

FAQS on
**Good Practices for
Milking Hygiene at
Dairy Farms**

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1 Disclaimer

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2 Introduction to SMEDA

Small and Medium Enterprises Development Authority (SMEDA) is an apex SME development agency working under the Ministry of Industries and Production (MoI&P), Government of Pakistan. In pursuit of its mission, SMEDA has adopted an integrated strategy that comprises SME sectors & clusters development, Business Development Services (BDS), and Policy advocacy to protect and promote SME interests.

SMEDA offers a broad spectrum of business development services to SMEs which include prefeasibility studies, identification of experts and consultants, delivery of need based capacity building programs in addition to business guidance through help desk services.

3 Purpose of the Document

This document is a demonstrative set of information in the form of Frequently Asked Questions (FAQs) for new / start-up entrepreneurs with queries regarding ‘Good Practices for Milking Hygiene at Dairy Farms’, particularly those categorized as Small & Medium Enterprises (SMEs).

The list of FAQs in this document includes information regarding maintenance of milk quality and milking hygiene at dairy farms. For more information about dairy farming, please visit SMEDA website at www.smeda.org.pk.

4 Frequently Asked Questions

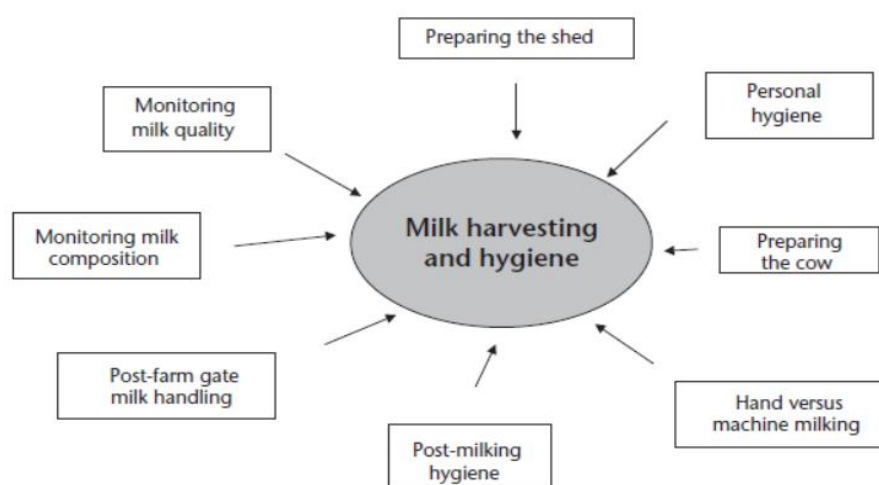
4.1 What are good management practices for ensuring milking hygiene at dairy farms?

Management practices for good milking hygiene make it possible to produce clean and safe milk on dairy farms with the assistance of procedures and equipment as shown in Table 1. These practices ensure production of quality milk that is safe for human consumption. It must be realized that poor milking hygiene leads to spoiled milk which in turn leads to wide

spread food-borne diseases. Hygiene maintenance can be ensured at various steps during the milking process:

- Health and personal hygiene of the farmer
- Environmental hygiene of the farm
- Milking procedures and handling methods
- Post-milking procedures

Consistency in application of standardised milking procedures is an important part of good dairy farming practices. Key factors to be vigilantly followed by farmers to ensure hygienic milk production are highlighted in the following diagram:



The key elements of good milking hygiene



On-farm best practices corresponding with steps of the milking process are as indicated below:

