

Guide to Crisis Management of Somatic Cell Counts in Cattle

Vermont Agency of Agriculture, Food and
Markets

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Introduction

Somatic cell count (SCC) is commonly referred to as a Leucocyte count. The SCC is predominantly composed of white blood cells and is considered a good indicator of udder health in a herd. A cow with an SCC over 300,000 cells per ml. will generally have a bacterial infection associated with the elevation. These infections are called mastitis. Mastitis has a number of causes, but can generally be prevented. You should be able to keep your number of new cows treated per month to less than 1% of your milking herd. Some types of mastitis cause an elevation in SCC, but may not show during fore-stripping or on the strainer. This is called sub-clinical mastitis. This guideline attempts to point out the major areas of mastitis prevention.

Regulations

The legal limit for SCC in grade "A" milk is 750,000 cells per ml. for cows. At least once per month the milk from each producer is sampled for quality evaluation. When producers are in violation 2 out of your last 4 tests they are sent a letter by the Dairy Section of the Vermont Department of Agriculture, Food and Markets. This letter is a warning that if the next count exceeds the limit the milk will be excluded from the market and the producer will not be allowed to ship milk again until the problem causing the high count has been solved, and the count is below the legal limit. After an exclusion there is a temporary reinstatement followed by accelerated sampling period where 4 samples will be taken in a 21 day period with no more than one per day or two in any week. If any of these are high you are again going to be excluded until the count is consistently below the limit.

Steps to prevent

Prevention is the key to mastitis control. Treating your way out of a mastitis problem is a temporary solution and measures need to be taken to make sure new cases are minimized or you will be back in trouble soon. **You need to identify what is causing the mastitis problem.** If possible think back to when the high SCC or clinical mastitis started and identify changes that occurred at about that time. Below are the steps that need to be followed to minimize new cases of mastitis and develop a program to deal with the mastitis you have and prevent future problems.

Milking Procedures

Proper milking procedures are essential to minimizing the risk of a bacterial infection causing mastitis. Attached to this guideline is a two page sheet outlining a good milking procedure. It also explains why the procedures are done in that order. Feel free to copy these pages and post them in your milking area. The goal is to milk clean, dry, sanitized teats. Be sure that you examine the teat ends as well as the sides of the teats after they have been prepped to determine that the ends are clean. Make sure the teat dip you are using is effective as shown by protocols consistent with those recommended by the National Mastitis Council. Your route supplier should be able to show you the study where the dip was tested, usually performed by a University. Eliminating “unknowns” is important when you are having problems, dips that have not been tested against these protocols may be effective dips, but without the independent verification the protocols provide, they are an added risk.

Housing

Clean, dry, well nourished, comfortable dairy animals are less likely to develop problems from mastitis and many other disease problems as well. Bacteria need moisture, warmth, and nutrients to multiply and, while all of these are present in a dairy barn, measures can be taken to minimize them. Some bacteria will double every 20 minutes under the right conditions. Have the nutritive value of your forages analyzed and get a nutritionist to review the nutritional adequacy of your cow's dry and lactating rations, including micronutrients such as vitamin E, selenium, zinc, and copper. Dry matter calculations should be done on feed at a variety of times through the season to make sure the proper amounts are being fed. Udders should be clipped to minimize hair that may interfere with the sanitizing and milking processes. Animals in pastures should be fenced out of muddy areas and areas where the concentration of mud and manure will have the potential of contaminating the udders.

Cows should be well bedded with stalls maintained several times a day, or more in a tie stall barn. Stalls need to be properly sized and designed so that a cow can easily lie down and get up. Alleys should be scraped at least twice a day to prevent the build-up of manure that may splatter onto the udder.

Milking System

Your milking system harvests the crop paying your livelihood two or more times every day. It is essential that it is in good working order. The system needs to provide stable vacuum, adequate pulsation, and gentle milking action. Have your milking machine dealer test your system every 1,200 hours of operation, or annually, whichever is shorter.

Claws should have adequate capacity for efficient throughput of the milk or designed to not need capacity (quarter milkers, etc.). If clawless milking is used, the milk hose from the inflation to the milk fork should be at least 3 feet long, or provide special pulsation, like a periodic air inlet.

Milking systems for cows need to maintain a claw vacuum of 10.5 to 12.5 inches of mercury. The proper vacuum for your herd will depend on the milking system and most importantly the inflation and pulsation design. Typical levels are: Lowline 12 - 13.5; Midline or mid jar 13-14.5; high line 13.5 - 15. Too many units per slope is a common problem in older systems.

Recommendations for units per slope will vary with design, slope and milk flow rate. In general the low numbers are for typical systems with 1 inch per 10 feet of slope and the high number is for accelerated slope systems such as parlors. For more information refer to the Dairy Practices Council Guideline 2, 4 or 102 on milking systems for cattle. (www.dairypc.org).

Typical ranges:

1.5"	lines are obsolete and should be replaced
2"line	2 - 4 per slope
2.5" line	6 - 9 per slope
3" line	11 - 16 per slope

Prudent Treatment Plan

A Treatment plan for mastitis should be developed with your veterinarian before problems start. This treatment plan should include:

- What to do when specific problems occur?
- Who will do the treatment?
- What records and withholding procedures will be utilized?
- Dry-cow therapy program.

Culling

Cull those animals that repeatedly have mastitis problems. At times high SCC problems are from a poor culling and treatment plan more than from new infections. If high SCC animals are not culled, as new infections occur the percentage of high SCC animals increases and so does bulk tank SCC. A rule of thumb to judge your mastitis program is that you should not be treating

more than 1% of your animals for mastitis during one month and only half of those should be new cases. If you are treating more than that you should contact your veterinarian and investigate why there is such a high infection rate.

