



Recommended Mastitis Control Program

This document outlines general principles for mastitis control and provides a structured approach for on-farm assessments. While it applies to various production systems, regulations and practices vary among countries and regions, and practices not mentioned here may be applicable to specific herds.

1. Establish herd-specific udder health goals, monitor and assess outcomes using data-driven methods

- Set realistic targets and monitor data over time for incidence of both clinical and subclinical mastitis.
- Monitor quality parameter of saleable milk. Consider surveillance monitoring of comingled milk for contagious pathogens, such as *Staphylococcus aureus*, *Streptococcus agalactiae*, *Prototheca* spp. and *Mycoplasma* spp. Be aware that somatic cell count (SCC) values and bacteriological results in herds that ship multiple loads per day do not represent the entire herd.
- Enroll in a cow-level SCC measuring program or use another method, such as California Mastitis Test (CMT) or inline system, to regularly monitor and record cases of subclinical mastitis.
- Determine mastitis-causing pathogen in clinical cases, high SCC cows, fresh cows and heifers, using bacteriology or polymerase chain reaction (PCR).
- Monitor teat end health and teat skin condition according to NMC guidelines.
- Establish a consistent recording system for clinical mastitis to include cow identification, date detected, quarter(s) affected, mastitis severity (mild, moderate, or severe), treatments protocols, milk and meat withholding period, and the causative bacterial pathogen.
- Use mastitis records to calculate the incidence of clinical mastitis and the incidence and prevalence and subclinical mastitis, and to evaluate segregation, treatment and culling decisions.
- Regularly review goals with the farm advisory team, including the veterinarian, producer, herd manager, milking personnel and advisors. Identify risk factors and prioritize management changes and employee training to prevent new intramammary infections (IMI), optimize antimicrobial use and minimize the number of cows in the hospital pen.

2. Manage the cow's environment

- Maintain clean, dry and comfortable lying areas, and keep cow traffic areas clean and dry.
- For **confinement dairy systems**, ensure proper stall use by confirming adequacy of stall size, design and stocking density; maintain clean, dry and comfortable stalls and yards through appropriate bedding management; and ensure proper ventilation.
- For **loose housing**, provide adequate space.
- For **dry lot or pasture-based dairy systems**, keep pads, lying areas and standoff areas clean and uncontaminated, and prevent cows from accessing drainage areas or natural water sources, such as streams or ponds.
- For **compost-bedded pack barns**, add new bedding, as a source of essential carbon, when the pack starts looking moist, stir/till two to three times daily, and ensure animals do not have direct access to water or feed sources from the pack.
- For **all dairy systems**, mitigate environmental stressors, including heat stress, frostbite and stray voltage.
- Consider use of Gram-negative core antigen vaccines to reduce severity of coliform mastitis.

3. Establish and monitor proper milking procedures

- Maintain a low stress milking environment for cows and milking personnel.
- Wear clean disposable gloves and appropriate personal protective equipment (PPE) (such as safety glasses) during milking to limit spread of pathogens and to protect milking personnel.
- Examine foremilk to facilitate early detection of mild and moderate clinical mastitis, and ensure proper milk letdown.
- Ensure teats are clean and dry before milking.
- If local regulations allow, apply pre-milking teat disinfectant that completely covers teat skin and allow it to remain on teats for the manufacture-recommended contact period.
- Dry teats completely to avoid presence of teat disinfectant residue, using a properly sanitized cloth towel for use on one cow or a single-service paper towel.
- Attach teat cups squarely and level with the udder 60 to 180 seconds after sufficient stimulation.
- Adjust and align cluster during milking to prevent liner slips and squawks.
- Set automatic unit detachment settings appropriately to prevent over or under milking. With manual removal, avoid machine stripping and shut off vacuum to the claw before removing cluster.
- Apply teat disinfectant immediately following teat cup removal and ensure complete coverage of teats, regardless of application type.
- Select teat disinfectants based on documented efficacy and appropriate regulatory approval data.
- Milk treated cows and cows confirmed to have intramammary infections caused by contagious pathogens last.