Table 1: On-farm practices for hygienic milk production at dairy farms		
Sr.no.	Key Variables	On-Farm Practices
1	Prepare milking shed	Repair cracks and crevices in floor & clean the floor regularly. Wash periodically with effective disinfectants preferably Calcium Hypochloride in powdered form, also called bleaching powder.
2	Personal hygiene of Farmer	Wear clean clothes, wash hands thoroughly & avoid milking operations in case of sickness. Wear clean apron & gum shoes followed by hand washing protocol. Report to supervisor voluntarily in case of diarrhoea or food poisoning etc.
3	Prepare cattle for milking	Use a clean cloth to clean udder. Also clean other equipment such as buckets, stool, dustbin, milk storage cans etc. on regular basis.
4	Pre-milking cleanliness	Do not use milk containers for any other purpose, all equipment must be clean, covered, sanitised and dried.
5	Cow comfort	Ensure gentle handling of cows/ buffaloes. Offer some concentrate, but not roughage, before milking.
6	Cow cleanliness	Brush cow/ buffalo to remove dust, wash udder and teats and let them dry. Clean brushes once in a week.
7	Cow disinfection	Use one cleaning cloth per cow soaked in hypochlorite: 1 teaspoon in 5 litres of water
8	Reduce disease transfer	Use one cloth per cow; put used udder cloths into separate basket, do not allow milk to drip/ spill on the floor.
9	Water quality	Use only good quality water for washing milking containers and cows/ buffaloes. Water must be free from pathogens and heavy metals like arsenic and lead.
10	Pre-milk each teat	Strip milk each teat into cup to check for mastitis and remove initial milk.
11	Hand milking	Use fast steady speed, use 'hand squeeze' not 'hand strip' technique. Do not use oil, water, milk or spittle as lubricant; you may use hand cream, if necessary.
12	Machine milking	Routinely replace rubber linings, sanitise after use; follow correct maintenance schedule; open tops of milk cans in cooling unit to facilitate heat dissipation. Keep proper record of machine maintenance.
13	Daily schedule of milking	Start milking within 30 seconds of washing udder, a cow's let-down lasts for 5–7 min only.
14	Teat dip	Dip each teat into iodine solution; all teats may be dipped in cup if the solution is still clean.
15	Bulking milk	Quickly strain into milk containers through muslin cloth to remove contaminants; put lid on containers. Muslin should be clean and disinfected.
16	Cooling milk	Take milk to a milk collection centre for cooling as soon as possible; handle containers gently.
17	Post-milking cleanliness	Rinse all milking utensils and brush in cold water; repeat washing with detergent hot water, rinse again in cold water, then rinse in a disinfectant or very hot water. Place all utensils

		upside down, on a rack, to drain.
18	Reusing disinfectant	Do not reuse rinsing disinfectant solution for next milking.
19	Drying of equipment	Leave utensils to drain on racks in a well-ventilated, clean, tidy place.
20	Disease treatment	Use indicator paper, Surf Test or California mastitis test to detect sub-clinical mastitis; treat on same day as detected.
21	Clinical mastitis treatment	Empty inflamed teat out every 2 hours, apply antibiotic on teat and leave it on for 8 hours.

4.2 Where can I find detailed Good Practices for Milking Hygiene?

The international framework to ensure safety and suitability of milk and milk products is contained in the Codex Recommended International Code of Practice General Principles of Food Hygiene (CAC/RCP 1- 1969, Rev. 4, 2003)¹ together with the Codex Code of Hygienic Practice for Milk and Milk Products (CAC/RCP 57-2004)².

4.3 How to maintain health and personal hygiene of milking staff?

Persons suffering from contagious diseases such as, respiratory and intestinal problems are carriers of pathogenic microorganisms which may be harmful to farm cattle. To prevent the spread of such diseases, it must be assured that any person with ill health, working or visiting a dairy farm, avoids handling of farm cattle and milk. Diseases to look out for are:

- Sore throat – cold, flu, fever
- Upset stomach – diarrhea, vomiting, fever
- Skin infection – boils, septic pimples, rashes etc.
- Any other disease that may be transmitted to other persons and cattle

To reduce the likelihood of milk contamination, staff handling milk should be aware of bad or unconscious body habits also. They should avoid the following;

- Scratching any part of the body, face, nose, mouth, ears or hair
- Coughing or sneezing directly onto milk or by-products
- Touching, picking or squeezing pimples, boils or sores
- Using spittle as a lubricant when hand milking (use hand cream if necessary)
- Tasting milk or dairy products by using the fingers or a ladle that is returned to the product.

The key to prevent bacterial contamination of milk is to keep hands clean. Wash hands and forearms by:

- Pre-rinsing with water to remove dirt
- Washing with soap and water
- Brushing under nails
- Rinsing and drying with disposable towels

¹ Recommended International Code of Practice – General Principles of Food Hygiene, CAC/RCP 1 – 1969 available at www.codexalimentarius.net.

² Code of Hygienic Practice for Milk and Milk Products, CAC/RCP 57 – 2004 available at www.codexalimentarius.net.

Smoking should be strictly prohibited at dairy farms while handling milk as it causes coughing, contamination of food by cigarette ash or left over filters and food contamination through dirty fingers.

The use of hair coverings and gloves is recommended to keep hair and skin particles out of milk and to prevent cross contamination. It is better to routinely use disposable gloves and caps at each milking.

4.4 What are the measures to ensure environmental hygiene for milking operations?

Environmental hygiene relates to both internal and external environments. The external environment includes areas outside milk production area, while the internal environment refers to areas where milk is procured, stored or packaged.

