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Mastitis Control Programs

Troubleshooting a Mastitis Problem Herd

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Any dairy herd that continually has a somatic cell count (SCC) above 400,000 cells/ml has a problem. Somatic cells are produced in response to an inflammation. Inflammation in the udder is called mastitis. If your bulk tank SCC is 750,000 or greater, you are in danger of losing your milk market in North Dakota. Since mastitis can be caused by man, machine, and environment, check all items to determine its cause. Records of cow treatments for at least two consecutive months are needed to determine if you have a few cows a with mastitis or a herd problem. Here are some troubleshooting tips to use if you're experiencing somatic cell counts higher than you like.

Using Bulk Tank Report

One of the most accurate methods of diagnosing problems is bulk tank analysis. Before drastic measures are taken, a second bulk tank sample should be taken several days after the first. A sample report (Figure 1) is included for reference only and may differ from the report you receive. Tables 1 and 2 are explanations that can be used to determine the problem and how to solve it. The pathogens are categorized as follows and the generally accepted control measures are given for each broad category.

Contagious bacteria are usually responsible for high SCC and are controlled by a teat dip covering the whole teat (no spraying) and by dry cow therapy.

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Environmental bacteria do not usually cause high cell counts. Environmental bacteria are controlled by milking clean, dry udders and keeping the cow environment as clean and dry as possible. They may include high coliform counts caused by milking wet udders.

Milk quality tests are helpful in determining bacteria count problems. Lab pasteurized count is an indicator of herd mastitis levels and bacteria counts; standard plate and pre-incubation (P.I.) counts are indicators of bacteria in the milk.

Dairies may get by with one bulk tank SCC sample a month, except in herds with a large percentage of purchased replacements. In such a herd, a weekly test might be considered. Any change in pathogens such as *Streptococcus agalactiae* or *Mycoplasma* in these herds can be controlled because they are usually in new animals that entered the milking string since the last sample. Sample those animals and take action before an epidemic starts.

Problem-Solving a Mastitis Problem

400,000-750,000 cells/ml SCC Count Bulk Tank Analysis

1. Clean pulsators.
2. Clean vacuum controllers.
3. Check milking procedures. Are you milking clean, dry udders and shutting off vacuum to the claw before removing the unit?
4. Check teat dipping procedures. After milking, is there any visible dip on the teats? In problem herds, teats must be dipped with a cup (not sprayed). Dip to the base of the udder.
5. Review dry cow program. Are all quarters dry treated before going dry?

Above 750,000 cells/ml SCC Count

1. Follow procedures 1 through 5 above.
2. Use the paddle test or individual cow cell counts to identify problem cows. Consider early dry off of late lactation pregnant cows or culling of those that are not pregnant. If this does not lower your cell count enough to sell milk, more drastic measures must be taken. Treating all high cell count cows usually lowers the cell count but is very expensive due to the high cost of drugs and dumped milk.
3. Consult your veterinarian, county extension agent, or sanitarian for further help.

Stage of Lactation and Mastitis

If most new cases of mastitis occur at calving, you should review your dry cow program by asking yourself three questions: 1) Are all cows dry treated with an approved dry cow antibiotic? 2) Are teat ends cleaned with cotton and alcohol before treatment? 3) Are dry cows kept in a clean, dry environment and allowed to calve in a clean, dry place?

Troubleshooting a High Bacteria Count Herd

High bacteria counts are usually caused by poor cleaning of milking equipment, improper cooling of the milk, and/or herds with *S. agalactiae*.

