

National Mastitis Council

Recommended Milking Procedures

Proper milking procedures, attention to detail, and a clean environment are required to minimize mastitis and maximize production of quality milk. Milking should be done by people who are responsible, trained, conscientious, and have a clear vision that they are harvesting food for human consumption. Research and experience indicate repeated regular training of milking technicians, whether family or non-family workers, is a very important part of this process.

Provide a Low Stress Environment for Cows

A consistent operating routine is essential to animal well-being, teat health, physiology of cows to produce and let-down milk, and for healthy milk harvest by the milking machine. Because of these cow, technician, and machine factors, consistent milking routine is also an essential component for mastitis prevention.

Cows that are frightened or excited before milking will release hormones that suppress the normal milk let-down response. Many events can lead to frightened cows and thereby affect milk harvest. Cow excitement may be caused by factors such as order of cow entry into milking parlor (e.g. first or last stall), unusual sounds, unaccustomed people in the milking environment, pain associated with improper milking machine function, pain associated with acute mastitis, non-routine udder preparation or milking process, and initial experiences of being milked (e.g. first-calf heifer). Erratic, rushed, or forced movement of cows may also affect let-down response. Blatant harsh treatment of cows happens infrequently but is also a factor that can contribute to poor let-down. Factors that excite cows and occur within 30-minutes of milking appear to affect normal milk let-down in spite of an effective preparation routine. Extent of the impact will likely depend on the trigger event and cow response to that event.

In summary, hormones released into the bloodstream when cows are frightened may interfere with normal milk let-down. Prolonged or reduced milk let-down will increase machine-on time and may affect teat health. A milking environment that chronically stresses cows may predispose cows to a greater risk of mastitis. A routine and calm milking environment is essential to proper milking procedure.

Check Foremilk and Udder for Mastitis

The process of gently but firmly removing three to four streams of milk from each teat before milking is known as 'stripping'. Careful stripping of milk during the preparation procedure is very important to mastitis control and quality milk harvest. Stripping is the primary method for detecting mild and moderate cases of mastitis and assists in milk let-down. Cows and quarters with mastitic milk should be identified when stripping milk. This should be done by palpating the udder and teats for hardness or swelling, by visually checking for redness of the udder and for abnormal milk in the strippings. Abnormal milk may appear red-tinged, or, have clumps, strings, or flakes of sloughed cells. In tie-stalls it is important to always use a strip cup or plate to collect strippings. Once evaluated for abnormal milk, the strippings should be emptied into the gutter to reduce bacterial contamination of cow beds.

Strip cups should be cleaned and sanitized after each milking. Use of unclean strip cups may spread bacteria leading to mastitis. In parlors, milk may be stripped directly onto the floor. However, care should be taken to reduce splash back onto cow teats and udder. Use of black tile flooring will increase ability to see mastitis, while presence of a gutter directly under cow udders will reduce ease of detecting abnormal milk. Milk should never be stripped onto the hand or gloved hand because this will substantially increase the risk of spread of bacteria to uninfected quarters and cows and thereby increasing the risk of mastitis.

Wash Teats with an Udder Wash Solution or Predip Teats in an Effective Disinfectant Product

When applying disinfectant solutions to clean teats it is important to cover only the teats and not the complete udder. Disinfectant and/or water dripping from udders will increase risk of bacteria being

transferred to teats and teat ends and will increase drying time. Use of excess water when prepping cows is also associated with elevated bacteria counts in bulk tank milk.

If a sprinkler pen is used to pre-wash cows, it is important to ensure all sprinkler heads are working and properly adjusted. Sprinkler on-time should be adjusted for the quantity of dirt and manure to be removed from the cows' udders. Sufficient drying time is needed to ensure udders are dry prior to parlor entry. Once cows are in the parlor, single-use or individual towels should be used to finish drying the udder and teats. For the occasional cow that requires additional washing, disinfectant hose or pre-dip may be used to remove excess soil with a second application to kill remaining bacteria.

Producers with parlors or stanchion barns may use pre-dipping instead of washing when preparing cows for milking. Predipping works best when teats are clean. The teat should be completely covered with disinfectant. Predip should remain in contact with the teat for 30 seconds for sufficient kill-time and should then be thoroughly wiped off of the teat sides and teat end before attaching the milking unit. Dippers should be cleaned after each milking.

Dry Teats Completely with an Individual Towel

Regardless of how the teats are prepared they must be dried thoroughly with single-service paper or individual cloth towels. Thorough drying of teats and teat ends is a critical step in the prep procedure. Milking wet teats increases the likelihood of mastitis and reduces milk quality. Single service cloth towels can work as well as paper towels. While paper towels are disposed of following single cow use, cloth towels must be washed, sanitized, and dried in automatic machines before reuse. Attention to fill capacity of washer, water temperature, and thorough drying are important to ensuring towels are free of bacteria. Milking technician's gloved hands should be washed and disinfected frequently during milking to reduce contamination of clean towels before use. In addition, clean towel containers (paper towel dispenser, apron, or basket) should be cleaned after each milking to reduce bacterial contamination before next use.