- Clean surrounding area of the farm: Farm waste such as manure, mud, water etc. should be effectively disposed of through regular (once or twice per week) removal and spreading into fields.
- Provide sufficient quantity of clean water supply: it should be available for drinking purposes as well as washing of milking utensils and farm cattle.
- Implement effective ways for rodent and insect control: this may be done by a combination of: reduction of food and habitat, vermin proofing, trapping and prudent use of chemical baits and rodenticides. Insects are likely to transmit many diseases to humans; hence, their control means elimination of their breeding and feeding places. Insect-repellent chemicals, infrared lights and sticky pads may be used for this purpose.
- Implement effective measures to control bird invasion: Birds may carry harmful germs, which may contaminate buildings, water supplies and equipment through droppings.
- Regularly groom farm stocks including dairy cattle: Farm animals may be a source of contamination themselves, if not kept clean. Grooming and clipping is important for reducing contamination from their hair and dust. Animals should always be handled quietly and gently to avoid upsetting them as this may result in more dust and manure. Calves, young heifers or other animals (ducks, chickens etc.) should not have access to the milking shed.
- Implement effective biosecurity measures for farm workers and visitors: Contamination may be brought to farm through their clothing, footwear and sickness.
- Implement an effective cleaning program for milking area: Milking area should be a dedicated building for milking operations. Feed, chemicals and medications should not be stored in this area. Roughages should not be fed during milking. Dust and spillage of milk should be minimized. The floor of milking area should be an impervious surface, preferably made of concrete to avoid cracks and crevices. Milking equipment and facilities such as water tubes and drainage racks should be made of non-absorbent and corrosion-resistant materials such as stainless steel.



4.5 What are standard procedures for ensuring hygienic milking operations?

- Milking area should be regularly cleaned after every milking session. Floors should be cleaned and washed regularly.
- All necessary equipment such as teat cloths, buckets, stools, waste bins, teat dip and milk storage equipment should be cleaned. These should be sanitized and dried properly at least 15 minutes prior to use.
- Gentle cow handling and preparation should begin before bringing them to the milking area. Avoid any slapping or striking with hand or sticks as it causes disturbance to them. Consistent hitting may frighten them, which negatively affects 'milk let-down response'.
- Offer some concentrate as treat to animals in milking area at every milking session.
- Implement effective Mastitis Control Program at Farm: Teats should be striped into a strip cup to check for mastitis/abnormalities in the milk for at least a month (and preferably longer) into the lactation period.



Teat cleanliness is an essential part of milking operations. Dirty teats should be washed with clean running water (at low pressure) and then dried with clean, individual towels (paper or cloth).




CALIFORNIA MASTITIS TEST (CMT)

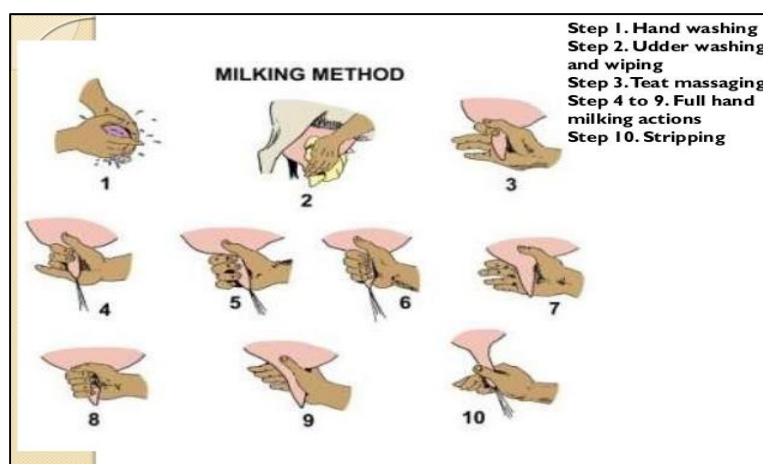
- (CMT) is a rapid, accurate, cow-side test to help determine somatic cell counts (SCC) in a specific cow.
- A small sample of milk (aprox. ½ teaspoon) from each quarter is collected into a plastic paddle that has 4 shallow cups marked A, B, C and D.
- An equal amount of CMT reagent (sodium lauryl sulphate+bromocresol purple) is added to the milk.
- The paddle is rotated to mix the contents.
- In approximately 10 seconds, read the score while continuing to rotate the paddle.
- Because the reaction disappears within 20 seconds, the test must be read quickly.



Gently massage the teat for at least 30 seconds before milking to initiate 'Milk let-down' response. Milking should be complete within 5–7 minutes with hand milking in a quick yet gentle manner through the squeezing action rather than pulling or stripping the teats. Milking staff may use mild hand creams if needed.

- Apply recommended hand milking techniques: Hand squeeze milking method is better than hand strip milking method. The hand squeeze milking method is natural and closely resembles calf sucking.



- Avoid strip-milking technique because it leads to additional bacterial load to milk as udder and teats are wet. Strip milking also leaves the teats moist, loosen the bacteria around the teat skin, bringing it close to teat openings. The absence of teat dipping means there are always bacteria readily available to enter the teat post-milking. Strip milking is more likely to cause epidermal micro erosions that promotes mastitis bacteria.

