by washing the houses with boiling water, flame blower or by using suitable disinfectants such as formaldehyde, phenols, cresols, washing soda, quick lime, bleaching powder etc.

Handling of milking vessels: The milking vessel should be made of stainless steel. It should be cleaned before and after milking with hot water and certified detergents/chemicals. It should have small mouth. The milker should wear clean

clothes and maintain personal hygiene. He should wash his hands before milking and should not spit or smoke. Shaving the hair of the hind legs and tail should be carried out routinely. Also, the fore milk should be discarded in a proper place.

Udder Hygiene: Effective milking practice is one important criterion in order to produce safe and suitable milk; failure of which may introduce contamination of milk. With unsuitable udder hygiene, the microorganisms present on the teat skin can contaminate the milk during milking or through the teat tip will penetrate the teat canal increasing the possibility of mastitis. Hence it is necessary to implement hygienic-prophylactic measures in maintaining cleanliness and udder health before and after milking of dairy herds, with the aid of disinfecting agents. There are many procedures for udder hygiene prior to milking such as: washing by spraying water and wiping of teats, washing of teats with a cloth immersed in warm disinfectant solution and drying with a dry cloth, immersing of teats in disinfectant and wiping with a paper cloth. The implementation of udder hygiene after milking is a very rational method for

maintaining acceptable udder health status, and is conducted by immersing teats in a disinfecting agent. The benefits are manifested through a decrease in post secretory milk contamination, reduction of udder infections by so-called environmental microbes, and by a decrease in the number of subclinical mastitis. Nowadays, the priority in conducting udder hygiene is given to ecologically acceptable disinfecting agents that are not harmful to animals and the environment.

Health management: Good animal husbandry practices including regular monitoring of disease such as mastitis should be a part of the routine work. During milking, using teat dips, and washing of udder should be an ongoing activity of the dairy farm. Sick animal shed should be far away from the milking barn and separated from the healthy ones. The healthy animals must be milked first. Improper use of veterinary drugs should be avoided.

Milk collection and transportation: There should be a provision of bulk cooling tanks in order to reduce the bacteriological load in the milk immediately after collection. Introducing differential pricing system

based on bacteriological quality of milk will help in overall improvement of milk quality reaching the dairy dock.

Other prerequisites for clean milk production include hygienic norms, good animal husbandry practices and proper handling, storage and transportation of milk are important elements to produce quality milk. The lids of the milk cans should fit tightly preventing from entry of rain and dust. The cans should be stored in an inverted condition on stand.

Excessive agitation while transportation should be avoided. When milk is agitated, the milk fat is destabilized which becomes easily oxidized. The milk tanker should have proper insulation. The number of spoilage bacteria in raw milk depends on the level of hygiene during milking and the cleanliness of the vessels used for storing and transporting the milk. During the first 2–3 hours after milking, raw milk is protected from spoilage by inherent natural antibacterial substances that inhibit the growth of spoilage bacteria. However, if the milk is not cooled, these antibacterial substances break down causing bacteria to



multiply rapidly. Cooling milk to less than 10°C may prevent spoilage for up to three days. High storage temperatures result in faster microbial growth and hence faster milk spoilage.





