

## Clean Milk Production- An Overview

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### **Abstract**

The composition and hygiene of milk are considered when evaluating its quality, with management of healthcare, breeding, feeding, and fodder production having the greatest impact on the compositional quality. India is the country that produces the most milk globally. 20% of the world's milk production comes from India. According to BAHS, 2020-21, India produces 198.44 million tonnes of milk annually, an increase of 5.69% from the previous year. The per capita availability of milk in the country was 176 grams per day in 1990-91 which has increased to 406 grams per day in 2020-21 whereas the recommendation of ICMR is 280 gm/day/capita. The purpose of this article is to ascertain the level of knowledge and practices of dairy farmers regarding clean milk production.

### **Introduction:**

Clean milk is defined as milk that comes from healthy dairy animals, has a typical flavour, contains only the allowed amount of bacteria, and is essentially free of adulterants, pathogens, different toxins, aberrant residues, pollutants, and metabolites (Altekruse and Swerdlow, 1996). The objective of clean milk can be achieved by practical application of science based system such as Hazard Analysis Critical Control Point (HACCP). Not only it should produce quantum milk, but must also be free from debris, microbes and must remain so, till it is consumed. Raw milk quickly becomes sour when it is stored for long periods at high ambient temperatures prevalent in tropical and subtropical countries. This is because, the inherent lactic acid bacteria and contaminating microorganisms from milk vessels or the environment break down the lactose in milk to lactic acid. When sufficient lactic acid has accumulated, the milk becomes sour and coagulates. Raw milk that contains too much lactic acid, even if it does not appear to be curdled, will coagulate when heated. This acidity is known as “developed acidity” and such milk is not acceptable for sale (Sohrab, 1997).

### Sources of Milk Contamination:

Milk contamination can be broadly categorized into internal and external factors.

#### ❖ Internal factors

- Udder tuberculosis or mastitis can contaminate the udder and spread several microorganisms.
- When an animal acquires an infectious condition, many of the infectious disease agents are also secreted in the milk; therefore, maintaining good animal health is essential for producing clean milk.
- Animal foremilk, or the initial few streams of milk, should be discarded since it may contain more bacteria due to bacteria entering the udder through the teats.

#### ❖ External factors

- Milker hygiene is important as milker should be healthy and equally should have good habits.
- Milk storage facility and utensils should be clean and dry
- Method of milking: feed and water used in daily routine should be clean, properly stored and easily accessible to animals. Feed ingredients should be stored in moisture-free conditions and should be free from industrial and environmental contaminants, pesticides, insecticides, fungicides, fumigants, aflatoxins as well as heavy metals.

The environment where milk is produced should be free of dust, insects, and mosquitoes. The milking parlour should be regularly washed down and cleaned using the right disinfectants.

### Undesirable changes in milk by pathogens

- Due to renin, *Streptococcus liquifaciens* causes rapid milk coagulation and protein degradation at low milk acid levels.
- Heat-resistant bacteria like *Bacillus coagulans* and *Bacillus collidolactis* can survive in pasteurised milk, grow at high temperatures, and coagulate the milk.
- The *E. coli* bacteria produces a sticky coating and an unpleasant flavour.



- The bacteria *Pseudomonas fragi*, *Pseudomonas fluorescence*, *Achromobacter lipolyticum*, and *Achromobacter lipidus* break down fats and produce undesirable milk colours.
- Moulds and yeast found in milk and milk products produce gas and acid.

#### **Advantages of clean milk production**

- Protection against milk-borne diseases.
- Safe for human consumption.
- Better keeping quality.
- High commercial value.
- Helps to produce good quality dairy products.
- Ease of transport over long distances.

