

Mycoplasma Mastitis

general facts:

- Mycoplasma species are part of the normal flora in the mucous membranes of cattle. They are commonly found in the respiratory and reproductive systems. They can also be associated with systemic disease of these organs and be shed in high numbers in body discharges.
- Mycoplasma is NOT part of the normal flora of the Udder!
- Mycoplasma present in normal cows needs only an opportunity to invade the udder to cause clinical mastitis and a potential infectious outbreak.

clinical signs:

- sudden onset of mastitis, swollen udder. Watery milk, brown to tan, with "sandy" flakes in early cases. Becomes thicker in later stages of disease.
- Acute loss of milk production.
- Unresponsive to antibiotic treatment!
- often infects multiple quarters with no obvious illness. Systemic phase may exist with no signs.
- SCC increases in individual cows. May not be a big contributor to increased Tank SCC unless problem is ignored and a large subclinical population is allowed to develop.
- cows can become chronic carriers, and carry infection from one lactation to the next.

species:

- in order of decreasing severity: M. Bovis (worst kind, most common)
- M. Californicum (infectious, grows fast, can Dx at 2 days)
 - M. Canadense
 - M. Alkalescens
 - M. Bovigenitalium (commonly found in reproductive system)
 - M. Bovirhinis
 - M. Arginini
 - Acholeplasma Laidlawii (non-pathogenic, common contaminant in samples, from wet corrals)

laboratory diagnosis:

individual cow samples: submit (frozen or fresh) samples in milk sample tubes with cow numbers clearly written in no-smear marker pen.

Direct plating only unless otherwise indicated. Samples are read at 3 days preliminary and 7 days final. Most severe clinical myco cases will be diagnosed at 3 days, occasionally 2 depending on species. TNTC represents "too numerous to count" findings, indicating cows shedding a huge number of mycoplasma. 7 day findings tend to be from cows shedding lower number of colonies, perhaps lower risk of infectious spread with these cows.

pooled samples: (tanks or string samples)

All pooled samples will be plated **direct** and **enriched**. Enrichment consists of incubating the milk in a selective broth for two days to enhance mycoplasma growth and increase sensitivity of the test. This is useful in pooled samples where we tend to see lower colony counts due to dilution. The number of colonies isolated from an enrichment sample has no significance, reported as either a positive or a negative. Colony counts from a direct plating may be some help in indicating the severity of situation, and how widespread it may be.

species typing: positive cultures on a previously un-infected herd will be submitted to the UC milk quality lab for typing by fluorescent antibody test. A positive from a pooled sample is preferred to help characterize the herd profile for the current incident. The typing can take up to a week before results are available.

herd reservoir:

-Infected animals are the most important reservoir of Mycoplasma mastitis. A heavily shedding acute mycoplasma mastitis case in a crowded hospital pen with poor milking hygiene is the earmark for a mycoplasma outbreak. Infected animals can come from many sources:

- new purchases (cows or heifers)
- chronic carriers (leftovers from a previous outbreak)
- fresh heifers (secondary to resp. disease as a calf, drinking myco milk, ear infections?)

-Environment: M. Bovis can exist for long periods of time in manure, milk, water, straw, etc. -spread of systemic disease to the mammary gland. Unlikely to occur directly. More likely to have systemic shedding lead to environmental contamination and subsequent infection.

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Prevention:

The main factor in prevention of mycoplasma mastitis in large California dairies will be having a quality surveillance program in place. A routine, effective monitoring program will prevent mycoplasma from becoming prevalent in the herd. Mycoplasma is common enough in the dairy environment that in large dairies you will probably eventually deal with it. The goal is to prevent "wrecks" before they happen by good hygienic routines to limit spread and routine sampling for early detection.

- prevention steps:**
- 1) Purchase cows or replacements from myco-free herds. This can be assured by sampling herds (bulk tank) or individual animals prior to purchase. Alternative is to maintain a closed herd.
 - 2) Routine sampling of bulk tank (1-2x per month).
 - 3) Sample all cases of clinical mastitis prior to treatment.
 - 4) Sample all fresh cows if you are recovering from a mycoplasma outbreak.
 - 5) Maintain a clean, stress free environment for the cows. This includes clean and dry bedding, properly functioning milking equipment, and good general animal husbandry.
 - 6) Use separate, single use commercial mastitis tubes for udder infusion. Rinse or dip hands between hospital cows in 25-50 ppm iodine sanitizer.
 - 7) Backflush machines between cows. (25-50 ppm iodine @ pH <3.5)
 - 8) teat dip all cows after milking with a %1 iodine dip. Teat dip all hospital cows (fresh and clinical mastitis) **before** and **after** milking. Do not remove the dip before placing the milking machine on the cow, since this milk does not make it to the bulk tank.

Control during an outbreak: Once established within the milking herd, mycoplasma mastitis is most often spread during milking. Spread between quarters in the same cow is possible via the bloodstream of an infected cow. Spread between cows can occur due to contaminated drugs and poor infusion techniques, as well as by milkers hands taking milk from cow to cow or machine spread within a hospital. Control steps are as follows.

- 1) All cows with clinical mastitis and a Mycoplasma isolate should be beefed.
- 2) Use only sterile, single dose commercial mastitis tubes for treatment. Many Mycoplasma wrecks are associated with contaminated intramammary treatment. All use of multiple dose containers to treat quarters must be stopped and products discarded.
- 3) Emphasize milker hygiene, particularly with the hospital pen. Wear rubber gloves and rinse hands with sanitizer between each cow. Allow no milk to spread from cow to cow.
- 4) Check out milking equipment to assure proper function. Backflushing units will prevent machine spread by contact. Particularly important if hospital is bigger than the total number of milking units.
- 5) Keep culturing all clinicals, fresh cows, and new herd additions. Periodic string samples should be used to isolate infected groups if the tank is positive for mycoplasma and infections are not limited to hospital pen. Quick lab turnaround can be important in an outbreak, so submit samples often.
- 6) Use single use, disposable paper towels to dry cows in the hospital pen. Do NOT use cloth towels in the hospital pen, particularly during an infectious outbreak.
- 7) Clean out teat dip cups after milking hospital.
- 8) Do not feed mycoplasma milk to calves without pasteurization.
- 9) Identify cows and sample tubes carefully and clearly. Culling off lab results requires an efficient and effective ID scheme.
- 10) Keep tabs on your hospital. Watch for sudden mastitis which is non-responsive to treatment. Keep an accurate hospital count, and keep track of the number of times cows are being treated. Long hospital stays and multiple treatments may be a clue to a bigger problem. Consider no-tube treatment during an outbreak to make beefing easier. Keep the hospital small to cut your losses.
- 11) During an outbreak, many cows become infected during their visit to the hospital, or else do not shed immediately on first hospital day. Consider taking hospital "exit" samples to help control spread of myco back to the the clean herd. This method has been very successful in some outbreaks, where a majority of the positive cows have been identified this way.
- 12) Milk non-mastitic hospital cows first (fresh cows, sick cows). If possible, keep a separate hospital pen for mastitic and non-mastitic cows.