- Ensure that cows remain standing after milking by providing fresh feed and water to allow time for closure of the teat canal.
- For **automated milking systems (AMS)**, monitor pre and post milking disinfection, proper and timely cluster attachment, and self cleaning between cows. Perform routine visual inspection of equipment for buildup on spray nozzles and other surfaces.

4. Proper maintenance and use of milking equipment

- Install and update equipment according to appropriate standards.
- Service, maintain and regularly evaluate equipment function according to manufacturer guidelines, using dynamic evaluation methods and appropriate testing procedures.
- Replace liners, milk hoses, short milk tubes and any other rubber or plastic parts according to manufacturer service intervals. Track the number of milkings between replacement to facilitate timely replacement. Replace any broken parts that occur between maintenance interval immediately.
- Thoroughly wash and sanitize equipment after each milking. Work with a dairy equipment service provider on a wash analysis to ensure correct water temperature, chemical and detergent levels, and wash cycle.
- Maintain all wash hoses so they do not become colonized with bacteria. Run low-level disinfectant (chlorine or iodine) through hoses and/or replace as needed.
- In AMS herds, ensure proper maintenance is routinely performed on the robots following manufacturer recommendations.

5. Appropriate management of cases of clinical mastitis during lactation

Clinical mastitis can be classified as **mild** characterized by changes in the milk (clots, flakes or changes in color and consistency), **moderate** characterized by changes in the milk along with visible udder inflammation (redness, heat, pain and swelling), or **severe**, which includes changes in the milk, inflammation of the udder, and evidence of systemic illness in the cow (fever, lethargy, inappetence and depression).

In AMS systems, mastitis can be detected in various ways (electrical conductivity, light emission through milk, etc.). Ensure prompt attention is given to cows with alerts indicating suspicion of mastitis.

- Develop and implement a herd-level clinical mastitis treatment protocol with the veterinarian who has a veterinary-client-patient relationship and considering the economic ramifications of therapy decisions.
- Aseptically collect a pre-treatment milk sample for microbiological culture, when applicable, to determine the etiology of clinical cases and base treatment decisions on etiology in combination with cow-specific factors that influence a successful outcome.
- Follow farm-specific treatment protocols using approved therapies appropriate for case severity and causative pathogen(s). Use medicines/drugs according to national regulations, following the manufacturer label or as prescribed by the herd veterinarian.
- Minimize the use of extra-label treatments. If necessary, follow regulatory guidelines under the supervision of a licensed veterinarian.

- Narrow spectrum intramammary treatments are preferred over broader spectrum. Where applicable, review the use of non-steroidal anti-inflammatory drugs (NSAID) in treatment protocols.
- Consider culling, rather than treating, cows with non-responsive chronic infections.
- When infusing intramammary products, disinfect the teat with a germicide, scrub the teat end with an alcohol-soaked swab before infusion, and use the partial insertion technique. Clearly identify treated cows and record all treatments permanently in the dairy record system.
- Observe the specified milk withdrawal period for products used.
- Always follow recommended drug storage guidelines and observe expiration dates.

