



MILKING PROCEDURE

1. PURPOSE

- 1.1. This Standard Operating Procedure (SOP) instructs farm workers and students on the milking procedures used at the UBC Dairy Education and Research Centre.

2. SCOPE

- 2.1. This SOP will describe the procedures followed to milk the animals at the UBC Dairy. It will also provide a general overview of important points to remember, which impact the welfare of the animal.

3. RESPONSIBILITY

- 3.1. The Operations Manager is responsible for reviewing and updating this procedure as required.
- 3.2. The Operations Manager is responsible for ensuring all personnel are trained in this procedure.
- 3.3. Training will include animal handling, and giving injections (farm workers only). See SOPs on Moving and Chasing Cattle, Handling Cattle, and Giving Injections.

4. DEFINITIONS

- 4.1. **Zoonotic:** any disease that can be transferred between animals and humans, or humans to animals.
- 4.2. **Somatic Cell Count (SCC):** is used as a measure of milk quality. Somatic cells are composed mainly of white blood cells, and a SCC of <100,000 cells/ml indicates a healthy udder and good quality milk. Higher values indicate an infection in the udder, and declining milk quality as the count increases.

5. SAFETY PRECAUTIONS

- 5.1. All personnel entering the milking parlour will wear personal protective equipment –coveralls, rubber aprons and dedicated facility footwear.
- 5.2. Disposable latex gloves must also be worn when working in the milking parlour to protect both the workers and cows from bacteria.

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- 5.3. Be especially careful when attaching the milking cups to the animal's teats as some animals may kick.
- 5.4. Walk carefully in the milking parlour so as not to slip on the wet floor.
- 5.5. Always thoroughly wash your hands with hot soap and water when leaving the milking parlour.

6. GENERAL

- 6.1. The animals are brought up from the pens to the milking parlour in a pre-determined order. See the latest chasing order posted on the communication board in the vet room.
- 6.2. Approximately 250 animals are milked twice daily.
- 6.3. Care should be taken to provide a calm, stress free environment in the milking parlour. This will keep the animals relaxed and provide for optimal milk let down.
- 6.4. The UBC Dairy uses a double 12 parallel milking parlour – 12 animals are lined up on each side for milking, their rears facing the milker who is located in a sunken alley between the two rows.
- 6.5. The cows on opposite sides of the parlour enter at slightly different times to make the milking procedure more efficient. As one side is being milked, the animals on the other side are being prepped for milking.

7. MATERIALS AND EQUIPMENT

- 7.1. Clean paper towels
- 7.2. Teat pre-dip - (antiseptic iodine)
- 7.3. Teat post-dip - (iodine & glycerin)
- 7.4. Disposable latex gloves

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- 7.5. Chasers remove animals from the pen and bring them up to the holding area of the milking parlour. See Moving and Chasing Cattle SOP.

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7.6. In the milking parlour, close the exit gate, and open the entrance gate (Fig 1) to allow 12 cows to walk single file into the chute leading to the milking parlour (Fig 2). As the holding area empties of cows, use the crowd gate to reduce the size of the area and encourage the cows to move forward. As the 12 cows move into the parlour, the sequencing gates will allow them to turn 90⁰, lining them up side by side. Close the entrance gate and use the index gate to gently back the animals up closer to the milking machine. (Fig 3)



Fig 1. Gate controls.

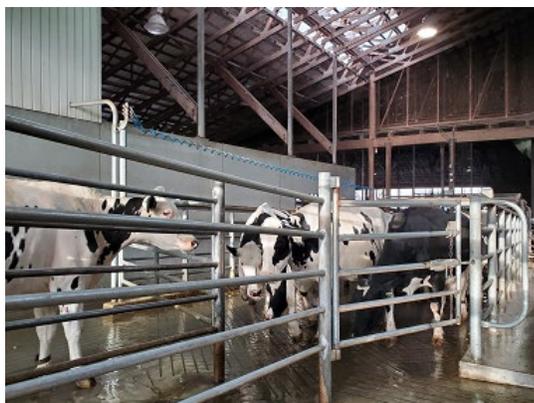


Fig. 2. Animals entering the parlour



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Fig 3. Animals lined up in the milking parlour

7.7. As the cows enter the milking parlour, the computer reads their ankle bracelets and displays their number on the monitor located at each station (Fig 4).