Attach Milking Unit within 120 Seconds after Initiation of Stimulation

The milking machine should be attached within 60 to 120 seconds from start of cow prep to coincide with hormonal release and milk let-down. Timing of unit attachment and consistency of lag-time are critical to milk let-down, optimization of milk volume harvested, and teat health. Unit attachment should be done carefully to avoid excessive air from entering the milking system as teat cups are attached to teats. Milk let-down causes maximum udder pressure approximately 60-seconds after first stimulation and lasts about ten minutes. Therefore, attaching machines within 120 seconds after first stimulation makes maximum use of the let-down effect. If cow preparation leads to good let-downs, most cows will milk out in four to eight minutes.

Adjust Units as Necessary for Proper Alignment

Milking units should be aligned immediately following attachment to be approximately parallel to cow udder and with the goal of minimizing liner slips or squawks. If teat cups are seated excessively high on teats, irritation of the teat may result. Improperly aligned units may also block milk flow and increase the amount of milk remaining in the udder at the end of milking. In some cases, units may require realignment toward the end of milking.

Immediate attention to slipping or squawking teat cups is very important. The majority of new mastitis infections caused by liner slips occur near the end of cow milking. At this time, when the teat cup liner slips and another liner opens, small droplets of milk may be propelled back against the end of the other teat. These droplets may contain mastitis-causing organisms which in some instances may enter the udder. Since milk flow near the end of milking is minimal, chances of the organisms being flushed out of the quarter are reduced and therefore risk of new infection is highest.

Shut Off Vacuum before Removing Unit

The unit should be removed when the last quarter milks out. In parlors equipped with automatic detachers care should be taken to ensure that they are properly adjusted to remove the unit promptly. The risk of liner slip and possible new infection is greatest during overmilking. The method of removing teat cups is usually more important than the time of removal. The vacuum should always be shut off before teat cups are removed. The practice of pulling the unit off under vacuum should be avoided as it may result in liner slip and new infection in another quarter. A question often asked is "how should a quarter that milks out ahead of others be handled"? In general, if the teat cup will stay on a teat without slips, it should be left on. Removing the teat cup simulates liner slip and may result in a new infection. Incorrect removal of units constitutes a very significant threat to udder health.

Dip Teats Immediately After Unit Removal with an Effective Disinfectant Product

The entire teat must be covered in a commercial teat disinfectant product immediately after milking. A good teat dip destroys organisms on teats, prevents teat canal colonization of organisms, and eliminates existing teat canal infections. A variety of teat dip products are available. Many commercially available products are known to reduce the rate of new infections by more than 50 percent. Research that demonstrates a teat dip product's effectiveness for primary herd pathogens should be available through the manufacturer.

Teat dip cups should be maintained in a clean and sanitary manner. It is important to never pour the remaining dip back into the original container. When the dip becomes cloudy or contaminated with bedding or manure, the remaining dip should be discarded. Dip cups should be thoroughly cleaned and fresh dip refilled before milking.

Post-milking teat disinfection should be maintained during cold weather. When a conventional dip is used and the temperature is below 10F (-12C) or there is a strong wind chill factor, the teat dip should remain in contact with the teat for at least 30 seconds. Excess teat dip should then be removed with a single service paper or individual cloth towel. There are also winter formulations specifically designed to promote teat health and protect teat skin from freezing during cold weather.

Teat spraying or foaming are alternatives to teat dipping. Results should be acceptable if done correctly, with a suitable and well maintained device that provides adequate disinfectant coverage of each teat. On many dairies, coverage of teats by a sprayer is often incomplete. Attention should be paid to complete coverage of all teats with the disinfectant. It is important to keep teat sprayers or foamers clean while milking. The teat antiseptic application device should be kept off the floor and away from manure splash while milking.

Importance of Hygiene

Periodic hair removal from udders reduces the amount of dirt and manure that may adhere to the udder and contaminate milk. In addition, cows with long hair on udders will require more time to properly clean and dry teats. It is recommended that udder hair be removed every 3 months. In addition, udder hair should be removed from fresh cows and heifers as soon as possible after calving. Attention to teat and teat end cleanliness during the prep procedure is critical to reducing and maintaining a low new infection rate. The cow milking platform, whether in a tie-stall or parlor facility should be kept clean during milking. Again, attention should be paid to minimizing water splash onto cow udders and milking equipment while maintaining clean equipment and stall surface. Use of hoses should be limited while cows are in the parlor.

Grouping and Segregation

Other management factors can add significantly to the benefit of good milking procedures. The order in which cows are milked can have an impact on controlling the spread of mastitis. By milking first lactation cows first, second and later lactation cows with low somatic cell counts second, cows with high somatic cell counts third, and cows with clinical mastitis last, the chance of spreading mastitis organisms from cow-to-cow is reduced. Use of milking gloves and periodic disinfection or changing to clean gloves is also

very important to reducing rate of new infection.

Good management dictates that the person milking must be constantly alert to conditions that may spread mastitis organisms from cow to cow. Correcting such conditions assists in the production of high quality milk from healthy udders.

*National Mastitis Council
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