

Clean Milk, Healthy Herd, Better Returns

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A Scientific Guide to Hygienic Milk Production for Dairy Farmers

Milk is one of the most important sources of nutrition and income in rural households. For dairy farmers, however, producing a good quantity of milk is only part of successful dairy farming. **Maintaining its hygienic quality from milking to consumption is equally important.** Milk is highly nutritious and therefore provides a favourable environment for the multiplication of microorganisms. Poor hygiene during milking, contaminated utensils, dirty udders,

infected mammary glands, unclean housing and improper storage can rapidly deteriorate milk quality. Thus, **clean milk production is not a single activity performed at the dairy plant; it begins at the farm and continues throughout milking, collection, storage and transportation.**

What Is Clean Milk?

Clean milk refers to milk obtained from a healthy animal under hygienic conditions and handled in a manner



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that minimizes contamination with microorganisms, dirt, foreign materials and undesirable residues. The quality of milk can be affected at several points:

**Animal → Udder → Milker →
Milking equipment → Storage →
Transportation → Consumer**

Failure at any one of these stages can compromise the quality of the final product.

and increase the risk of bacterial contamination. Regular observation of the udder and milk can help farmers identify problems early.

Signs that require attention include:

- ☞ Swelling or abnormal hardness of the udder
- ☞ Heat or pain in the udder
- ☞ Abnormal milk colour or consistency



Healthy Animal: The First Requirement

Clean milk production starts with a **healthy dairy animal**. Animals should be regularly monitored for signs of disease, particularly disorders affecting the udder. Sick animals should receive timely veterinary attention and should be managed appropriately to prevent transmission of infection within the herd. Special attention should be given to **mastitis**, one of the major health and economic problems of dairy animals. Mastitis can alter milk composition, reduce milk yield

- ☞ Clots or flakes in milk
- ☞ Sudden reduction in milk yield
- ☞ Changes in the appearance of individual quarters

Early diagnosis and appropriate veterinary treatment can prevent further economic losses.

A Clean Shed Means Cleaner Milk

The cleanliness of the dairy environment has a direct bearing on milk hygiene. Dung, urine, mud, dust and contaminated bedding can come into contact

with the udder and milking equipment. Therefore, the milking area should be kept **clean, dry and well ventilated**.

Farmers should regularly:

- ☞ Remove dung and urine from the shed.
- ☞ Maintain proper drainage.
- ☞ Keep bedding clean and dry.
- ☞ Prevent excessive accumulation of dust and manure.
- ☞ Keep feed and water troughs clean.
- ☞ Maintain a separate and hygienic milking area.

Current ICAR farmer advisories emphasize maintaining clean housing and adopting proper hygiene during milking and milk handling as important components of clean milk production.

Udder Hygiene: The Critical Point

The udder and teats are the immediate source from which milk enters the milking vessel. Therefore, **udder hygiene is one of the most important steps in clean milk production**. Before milking, visibly dirty udders should be cleaned appropriately using clean water and suitable hygiene procedures. The teats should then be dried properly using a clean towel or preferably a single-use material. Pre-milking teat preparation helps reduce the microbial load on the teat surface and minimizes the chance of transferring contaminants into milk. Where appropriate, **pre- and post-milking teat dipping** should be

incorporated into the milking routine as part of mastitis-control programmes. ICAR's recent dairy advisories specifically emphasize consistent teat dipping along with proper milking hygiene for udder health and clean milk production.

Clean Hands, Clean Milk

The person performing milking is another important link in the hygiene chain. Hands should be washed properly before milking, and the milker should maintain personal cleanliness throughout the process.

The milker should avoid:

- ☞ Handling manure immediately before milking
- ☞ Touching dirty surfaces and then milk
- ☞ Using dirty towels
- ☞ Coughing or sneezing directly over milk
- ☞ Smoking or eating while handling milk

A few minutes spent maintaining personal hygiene can protect the quality of the entire milk produced during a milking session.

Clean Milking Equipment Is Essential

Even if the animal and milker are clean, contaminated equipment can introduce large numbers of microorganisms into milk. Milk containers, buckets and other equipment should therefore be:

1. Cleaned immediately after use.
2. Washed thoroughly with an appropriate cleaning procedure.

3. Rinsed properly.
4. Sanitized when required.
5. Allowed to dry in a clean environment.
6. Protected from dust, insects and other contaminants.

Smooth, non-porous and easily washable materials are preferable for milk-contact surfaces.

Modern dairy facilities increasingly combine hygienic milking systems with immediate cooling and milk-quality monitoring to minimize contamination and bacterial multiplication.

The First Few Streams of Milk Should Be Examined

The first streams of milk can provide useful information about udder health. Farmers should observe the milk for abnormal colour, clots, flakes or other changes. Abnormal milk should not simply be mixed with normal milk. This simple observation can help identify udder abnormalities at an early stage and encourage timely veterinary examination.