7.7.1. Look for the **alert light** that is displayed for any animal that has a hold on it (being treated with antibiotics, has a high SCC, or have recently calved). The milk from these animals needs to be kept separate from the bulk milk tank.



Fig. 4. Monitor showing cow information.

7.8. Look for the colour of the leg band of any animal displaying an alert on the monitor. Animals with mastitis, high somatic cell counts, or who have recently calved are identified by a red, blue or green leg band respectively. Refer to the list of these animals which is kept in the milking parlour. See SOP on Clinical Mastitis. Update list if needed.

7.8.1. Milk from red (mastitis) and green (fresh) banded cows: pull milk hose from the communal line for these cows. Milk from blue banded (High SCC) cows may be diverted if the SCC is too high, and used for feeding calves.

7.8.2. Milk from fresh cows is diverted for 3 days, and is used to feed the calves. Colostrum from the first milking is diverted and its quality tested.

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See SOP on Colostrum Management. The colostrum is used for the first and 2nd feedings of newly born calves. Milk from the next 5 milkings is known as Transition milk, and is diverted to feed the older calves.

- 7.9. Working in groups of 4 animals, use your hand to wipe the udder and teats clean of dirty material.
- 7.10. Stimulate each quarter of the udder to assist milk let down while assessing the udder for any signs of hardness or redness. Strip (squeeze out 3-4 streams of milk) from each quarter onto the floor. Check for signs of abnormal milk which may indicate that the cow has clinical mastitis. See SOPs on Clinical Mastitis and Collecting Sterile Milk Samples.
- 7.11. Dip each teat of the 4 animals into the sanitizing pre-dip (blue cup). Work from the front to back of the udder, ensuring the dip covers the entire teat (Fig. 5).



Fig 5. Teat properly covered with teat dip.

- 7.12. Using a clean paper towel for each animal, and working from front to back, wipe off the pre-dip of animal 1, paying particular attention to cleaning the teat ends.
- 7.13. Once the teats are completely dry, attach the milking unit to the first animal in line. If she has a red or green leg band divert her milk as described below. If no leg band or alert light, her milk can go into the regular system.
 - 7.13.1. Divert non-saleable milk into a separate milk can. (Fig 6). Take the milking machine hose previously pulled off and attach it to the lid of the milk can. The hose which is part of the lid is then attached to the vacuum.
 - 7.13.2. Measure and record the volume of the diverted milk. Calf barn workers will transport it to the calf barn for pasteurization before it's fed to the calves. See SOP on Milk Pasturization.

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7.13.3. Divert colostrum into a separate milk can. Colostrum is taken to the vet room for quality assessment and storage. See SOP on Colostrum Management.

7.13.4. Milk from High SCC count cows (blue bands) which has too high a count to go into the bulk tank is diverted into a milk can and used to feed older calves.



Fig 6. Milk can for diverted milk

7.14. The milking unit should be silent (no air squawking), and for optimal milk flow, should be attached within 60 seconds from the time the teats were first stimulated. For proper alignment, adjust hoses and units as necessary.