Records

Good records are important in the long term strategy to maintaining low SCCs. Maintain accurate records of all treatments, including what quarter or half, what medicines were used and the date. Production records and other animal health records are also important to any herd's breeding plans and culling decisions. These records can help identify trends that can be corrected through management.

SCC Crisis Management

Steps to rapidly reduce your bulk tank somatic cell count:

Identify problem animals

Identify the animals causing the high somatic cell count. This can be done a number of ways.

1. One way is to contact DHIA and go onto a testing program that will regularly determine the SCC and milk production information. They have a variety of programs available and if you are not currently receiving SCC information from them they will do one month free. The telephone number for the Vermont DHIA office is 1-800-639-8067.
2. Another alternative is to have your milk handler SCC your individual animals. This option will depend on the milk handler involved. Contact your Milk Handler Field Rep. to see if their lab can handle the number of samples involved.
3. An alternative that can be done right at the farm is the California Mastitis Test (CMT). CMT's have the advantage of giving results for individual quarters, however it is commonly misused and, if not properly done, high SCC animals may be missed. CMT kits are available from most dairy suppliers and come with a set of instructions. The most common mistake is the use of too much milk and/or reagent. A few streams of foremilk (sampled before milking the animal) is stripped out. Then, a small amount of milk is put into the paddle. The paddle is tilted almost vertically so that only ½ to 1 teaspoon of milk remains in each cup. An **equal amount of reagent** is added to the milk and swirled for about 15 seconds. The paddle is then tipped back and forth to see if any thickening of the milk occurs. The more thickness, the higher the SCC. Any trace amount of gelling on the paddle is around a 300,000 per ml SCC, a thickening of the milk, but not clumping together is around 500,000 to 1,000,000. If it thickens and clumps together it is over 1,000,000. If it thickens and sticks to the paddle the count is generally over 2,000,000. If you are unsure, your inspector, most field reps, and Veterinarians have done CMTs and can help. **NOTE: CMTs must be read under a good bright light and the reagent needs to be stored properly. Follow label directions for storage.**

Culture and treat or cull

Work with your veterinarian to develop a treatment plan for the high SCC animals. Your veterinarian may want to culture some or all of the high SCC animals. Work with your veterinarian and make decisions on each animal as to the economics of dry off and treating; culling, or lactational treatment. With animals that are treated and not dried, do an SCC in about 3 weeks and consult your veterinarian to see if repeat culture and treating is needed or do the animals go onto the cull list. **Remember, do not treat based on SCC results alone, work closely with your veterinarian to ensure you are properly handling the animal treatment decisions and keep good records.**

Summary

In summary, the key to long term low Somatic Cell Counts is prevention and that can be summarized to Five Points:

1. Proper milking procedures
2. Clean, dry, well nourished, comfortable animals
3. Properly operating and maintained milking system
4. Work with your Veterinarian on a good treatment plan
5. Cull chronic offenders
6. Records - animal history and treatment

If you already have a problem, develop a team approach to solve the problem. Work with your veterinarian, milk handler field representative, Vermont state dairy inspector, UVM Extension, DHIA, Vermont Agency of Agriculture's Milk Quality Enhancement Program and others as needed to develop a cohesive strategy to resolve the short term problem and prevent it from re-occurring. For help with long term prevention you can contact Laurel Junkins, Dairy Systems Coordinator, at 802 793-3868 or email at "ljunkins@agr.state.vt.us".

Milking Procedure

- A. Completely Dip each Teat
- B. Observe the Foremilk
- C. Wipe Dry with Individual Towel
- D. Attach Unit
- E. Keep Unit Adjusted
- F. Shut Off Vacuum then Remove Unit
- G. Dip Teats

Milk Quality Enhancement Program Vermont Agency of Agriculture, Food and Markets

For more detail read reverse side

Below is a further explanation of the milking procedure on the front of this sheet. Please post this in the milkhouse or milking parlor for review by personnel as needed

Animals should be maintained in a clean dry environment 24 hours a day

When predipping, it is very important to cover the entire teat. It is difficult to consistently cover the entire teat when spraying. Spraying in a tie stall barn is not recommended.

If teats are heavily soiled, wash with an individual paper towel dipped in an udder wash solution compatible with your predip.

A. **Completely Dip** each teat. Use a product that is labeled as a predip and has been shown to be effective at preventing mastitis*. **Be sure to cover the entire teat** and allow for at least 30 seconds of contact time.

B. **Observe** the foremilk from each teat for abnormalities. This stimulates letdown, checks for mastitis and sanitizes your hands. **Do not strip milk into your hand.**

C. **Dry** teats thoroughly with individual paper towels removing all the teat dip to prevent any residue, If predip has dried then redip and remove while wet. **Do not touch teats after removing the dip.**

D. **Attach** the milker unit within one minute after the start of stimulation. **Do not attach to blind quarters as they may contaminate the milk and spread mastitis to other animals.**

E. **Adjust** unit as necessary for proper alignment to prevent squawks', especially at the end of milking when the slightest 'squawk' may increase new cases of mastitis.

F. **Shut off** vacuum before removing unit.

C. **Dip** teats immediately after unit removal with a product that has been shown to be effective at preventing new cases of mastitis*.

Discard used dip and wash dip container after each milking.

Caution: In freezing weather dip should be removed or allowed to dry before animals are turned out.

*Efficacy, ability to prevent mastitis, can be shown through research protocols recommended by The National Mastitis Council. The dips are tested under either experimental challenge or natural conditions.

For further explanation or for assistance with your milk quality problems please contact Laurel Junkins at the Milk Quality Enhancement Program (802) 793-3868 or email to ljunkins@agr.state.vt.us