Rapid Cooling: Protecting Milk Quality After Milking

Once milk leaves the udder, **time and temperature become critical factors**. Milk held for long periods at warm temperatures provides favourable conditions for bacterial multiplication. This can increase acidity and accelerate deterioration of milk quality. Therefore, milk should be cooled as

quickly as practically possible after milking. For organized dairy farms and collection systems, bulk milk cooling facilities can play an important role in maintaining milk quality before transportation. ICAR's modern dairy facilities similarly combine hygienic milking with bulk milk cooling and quality monitoring.

Remember:

Clean milk + rapid cooling = better keeping quality.

Safe Handling and Transportation

Good-quality milk can lose its quality if it is poorly handled after milking. Milk should be transported in clean, covered containers that protect it from dust, insects, sunlight and other sources of contamination. Containers should not be used for storing chemicals, pesticides or other materials. Milk should reach the collection centre or processing facility as quickly as possible, particularly when refrigeration facilities are limited.

Veterinary Drugs and Milk Withdrawal Period

Another important aspect of milk safety is the presence of **veterinary drug residues**. When an animal is treated with antibiotics or other medicines, residues may remain in its milk for a specific period. Farmers must therefore follow the veterinarian's instructions regarding the

withdrawal period of the medicine. Milk from animals under a withdrawal period should not be supplied for human consumption. This is important not only for consumer safety but also for maintaining the quality and reputation of the farmer's milk supply.

Nutrition and Clean Milk Production

Good hygiene must be supported by good animal nutrition.

Animals should receive:

- ☞ Adequate green fodder
- ☞ Good-quality dry fodder
- ☞ Balanced concentrate according to production
- ☞ Clean drinking water
- ☞ Appropriate mineral supplementation

Scientific feeding supports animal health and productivity and is an important part of successful dairy management. Recent ICAR farmer programmes have emphasized the combined importance of scientific feeding, animal health, hygienic milking and clean milk production.

Clean Milk and Mastitis Control Go Together

Mastitis control should be considered an integral part of clean milk production. A practical mastitis-control programme should include:

Clean housing → Clean udder → Proper pre-milking preparation → Hygienic milking → Appropriate post-milking teat

dipping → Early detection → Veterinary treatment

Farmers should not rely on antibiotics alone. Prevention through hygiene and good management is an essential component of udder-health management.

Five Simple Rules for Farmers

Every dairy farmer can remember these five rules:

1. Keep the animal and shed clean.

A dirty environment increases the risk of contamination.

2. Keep the udder and teats hygienic.

Proper teat preparation is central to clean milk production.

3. Keep hands and milking equipment clean.

Milk should never come into contact with contaminated surfaces.

4. Cool milk rapidly after milking.

Reducing the time milk remains warm helps limit bacterial multiplication.

5. Follow veterinary advice on disease treatment and drug withdrawal.

Never mix milk containing prohibited residues with the saleable milk supply.

Clean Milk Means Better Value

Clean milk production is not merely a food-safety requirement. It can also contribute to better dairy-farm economics. Poor-quality milk may have reduced keeping quality and can be rejected or downgraded in organized

milk collection systems. Conversely, consistent hygienic practices help farmers produce milk that meets quality requirements. Therefore, **clean milk production should be viewed as an investment rather than an additional burden.**

A Simple Farm-Level Clean Milk Chain

Farmers can remember the entire process through one simple sequence:

Healthy animal → Clean shed → Clean udder → Clean hands → Clean equipment → Hygienic milking → Rapid cooling → Safe transportation

If every link is properly managed, the risk of milk contamination can be substantially reduced.

Conclusion

Clean milk production begins **before the first drop of milk enters the bucket.**

It begins with a healthy animal, a clean housing environment and proper udder care. It continues with hygienic milking, clean equipment, appropriate handling, rapid cooling and safe transportation. Modern dairy farming therefore requires farmers to think beyond milk quantity. **Milk quality, udder health, animal welfare and food safety are equally important components of profitable and sustainable dairy production.**

The message is simple:

“Healthy animal, hygienic milking and rapid cooling are the foundation of clean, safe and quality milk.”

Scientific dairy management does not always require expensive infrastructure. Many of the most important improvements—clean hands, clean utensils, proper udder preparation, clean housing and timely cooling—can begin with simple daily practices.

Suggested References

1. ICAR. *Kharif Agro-Advisory for Farmers 2025: Livestock and Dairy Management*. Indian Council of Agricultural Research.
2. ICAR–National Institute of Animal Nutrition and Physiology. *Farmer–Scientist Interaction and Scientific Dairy Management Practices*. ICAR, 2025.
3. ICAR–Central Institute for Research on Cattle. *Mechanised Milk Parlour: Hygienic Milking, Udder Health and Milk Quality Management*.
4. *Clean Milk Production*. Source material provided by the user.