1. Use the Bulk Tank Culture Report (Figure 1) sheet to help identify the cause of high bacteria problems.
    a. If lab pasteurized count is high, this means that there is a buildup on the milking equipment. Some sort of cleaning problem has occurred – improper water temperature, improper soap concentration, or air injector not working.
    b. If *S. agalactiae* count is high and lab pasteurized count is low, bacteria may be in the cows' udders.
2. Check rinse cycle water temperature – it should be cool, not hot. Discard rinse water after use.
3. Check water temperature in wash sink. It should be 160° F at the start of wash cycle and 110-120° F at the end.
4. Check if the proper amount of pipeline cleaner is being used and if it is stored with the cover on. Dry chlorine will evaporate if the cover is left off.
5. Check if a dairy sanitizer is used before each milking. Bulk liquid chlorine doesn't always work.
6. Check if the air injector works. If not, poor cleaning will result.
7. Clean out all vacuum lines, pump to trap, and pulsator lines with a lye or cleaning solution.
8. Replace every rubber or plastic hose in the system, including liners.
9. Dismantle and clean the milk pump.
10. Check milk temperature. If temperature is high, recharge the cooling system.
11. Check for a buildup of material in the lines. It may be necessary to dismantle all milk lines and clean them with a brush. The bulk tank may also have to be manually scrubbed to remove buildup.
12. If you have a high somatic cell count (SCC) along with a high bacteria count, you may have a cow problem – not a cleaning problem. Handle this situation the same as you would a high SCC problem. Refer to Extension Circular AS-1053, Bulk Tank Milk Culture, Interpreting the Results, for more detail on sources of mastitis-causing bacteria and their control.

How to Handle a Mycoplasma Problem Herd

Mycoplasma infection is an untreatable condition. Because of this, you should attempt to prevent it, or at least prevent its spread. The only way to know if you have *Mycoplasma* is to sample for it. The following are some possible procedures you can take to approach a mastitis problem if you suspect *Mycoplasma*.

No Sample Approach

- Cows with *Mycoplasma* infections usually exhibit the following symptoms:
  - Multiple quarters with clinical mastitis.
  - Mastitis which does not clear up with treatment. Cow does not exhibit symptoms.
  - Drop in milk production.
- Teat dip after milking to stop cow to cow spread.
- Use only premixed commercial tubes — do ***not*** make your own mixes to treat intramammary.

If you routinely cull this type of animal, *Mycoplasma* will come and go and you will never know it.

Sample Approach

When *Mycoplasma* appears:

- Assess post-milking teat dip procedure.
- Cull cows with clinical mastitis in multiple quarters which don't show improvement.
- Sample animals added to the milking string since last bulk tank sample.
- Conduct regular bulk tank analysis.

Take great care in sampling to prevent spread of *Mycoplasma* from sample bottle. Wear rubber gloves and sanitize them between cows.

What NOT to Do in a Mycoplasma Crisis

- Do not panic.
- Do not sample the whole herd (too expensive).
- Do not rinse milkers with water.
- Do not buy backflushers.
- Do not try to separate healthy and infected cows unless a significant portion of the herd is infected. This is not effective and usually causes many other problems such as changes in milking routines.

Example of a Bulk Tank Culture Report

Owner _____ Sampler _____

Date Sample Taken _____ Date Sample Received _____ Tank # _____

	Your Lab Results	Ideal Range
Contagious Bacteria:		
Staphylococcus (Coagulase Positive)	_____	0
Streptococcus		
agalactiae	_____	0
dysgalactiae	_____	0 - 500
Corynebacterium	_____	0 - 500
Mycoplasma (7 day test)	_____	Negative
Environmental Bacteria:		
Streptococcus uberis	_____	0 - 500
Coliforms	_____	0 - 500
Bacillus	_____	0 - 500
Other:		
Staphylococcus (Coagulase Negative)	_____	0 - 500
Milk Quality Tests:		
Lab Pasteurized Count	_____	0 - 1,000
Somatic Cell Count	_____	0 - 200,000
Standard Plate Count	_____	0 - 10,000
P. I. Count	_____	0 - 10,000

Lab clinician _____ Date _____

Figure 1. After milk sample is analyzed by laboratory, you will receive a Bulk Tank Culture Report. Compare bulk tank milk sample analysis with the recommended ranges and file for future reference.

Table 1. Interpretation of bulk tank sample analysis levels and suggested control.

