

Trouble-Shooting a Mastitis Problem Herd¹

David R. Bray and Jan K. Shearer²

Introduction

What is a mastitis problem herd? Any herd that continually has a cell count above 400,000 cells/ml can be considered a problem. But herds that have a cell count of nearly 1 million cells/ml, and are close to losing their market, are usually considered a serious problem.

Since mastitis can be caused by man, machine, and the cow's environment, all items must be checked to determine its cause.

Variations in Clinical Mastitis

The number of cows or quarters treated for clinical mastitis can vary from herd to herd even though they may have identical mastitis occurrence. The time or season of the year also may be a factor. An average of 1-3% of the cows in the pot, or hospital, herd (per day) over a year's time is probably typical for a Florida herd.

An increase or decrease in the number of clinical mastitis cases may result from a change in the people doing the milking. If the milkers stop checking for clinical mastitis, the number will decrease. If no one

had been checking for clinical mastitis and suddenly started checking, the number of cases would increase dramatically even though nothing had changed in the mastitis level of the herd. In many herds, number of cases increases during hot, muddy conditions when environmental organisms are the cause.

Do you have a herd mastitis problem, or just a few cows with a mastitis problem? By recording cows treated during one consecutive month and comparing them with the cows treated in the previous month, you can determine if the same cows are being treated over and over again. If so, you may consider removing those cows from the herd.

Stage of lactation and mastitis

If most new cases of mastitis occur at calving, you should review your dry cow program by asking yourself these 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? and

1. This document is Circular 1164, one of a series of the Dairy and Poultry Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. First published: May 1996, reviewed February 2000 and November 2009. Please visit the EDIS Web site at <http://edis.ifas.ufl.edu>.

2. David R. Bray, Extension Agent IV, Milking Management and Mastitis, Dairy and Poultry Sciences Department, and Jan K. Shearer, Associate Professor, D.V.M., College of Veterinary Medicine - Large Animal Clinical Sciences, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

3. are dry cows kept in a clean, dry environment and allowed to calve in a clean, dry place?

Using a bulk tank report

One of the most accurate methods of diagnosing problems is with a bulk tank analysis, but before any drastic measures are taken, a second bulk tank sample should be taken - several days apart. A sample report is for reference only, and the explanations can be used to determine the problem and how to solve it. Contagious bacteria usually are responsible for high cell count and are controlled by teat dipping covering the whole teat (no spraying) and by dry cow therapy. See Table 1, Table 2, and Table 3.

Environmental bacteria usually do not cause high cell counts. Environmental bacteria are controlled by milking clean, dry udders and keeping the cows' environment as clean and dry as possible.

High coliform counts are usually caused by milking wet udders. The milk quality tests are helpful in determining bacteria count problems. The lab pasteurized count is an indication of dirty equipment, the somatic cell count is an indication of herd mastitis levels and the bacteria counts, standard plate and P.I. counts are indications of bacteria in the milk.

We advise that all large dairies (more than 1000 cows) have a tank sample taken each week. Smaller dairies may get by with one sample a month. Any herd with a large percentage of purchased replacements might consider a weekly test. In such a herd, any change in pathogens, such as *Strep. ag.* or *Mycoplasma*, can be controlled because they are usually in the new animals that entered the milking string since the last sample. Those animals can be sampled and action taken before any epidemic starts due to your milkers not dipping teats after milking.

Problem-solving when cell count range is 400,000-750,000 cells/mi

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, teat must be dipped with a cup (not sprayed). Dip to the base of udder.

5. Review your dry cow program. Are all quarters dry treated before going dry?

Problem-solving when cell counts are above 750,000 cells/mi

1. Follow procedures 1 through 5 above.
2. You are in danger of losing your milk market; you may wish to use the paddle test or use individual cow cell counts to identify high count cows. Late lactation pregnant cows can be dried off early. You may wish to cull late lactation cows that are not pregnant. If this does not lower your cell count enough to sell milk, more drastic measures must be taken. Treating all the high cell count cows will usually lower the cell count but, because of the high cost of drugs and dumped milk, it will be very expensive.
3. Consult your veterinarian, county Extension agent, or sanitarian for further help. Your county Extension agent also has other fact sheets available on mastitis and checking milking equipment.

