

SECTION III-1 PREPARING FOR MILKING

1. PREPARING FOR MILKING

There are many key components that are involved in udder preparation, and they can vary depending on the flock's management system. It is important to ensure that each udder preparation step is performed consistently to get the best results. Udder preparation is especially important when trying to control udder infections due to environmental pathogens (see Section II.3.2), as these pathogens are present on the teats prior to milking.

1.1 CLEANING THE UDDER AND TEATS

Cleaning and disinfecting the teats and udder prior to milking is essential to minimize the amount of bacteria present on the teat. This not only helps minimize the chance of these bacteria from entering the bulk tank, and potentially infecting teat cups, but it also minimizes the chance of bacteria entering the teat of the ewe, and causing an udder infection. If single-service udder wipes are used (Fig. 1), they can replace the action of udder washing.

Fig. 1. Cleaning the udder and teats



1.1.1 DISINFECTANTS USED ON UDDERS AND TEATS

Disinfectants used on the udder or teats of a dairy animal must be approved by Health Canada for such use¹. The following products listed in Table III.1 licensed for use in dairy cattle according to label directions.

Table III.1. Udder and teat antiseptics approved for use in dairy cattle in Canada (partial list)

INGREDIENTS		PRODUCTS APPROVED IN CANADA FOR DAIRY COWS
UDDER WASHES / WIPES		
Accelerated Peroxide	Hydrogen	DeLaval Prima™ (DeLaval)
Chlorhexidine		WASHES: Della Prep™ (DeLaval); Dihexamin® Udder Wash (Diversey); Professional Preference Udder Wash (Rafter 8); H-50 Udder Wash (Ostrem) WIPES: Dairy Prep Wipes (Agrisan); Kleen & Dri XL (Boumatic); La Lingette Hypre Towel (Matelvage Sarl); Marathon LC (Liberchem); Septicare (Matelvage Sarl)
Iodine		Della-Wash™ (DeLaval); Divosan (Diversey); Iodaphor Prep Udder Wash (Agrisan); Iodophor II (Ecolab); Iosan (West Pentone)
Lactic Acid, glycerin, alcohol		Lactofam™ (DeLaval)

¹ Guidelines for approval of teat dips is found on the Health Canada website at: http://www.hc-sc.gc.ca/dhp-mps/vet/legislation/guide-ld/teat_guidelines_trayons_directives-eng.php

INGREDIENTS	PRODUCTS APPROVED IN CANADA FOR DAIRY COWS
Linear Dodecyl Benzene Sulfonic Acid	Teat Kleen™ (Ecolab)
Nisin	Wipe Out Dairy Wipes
Quaternary Ammonium	Ultra Prep Udder Wash (Agrisan); Ster-Bac Udder Wash (Ecolab)
TEAT DIPS	
Chlorhexidine	POST-DIP: Dairyman's Defence™ Shield (Agrisan); Della-Blue™ Teat Dip (DeLaval); Dihexamin® Teat Dip (Diversey); H-30 Teat Dip (Ostrem); Ultra Blue Teat Dip (Agrisan)
Glycerin & Sulfonic Acid	POST-DIP: Blu-Gard Teat Dip (Ecolab)
Hydrogen Peroxide	POST-DIP: Oxy-Gard™ Sanitizing Teat Dip
Iodine	PRE- AND POST DIP: Bovitec (Agrisan); Della-Pretech Plus™ (DeLaval); Della-Pro™ (DeLaval); Preodine (Agrisan) POST-DIP: Bovi-Kote 75 (Agrisan); Dairyman's Defence™ Premier (Agrisan); Dairyman's Defence™ Ultra (Agrisan); Della-Soft ACT™ Teat Dip (DeLaval); Duo (Ecolab); I-Deal™ Teat Dip (Ecolab); Dairy Dine Germicidal Teat Dip (Dominion); Iodaphor 110 Teat Dip (Agrisan); Iodaphor 110HV (Agrisan); Iodex (Agrisan); K-24 Germicidal Teat Dip (Ostrem); Mastmin® 50 (Diversey); Teat Guard™ (Ecolab); Tri-Fender™ (DeLaval)
Lactic Acid- activator Sodium Chlorite - base	POST-DIP: 4XLA Antiseptic Pre- & Post-Milking Teat Dip (Activator & Base) (Ecolab); Uddergold® Germicidal Barrier Teat Dip (Activator & Base) (Ecolab)