4.6 What critical points are to be considered during Post-Milking Operations?

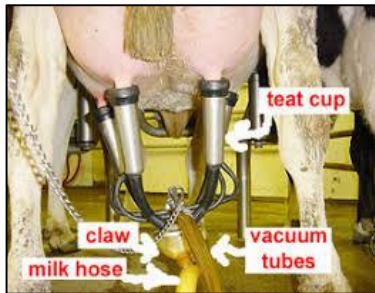
The points to be considered after completion of milking include;

- Milk should be filtered into a clean, sterile storage container immediately after the completion of milking operations. The filter cloth should be thoroughly cleaned in detergent, sanitised and later dried in the sun.
- It is vital to chill the collected milk below 3–4°C in chillers upon completion of milking operations.
- Milk should be transported carefully after the completion of milking and cooling. Heat, light, excessive movement and delayed time cause deterioration of milk quality. Transport containers should be clean, sanitised and sealed with lids. They should be made of food-grade materials, which are capable of being cleaned and sanitised properly.

4.7 How are best practices for machine milking ensured on a dairy farm?

A typical Milking machine has three important components i.e. vacuum pump, regulator and pulsator.

It is advisable to test the operations of a milking machine and equipment for a few minutes before starting milking operations. The machine's pump should be run for 5–10 minutes before the testing process as it allows the pump and machine components to reach full operating efficiency.



While the machines are warming up, a visual inspection is important by checking that;

- Guards over belts and pulleys are in good order.
- Electrical wiring and installation is not worn or cut-out and all devices are fit to operate.
- Vacuum pump oil feed and mounting are satisfactory with little vibration during operation.
- Vacuum regulator is mounted according to manufacturer's recommendations.
- Vacuum gauge is fitted between the regulator and the first pulsator, where the operator can read it easily.
- Rubber ware is in good condition and free from cracks and holes.
- Air admission holes on the claws are not blocked.
- All air filters on regulators and pulsators are clean.

Some basic maintenance requirements to keep a milking machine in sound operating conditions include;

- Regularly lubricate where needed as per manufacturer's recommendations.
- Check drive-belts for cracks.
- All pulleys should be aligned.
- Maintain the pulsators used on bucket milking plant for vacuum as per manufacturer's recommendations.
- Regularly clean air filters, regulators and other working components within machine.
- Regularly check for deterioration and flexibility of rubber ware such as liners and inflation. Inflators are the only part of the machine that comes in contact with teats of the animal. Long milk rubbers should also be replaced regularly (usually every 9–12 months).

4.8 *Why should milk from sick animals be collected in the end?*

As a priority, milk should be collected from animals that are in good health. Milk from animals showing signs of udder disease should not be used for human consumption to avoid any risk of food-borne diseases. Also, milk from animals undergoing any veterinary treatment must not be used for human consumption before the end of the prescribed withdrawal period. Sick animals should be milked in the end, preferably with separate buckets. Their milk should be stored for further examination as directed by your veterinary professional or should be discarded.

4.9 What are the Regulatory & Compliance Requirements for the milking process?

In Punjab, food safety is regulated under the Punjab Food Authority (Amendment) Ordinance, 2015 and Punjab Pure Food Rules, 2011. The Punjab Pure Food rules cover 104 items falling under nine broad categories including Dairy & Dairy Products.

Section 20: Special provision for milk and dairy produce

1: No person shall offer or keep in possession for sale or deliver for sale or supply to any person:

- a) Impure or unwholesome milk or milk drawn from animals affected with any disease of livestock whether contagious, infectious or otherwise capable of causing the milk to become unwholesome;
- b) Milk drawn from animals within thirty days before or ten days after parturition or for butter, curd or cheese-making; and
- c) Milk drawn from animals shall be free from veterinary drug residues like estrogen residue, and others.

Section 21: Restriction on the employment of an ill person

1: No person shall allow any person suffering from communicable disease:

- a) To milk animals
- b) To handle any vessel used for the reception of milk intended for sale
- c) To take part or assist in the business of dairyman, cow or buffalo keeper or vendor of milk
- d) To be employed in a dairy
- e) To be employed in hotels, restaurants, and food business, with respect to offering, exposing prepared food ready for human consumption, preparing for sale or presenting, labeling or wrapping for the purpose of sale

2: Any person engaged in food business as specified in sub-rule (1) shall furnish Health Certificate of his staff including himself, issued by the medical officer of the civil hospital of the respective area in such form as may be prescribed, and shall be renewed annually.

Note: For more information, you may download pre-feasibility studies and sector information through SMEDA website by visiting and registering yourself free of cost at www.smeda.org.pk.