HOW TO HANDLE MYCOPLASMA PROBLEM HERDS

You only know if you have mycoplasma if you sample for it. Since it's untreatable, you should prevent it, or at least prevent the spread of it.

No sample approach

- Teat dip after milking to stop the spread from cow to cow during milking.
- Use only premixed commercial tubes - do not use bottle mixes to treat intramammary.
- Mycoplasma cows usually exhibit the following symptoms:
 - More than one quarter with clinical mastitis.

- This mastitis does not clear up with treatment and the cow does not show any signs of sickness.
- Drop in milk production.
- If you routinely cull the above type animals, mycoplasma will come and go and you will never know it. It won't spread if you do a good job of teat dipping and avoid using bottle mixes.

Simple sample approaches

- Regular bulk tank analysis.
- When mycoplasma appears:
 - Make sure you are doing a good job of postmilking teat dipping and do not use bottle mixes.
 - Cull cows that have multiple quarters with clinical mastitis that don't improve.
 - If records are kept of animals entering milking string, the animals since the last bulk tank sample can be sampled.

This approach usually will take care of these problems.

Full scale samples

- Expensive.
- Take great care in sampling - wear rubber gloves and sanitize them between cows, or you will spread mycoplasma from sample bottle to sample bottle and think you have an epidemic when you only have a couple of cows infected.
- Epidemics usually happen by spreading from cow to cow using bottle mixes. If you have an epidemic and use bottle mixes, review your past herd records - these are your mycoplasma 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 you have hundreds of infected cows). This is not effective, and it usually causes many other problems such as changes in milking routines.

Trouble-shooting a herd with a high bacteria count

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

1. Using the Bulk Tank Analysis sheet (Table 1) is a major step in identifying the cause of high bacteria problems (see Table 2 and Table 3).

a) If the lab pasteurized count is high, this means that there is a build-up on the milking equipment, so some sort of cleaning problem has occurred; improper water temperature, improper soap concentration, or air injector not working.

b) If the *Strep. ag.* count is high and the lab pasteurized count is low, the bacteria may be in the cows' udders.

2. Check hot water temperature during the rinse cycle - it should be cool, not hot. Rinse water should be discarded.

3. Check hot water temperature in the wash sink. It should be 160°F at the start of wash-up and 110-120°F at the end of the wash cycle.

4. Is the proper amount of pipeline cleaner being used? Is the cleaner stored with the cover on? Dry chlorine will evaporate if cover is left off.

5. Is a dairy sanitizer used before each milking? Bulk liquid chlorines don't always work.

6. Does the air injector work? 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 high, recharge the cooling system.

11. If there is a build-up of material in the lines, it may be necessary to dismande all milk lines and clean them with a brush. The bulk tank also may have to be manually scrubbed to remove build-up.

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. You must handle this situation the same as you would a high SCC problem.

Table 1.

Table 1. After your milk sample is analyzed in a laboratory, you will receive a Bulk Tank Analysis report.		
BULK TANK ANALYSIS		
Owner_____	Clinician_____	
Date Sample Taken_____	Date Sample Received_____	Tank#_____
Contagious Bacteria:		Ideal Range
Staphylococcus (Coagulase Positive)	_____	0
Streptococcus		
agalactiae	_____	0
dysgalactiae	_____	0-500
Corynebacterium bovis	_____	0-500
Mycoplasma (7day test)	_____	Negative
Environmental Bacteria:		
Streptococcus uberis	_____	0-500
Coliforms	_____	0-500
Bacillus	_____	0-500
Other:		
Staphylococcus (Coagulase Negative)	_____	0-500

Milk Quality Test:		
Lab Pastuerized Count	_____	0-1,000
Somatic Cell Count	_____	0-200,000
Standard Plate Count	_____	0-10,000
P.1. Count	_____	0-10,000
Technologist_____	Date_____	

Table 2.