1.1.2 APPROPRIATE UDDER CLEANING PREPARATIONS

There is a process that should be followed when preparing the udder for milking. The udder and teats should be free of debris before cleaning and sanitizing the udder, as excess dirt and manure can affect the reliability of disinfectant products. When disinfecting the udder and teats, use an approved udder wash at the correct concentration, and a clean paper towel or cloth to wash the udder (Fig. 2). Approved udder wipes are also acceptable. If the water becomes dirty replace it immediately with fresh water and disinfectant. If the cloth becomes soiled, replace it with a clean cloth. Make sure that the udder, hind legs and escutcheon area are shorn to allow for proper washing.

Fig. 2. Udder wash and paper towels



1.1.3 PRE-DIPPING TEATS

Pre-dipping teats is done to reduce the risk of transmission of some environmental bacteria (see Section II.3.2) and so may not be recommended in all flocks. Only teat dips approved for use as a pre-dip should be used (see Table III-1). It is very important that if used, directions should be followed to prevent iodine residues in the milk – a human health hazard. For the procedure used for proper teat dipping, see Section III.7 below.

1.2 DRYING THE UDDER

Drying the udder, and especially the teat ends, is a key component in the udder prep procedures. It is important to maintain proper milking procedures, as this step in udder prep can have an effect on the udder of the ewe, and the milk that travels to the tank.

1.2.1 MATERIALS

There are two options that can be used for drying, or simultaneous sanitizing and drying (i.e. wiping); either using disposable towels or wipes, or washable cloths. Disposable towels have their benefits, as the use of these towels minimizes the chance of bacterial transfer from multiple uses, and they are easily disposed. The most common disposable towels are packages of brown paper towels, which are strong enough to withstand the pre-dip liquid while wiping, however, there are more inexpensive options, such as newspaper cut into squares. Regardless of what is used, the towels should be clean and each one used only once on one ewe, i.e. single service.

Fig. 3. Clean laundered udder clothes



Commercially available udder wipes, which are impregnated with a chlorhexidine sanitizer, may replace udder washing and drying but not pre-dipping. Again, the wipe should be approved for use in dairy animals (see Table III.1) and be single-service. Wipe teat ends and teats first, followed by the udder. Discard when done.

A common material for drying the teats is reusable and washable cloths. This is an economical choice for producers, as the cloths are a one time investment, however, they do have to be washed thoroughly after each milking (Fig. 3). It is important to ensure that reusable towels are being washed and disinfected properly to minimize the chance of bacterial transfer between ewes.

When washing the towels, it is imperative that of the three following requirements, at least two are being met to kill all bacteria present on the cloths:

- Hot water, at least 70°C, for washing
- High temperature for drying
- The addition of bleach at washing

Another component to consider if washing towels in the barn is the quality of the water, including hardness. If poor or unknown a high quality detergent is required to properly wash the towels. In addition, towels should be dried properly, as wet environments promote the growth of bacteria.

1.2.2 PROCEDURE

When wiping the udder, it is important to make sure that the cloth is fully open to get the maximum coverage when wiping the teat. The towel should be completely wrapped around the teat, and should be pulled downwards in the natural direction of the teat. It is imperative that all teat dip is removed from the teat, with particular attention paid to the teat end, before the milking unit is attached.

1.2.3 MILK LET-DOWN

Milk let-down is the process by which the maximum udder pressure is obtained in the udder after a release of oxytocin, which allows for optimal milk production at each milking. Milk let-down in sheep is relatively short, so it is essential that udder prepping is done quickly, but efficiently. Milk-out time is also quite short, approximately 1.5 to 3 min, so it is also essential that udders are not over-milked, surpassing the natural milk let-down.