Contagious Bacteria	Normal Levels	Moderate Levels	High Levels	Control
Staphylococcus (coagulase +)	0	100-400	> 500	Teat dipping and dry cow therapy
Streptococcus agalactiae	0	100-5,000	> 6,000	Teat dipping and dry cow therapy
Streptococcus dysgalactiae	< 500	500-1,000	> 1,000	Teat dipping and dry cow therapy
Corynebactenum bovis	< 500	500-1,000	> 1,000	Teat dipping and dry cow therapy
Mycoplasma	Negative	Positive	Positive	Teat dipping and culling

Environmental Bacteria	Normal Levels	Moderate Levels	High Levels	Control
Streptococcus uberis	< 500	500-1,000	> 1,000	Milk clean dry udders, pre-dip*
Coliforms	< 500	500-1,000	> 1,000	Milk clean dry udders pre-dip*
Misc. (Bacillus, Pseudomonas, etc.)	<300	400-1,000	> 1,000	Milk clean dry udders, pre-dip*
Staphylococcus (coagulase -)	500	600-1,000	> 1,000	Milk clean dry udders, pre-dip*

Milk Quality Tests	Normal	Medium	High	Indicator of
Lab Pasteurized Count	< 1,000	1,500	> 1,500	Dirty milking equipment — check wash-up procedures
Somatic Cell Count (X 1000)	200	300-400	> 500	Udder health in the herd
Standard Plate Count	< 10,000	20-40,000	750,000	# of visible bacteria in milk sample
P.I. Count	< 10,000	20-40,000	750,000	Milk-keeping properties and sanitation on dairy

* Remember pre-dipping has been proven to be effective only on clean, dry udders.

This table will aid In the interpretation of bulk tank analysis. Good management procedures are probably being practiced when results are within normal levels. Hygiene procedures should be evaluated when results exceed normal levels.

Table 2. Bulk tank bacterial types, with common sources and modes of spread and control therapy.

Contagious Bacteria	Source	Means of Spread	Control
Staphylococcus (coagulase +) aureus	Infected udders, teat lesions, udder skin	Cow to cow by contaminated udder wash rags, teat cups, hands	Teat dipping and dry cow therapy
Streptococcus agalactiae (causes high SCC counts)	Infected udders, rags, teat cups, hands	Cow to cow by contaminated udder wash	Teat dipping and dry cow therapy
Streptococcus dysgalatiae	Infected udders, feces, skin	Cow to cow by contaminated udder wash rags, teat cups, hands	Teat dipping and dry cow therapy; milk clean, dry udders
Corynebacterium bovis	Teat canal	Inhabits the teat canal, appears in tank milk when cows are not pre-stripped	Teat dipping and dry cow therapy
Mycoplasma	Infected udders, contaminated antibiotic mixes in bottles	Cow to cow by contaminated udder wash rags, teat cups, hands Once contracted, it is not curable. Cull.	To stop spread: teat dipping — use commercial preparations.

Environmental Bacteria	Source	Means of Spread	Control
Streptococcus uberis	Numerous locations on infected udders and on cow; hair, lips, vagina, feces, as well as bedding, muddy lots	Environment to cow by: wet, dirty lots and bedding; milking wet teats; poor udder preparation	Milk clean, dry udders, pre-dipping may help
Coliforms	Manure, bedding, green sawdust	Environment to cow by: wet, dirty lots and bedding; milking wet teats; poor udder preparation	Milk clean, dry udders, pre-dipping may help
Bacillus, Pseudomonas, etc.	Hoses, dirty water, milk, manure, bedding	Environment to cow by: wet, dirty lots and bedding; miking wet teats; poor udder preparation	Milk clean, dry udders, pre-dipping may help, replace wash hoses
Staphylococcus spp.: (coagulase -) epidermidis, Hyicus micrococcus, etc.	Normal inhabitant of udder skin	Poor udder preparation, milking wet udders and teats	Milk clean, dry udders

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