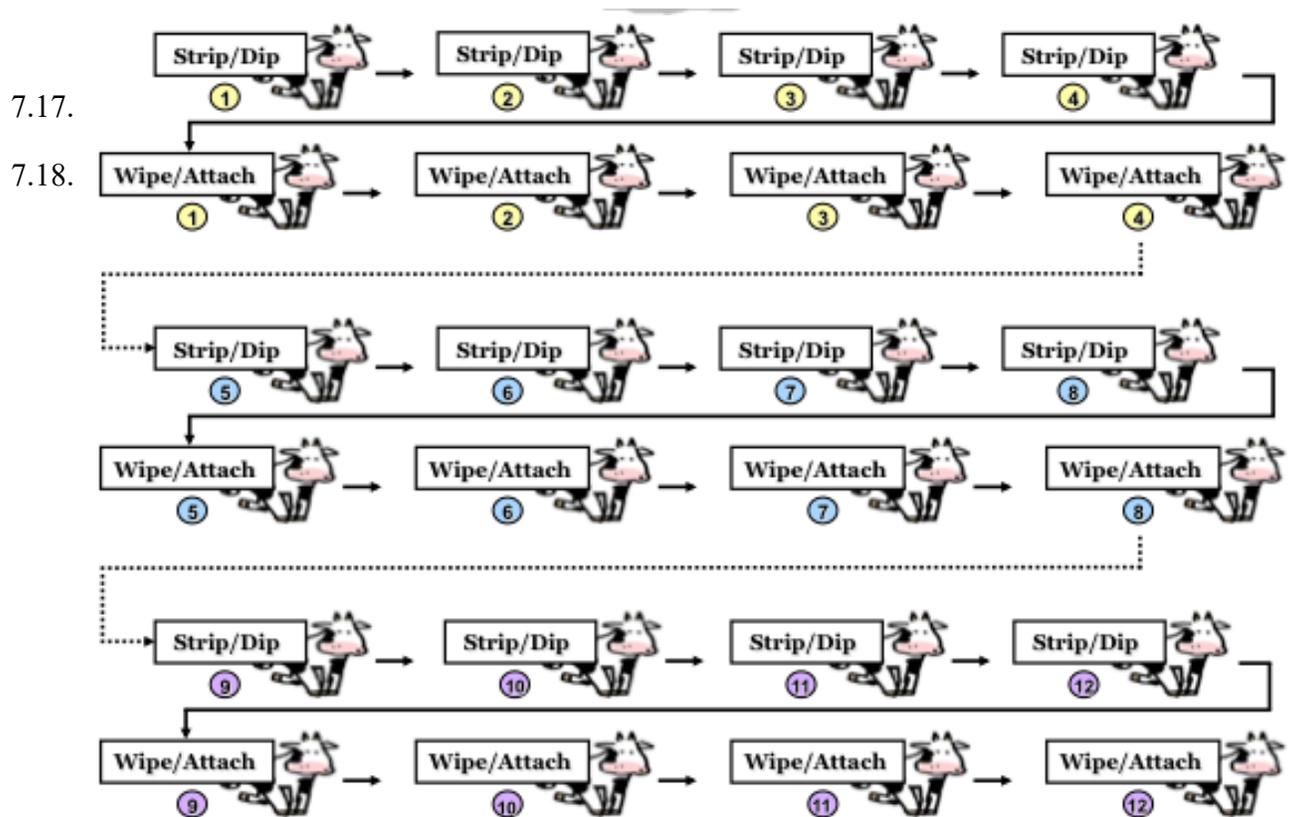
7.15. Repeat steps 7.12 to 7.14 & 7.8 for each of the three remaining animals.

7.16. Repeat steps 7.9-7.15 on animals 5-8, followed by animals 9-12. See Fig 7 for an illustration of this process.



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Fig 7. A diagram explaining the order to follow in the milking parlour:



7.17 Once the milk flow falls below a certain threshold, the vacuum will shut off and the milking units will drop off automatically.

7.18 Dip the teats of each animal with post dip (green cup), ensuring the entire teat is covered.

7.19 When all animals on one side are finished, release them from the station by pressing the exit button. This will lift the exit gate so the cows can leave. The animals will exit the milking parlour through a side lane which runs beside the holding area of the milking parlour, and be returned to their pens by the chaser.

7.20 When the exit gates open, the milking machines are automatically backflushed with an iodine cleaning solution before the next animals come in.

7.21 At the same time, in-floor water valves open and flush the floor where the cows stood. This flush cleans the floor area while also encouraging the cows to keep moving out of the parlour.

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8. REFERENCES

- 8.1. CCAC Guidelines on the Care and Use of Farm Animals in Research, Teaching and Testing. CCAC. 2009.
- 8.2. Code of Practice for the Care and Use of Dairy Cattle. National Farm Animal Care Council. 2009
- 8.3. Delaval. Milk production.com. Milk & Milking. Accessed Oct 2019.
<http://www.milkproduction.com/Library/Topics/Milk--milking/>
- 8.4. National Mastitis Council. Recommended Milk Procedures Fact Sheet.
<https://www.nmconline.org/wp-content/uploads/2016/09/Recommended-Milking-Procedures.pdf> Accessed Nov 2019

9. RELATED SOPS

- 9.1. SOP-General-001 Student Training
- 9.2. SOP-Cow-006 Moving and Chasing Cattle
- 9.3. SOP-Cow-012 Giving IV SC and IM injections.
- 9.4. SOP-Cow-017 Clinical Mastitis

10. APPROVAL AND REVISION HISTORY

Author/Approver		Date	Signature
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Document #	Revision #	Changes	