6. Effective dry cow management

- Manage milk production at dry-off. Recommended milk production should be ≤ 15 kg/day (≤ 33 pounds/day). Strategies for reducing milk production before dry-off include decreasing the ration's energy density, reducing total energy intake to maintenance and/or decreasing milking frequency.
- Gram-negative core antigen vaccines may be administered during the dry period to help mitigate clinical mastitis in early lactation.
- If using intramammary products, use non-expired, single-dose applicators, following manufacturer labels and guidelines for withdrawal periods. Disinfect teats and scrub teat ends with an alcohol-soaked swab(s) before infusing with intramammary antimicrobials and/or internal teat sealants. When using both an antimicrobial and an internal teat sealant, the antimicrobial should be infused first. Use the partial insertion method of dry treatment infusion. Physically identify dry cows to prevent accidental milking (e.g., using colored leg bands) and keep records of all treatments, including meat and milk withhold times, and batch numbers of medicines.
- In herds with a high prevalence of contagious pathogens, blanket treatment (treating all quarters of all cows) is an option in some countries. However, antimicrobial use policies vary globally; some countries prohibit this practice and may require pathogen confirmation or SCC testing before use.
- Identify cows or quarters with existing intramammary infections or those at high risk during the dry period. When appropriate, treat affected cows or quarters with an approved dry cow antimicrobial and/or teat sealant. In well-managed herds with good hygiene and reliable SCC or culture/PCR data, a selective approach is recommended – using antimicrobials only for infected cows and an internal sealant alone for uninfected cows.
- In situations of high environmental pathogen exposure, use an internal or external teat sealant for dry cows. Internal sealants can be applied once at dry-off, whereas external sealants only tend to last a few days and require reapplication.
- During the dry-cow period, provide adequate dry cow nutrition to enhance immune system and support late gestation metabolic function, visually inspect udders regularly for mastitis detection in the dry pen, and manage the cow's environment to minimize exposure to pathogens. Remove excess udder hair before calving.

7. Maintain herd biosecurity

- Consider maintaining a closed herd.
- Prior to purchase of cattle, request bulk tank and individual cow SCC data and obtain aseptically collected milk samples for bacteriological culture from cows. For suspect animals, further diagnostic efforts may be warranted to identify cases of subclinical mastitis prior to purchasing cows.
- Isolate recently purchased cows and milk separately, until there is assurance of the absence of intramammary infection.
- Segregate or cull cows with persistent high SCC (>200,000 cells/ml) or linear score ≥ 4.0 . If the cause is unknown, conduct a milk culture. Treat chronic infections during dry-off and cull those still culture-positive at calving. Cull or permanently segregate cows infected with *Staphylococcus aureus*, *Mycoplasma* spp., *Nocardia* spp., *Prototheca bovis*, certain *Pseudomonas* spp. or *Trueperella pyogenes*.
- Consider udder health status of first-calf heifers as they can introduce new pathogens and impact herd biosecurity. Consider use of internal teat sealants pre-calving in first-calf heifers if economically beneficial and if application can be performed safely and hygienically.

Published August 18, 2025

Reviewed 2025

Revision due 2030

Additional Resources

1. Establish herd-specific udder health goals, monitor and assess outcomes using data-driven methods

For organic farms review the specific recommendations here: [link](#).

<https://www.nmconline.org/wp-content/uploads/2019/02/final-mastitis-control-on-organic-dairies-in-the-us-for-nmc-posted-Feb.-2019.pdf>

[The Value and Use of DHI SCC](#)

[Using Bulk Tank Milk Cultures in Dairy Practice](#)

[Teat Condition Portfolio](#)

[The Use of PCR to Diagnose the Cause of Intramammary Infections in Dairy Cattle](#)

2. Manage the cow's environment

[A Practical Look at Environmental Mastitis](#)

[Compost Bedded Pack Barn Design](#)

3. Establish and monitor proper milking procedures

[Recommended Milking Procedures](#)

[Post-milking Teat Disinfection Fact Sheet](#)

[A Practical Look at Contagious Mastitis](#)

4. Proper maintenance and use of milking equipment

[Procedures for Evaluating Vacuum Levels and Airflow in Milking Systems \(rev. 2012\)](#)

5. Appropriate management of cases of clinical mastitis during lactation

[Guidelines on Normal and Abnormal Raw Milk Based on SCC and Signs of Clinical Mastitis](#)

[Interpreting Bacteriological Culture Results to Diagnose Bovine Intramammary Infection](#)

[Milk Bacteriological Analysis Using MALDI-TOF Technology](#)

[The Use of PCR to Diagnose the Cause of Intramammary Infections in Dairy Cattle](#)

[Laboratory Handbook on Bovine Mastitis](#)

[Current Concepts of Bovine Mastitis](#)

6. Effective dry cow management

[Dry Cow Therapy](#)

7. Maintain herd biosecurity

[Heifer Mastitis Prevention and Control](#)