#### **Management Practices for Clean Milk Production:**

##### **❖ Dietary Management**

The quantity and quality of milk are impacted by a healthy diet. Food that is extremely fine or dusty should not be provided while milking. One hour prior to milking, dairy animals should be fed. Silage and wet crop wastes shouldn't be put at the milking site since they could cause the milk to smell bad. Animal feed needs to be devoid of toxins and antinutritional factors. The feed used for dairy animals needs to be devoid of heavy metals, fumigants, fungicides, herbicides, insecticides, and other pesticides. The other food component should be taken into consideration when choosing minerals or supplements. The feed of dairy animals must include vitamin E and selenium.

##### **❖ Habitat Management**

- Animal house should be ventilated. Bedding materials such as sand or sawdust should be laid in cold weather or damp or swampy floors. Wall cracks in the animal house should be filled. Tie the animals at such a distance that they cannot lick each other. Each animal should be provided with enough lodging area in the shed. The animal house should have a proper drainage system. The collection of urine in the pit should be outside the animal house. Animal dung should be collected and disposed of away from the animal home. The animal



house should be cleaned daily. Before milking, the milking area should be completely cleaned.

#### ❖ **Health Management**

The veterinarian should routinely check the dairy animals for brucellosis and TB. Milking animals should receive routine vaccinations against brucellosis, foot and mouth disease, and strangulation disease. Animals with contagious illnesses need to be kept apart from herds of healthy animals. In dairy farms, appropriate dry cow therapy should be encouraged. Inappropriate or prophylactic use of antimicrobial agents should be minimized. To check for faecal contamination of milk, routine colony counts on bulk milk tanks should be performed. Animals should be sorted based on the animal body's condition score. Swelling of udders should be detected based on counting the number of somatic cells. An udder quarter is considered healthy if it has a Somatic Cell Count is less than 100,000 cells/ml and if free of mastitis pathogens (Jones, 2009).

#### ❖ **Post milking care**

Raw milk quality encompasses criteria relating to composition (fat, protein, lactose, milk solids etc.) and hygiene (total bacterial count and SCC). If the post milking care is not done carefully then the benefits of producing clean milk will not be available. The animal should stand for at least 15 minutes after milking. To maintain the quality of milk, it should be cooled to a temperature below 5 °C in the refrigerator as soon as early possible. The sooner it is cooled after milking, the better its quality. Cooling the milk within 2 hours of milking slows the growth of bacteria. The distribution of milk to the consumers should be regular.

#### **Challenges in the production of clean and safe milk:**

1. Lack of technical knowledge about clean milk in the farmers.
2. The specialty of Indian dairy is that most of the producers here have 1-3 milch cattle which is a village-based activity.
3. The quality of the milk produced is compromised due to the lack of adoption of hygienic milk production practices.
4. Dairy innovations are not adopted on a large scale by dairy farmers due to a lack of extension services.



5. India has a unique pattern of milk production, processing, consumption, and marketing which cannot be compared with any developed country.

6. Ignoring the pricing policy of milk in India.

### Conclusion

At present clean milk production has not been fully adopted by the milk producers. Most of the farmers have a moderate level of knowledge and adoption in various aspects of the clean milk production system. There are many flaws in our management policy for clean milk production which should be considered and rectified. Efforts should be made to convince dairy farmers to adopt clean milk production. Clean milk production should be motivated through organizing training and demonstrations at the field level. The public should be made aware of the health hazards associated with contaminated and raw milk so that consumption of unhygienic raw milk can be avoided. Local livestock development officers, livestock supervisors, and extension workers should make efforts in this direction. Also, clean milk should be marketed efficiently at a good price.

### References

- Altekruse S. F. and Swerdlow D. L. 1996. The changing Epidemiology of food borne diseases. *The American Journal of Medical Sciences*, **311**: 23-29.
- Jones G. M. 2009. Cleaning and Sanitizing Milking Equipment. Extension Dairy Scientist, Milk Quality and Milking Management, Virginia Tech.
- Sohrab. 1997. HACCP through ISO 9000 Quality Management System. *Indian Food System*. Indian Food Industry. May-Jun, **16** (3).