Milk let-down is stimulated during the udder preparation steps, which is why these steps are not only important for udder hygiene, but also to stimulate maximum milk let-down and reduce the need for long milking times and damage to the teat ends. Wiping is especially essential for this process. The pulsation from milking equipment also has the ability to stimulate milk let-down; however, if given the option, milk let-down should occur prior to milking.

1.2.4 RISKS FROM NOT DRYING PROPERLY

It is essential to ensure that the udder and teats are dried thoroughly before attaching the milking unit, for a variety of reasons. First, wiping the teats to dry them ensures that all debris is removed from the teat, to minimize potential transfer of bacteria into the milk, or being exposed to the teat end. Second, if producers use an udder wash for prepping the teats, there is a potential for this liquid to slide down the teat end, bringing pathogens, particularly environmental pathogens, with it into the teat end, or milk. This may also cause an increase in the bacterial counts in the milk and elevated standard plate counts. Finally, if teats are not wiped properly, and an iodine-based teat disinfectant is used, there is a potential for increased iodine concentration in the milk, which can have human health implications.

1.3 STRIPPING FORE-MILK INTO STRIP CUP

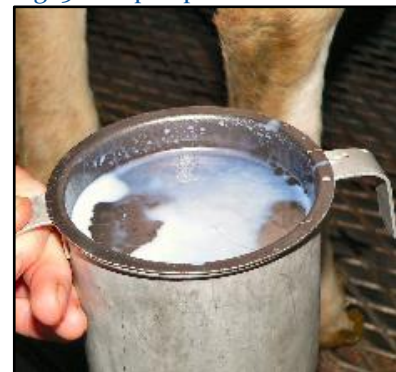
There are two main reasons that the foremilk of ewes should be stripped prior to milking. The first is to promote milk let down. The second is to look at the consistency and colour of the milk, to determine if there is a clinical infection in either quarter (Fig. 5). After the ewe is cleaned and the teats are wiped dry, the milker can manually strip the teat in a downward motion, with the milk being squirted into a strip cup. There are different kinds but all allow visual inspection of the milk. One type has a filter that allows normal liquid milk to pass through the filter into the cup, while the mastitic milk is caught in the filter. Another has a black surface that, when the milk runs across it, will show up clots and changes in colour. If any abnormalities are seen, a follow-up test can be performed on the milk to determine if mastitis is likely present (see Section II.5.2).

Although this technique takes slightly longer, and increases overall milking time, it allows the milker to detect cases of mastitis in the ewes more quickly, which significantly improves udder health in a flock.

Fig. 4. Wet and woolly udder is risky to milk quality!



Fig. 5. Strip cup



1.4 HYGIENE OF HANDS

As the hands are in direct contact to teat ends, it is very important to make sure they remain clean during the milking process. As previously discussed in Section II 4.9.2, hands can be a risk factor for contagious mastitis. Disinfecting hands before milking is a common practice to minimize the transfer of bacteria, however, using gloves are the ideal choice when milking ewes, particularly when hand milking. The use of gloves decreases the chance of bacteria often present in small cracks on the skin or under the fingernails being transferred to the ewe's teat end. Although it is important to disinfect hands or don gloves prior to milking, it is important to maintain this good hygiene throughout the period of milking, and consistent hand or glove cleaning, or even the changing of gloves can be required.

Fig. 6. Wash and dry hands frequently



1.4.1 STAPHYLOCOCCUS AUREUS HUMAN CARRIERS

Humans can be potential carriers of pathogens, particularly methicillin-resistant *Staphylococcus aureus* (MRSA) or other methicillin-resistant coagulase-negative staphylococci bacteria. In addition to *Staph. aureus*, it has also been shown that the coagulase-negative staphylococci species, *Staphylococcus epidermidis*, can be transmitted from the skin of humans to the mammary gland of ewes. These two organisms are two of the most important pathogens in mastitis of sheep and so care must be taken to prevent transmission of these bacteria from the milking staff to the animals.

Fig. 7. Hand washing facilities