<p>Table 2. This table will aid in the interpretation of your bulk tank analysis. Good management procedures are probably being practiced when results are within the normal levels. Hygiene procedures should be evaluated when results exceed these levels.</p>				
CONTAGIOUS BACTERIA	NORMAL LEVELS	MODERATE LEVELS	HIGH LEVELS	CONTROL
Staphylococcus (coagulase +)	0	100-400	> 500	Teat dipping and dry
Streptococcus egalactiae	0	100-5000	> 6000	cow therapy. Teat dipping and dry
Streptococcus dysgalactiae	<500	500-1000	> 1000	cow therapy. Teat dipping and dry
Corynebacterium bovis	<500	500-1000	> 1000	cow therapy. Teat dipping and dry
Mycoplasma	Negative	Positive	Positive	cow therapy. Teat dipping and culling.
ENVIRONMENTAL MASTITIS	NORMAL LEVELS	MODERATE LEVELS	HIGH LEVELS	CONTROL
Streptococcus uberis	<500	500-1000	> 1000	Milk clean, dry udders, pre-dip.*
Coliforms	<500	500-1000	> 1000	Milk clean, dry udders, pre-dip.*
Misc. (Bacillus, Pseudomonas, etc)	<300	400-1000	> 1000	Milk clean, dry udders, pre-dip.*
Streptococcus (coagulase -)	500	500-1000	> 1000	Milk clean, dry udders, pre-dip.*
MILK QUALITY TEST	NORMAL	MEDIUM	HIGH	INDICATOR OF
Lab. Pasteurized Count	<1000	1500	> 1500	Dirty milking equipment - check wash-up procedures.
Somatic Cell Count X 1000	200	300-400	> 500	Udder health in the
Standard Plate Count	<10,000	20-40,000	750,000	herd. # of visible bacteria
P.I. Count	< 10,000	20-40,000	750,000	in milk sample. Milk-keeping properties and sanitation on dairy.

Table 2.

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

Table 3.

Table 3. 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, etc.	Cow to cow by contaminated udder wash rags, teat cups, hands, etc.	Teat dipping and dry cow therapy.
Streptococcus agalactiae (causes high somatic cell counts)	Infected udders	Cow to cow by contaminated udder wash rags, teat cups, hands, etc.	Teat dipping and dry cow therapy; milk clean, dry therapy.
Streptococcus dysgalactiae	Infected udders, feces, skin	Cow to cow by contaminated udder wash rags, teat cups, hands, etc.	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 prestripped.	Teat dipping and dry cow therapy.
Mycoplasma	Infected uddem, contaminated antibiotic mixes in bottles	Cow to cow by contaminated udder wash rags, teat cups, hands, etc.	To stop spread: Teat dipping - use commercial tubes, not bottle mixes. Once contracted, it is not curable.
ENVIRONMENTAL BACTERIA	SOURCE	MEANS OF SPREAD	CONTROL
Streptococcus uberis	Numerous locations on infected uddem and on the cow; hair, lips, vagina, feces, etc., as well as bedding, muddy lots, etc.	Environment to cow by: wet , dirty lots and bedding; milking wet teats; poor udder preparation.	Milk clean, dry udders, pre-dipping may help.
Coliforms (E. coli, Klebsiella, etc.)	Manure, bedding, green sawdust	Environment to cow by: wet, dirty lots and bedding; milking wet teats; poor udder preparation	Milk clean, dry udders, predipping may help.

Table 3.

<p>Bacillus, Pseudomonas, etc.</p>	<p>Hoses, dirty water, milk, manure, bedding, etc.</p>	<p>Environment to cow by: wet, dirty lots and bedding; milking wet teats; poor udder preparation</p>	<p>Milk clean, dry udders.</p>
<p>Staphylococcus spp.: (coagulase -) epidermidis, Hyicus micrococcus, etc.</p>	<p>Normal inhabitant of udder skin</p>	<p>Poor udder preparation, milking wet udders and teats</p>	<p>Milk clean, dry udders.</p>