

Valley Veterinarians, Inc. Mastitis Lab
Staph Aureus Mastitis

Ken Mitchell, DVM

general facts:

-commonly found on teat and udder skin. Will grow on skin following injury due to overmilking or improper machine function, but does not survive well on healthy, intact teat skin.

-Primary reservoir of *Staph Aureus* in a herd is infected udders.

Considered contagious because the organisms are easily spread from infected quarters to other quarters and cows. Transmission of the organisms to uninfected cows and quarters occurs mainly at milking time. Objects that may transmit bacteria include contaminated milking units, common towels, milkers hands, etc.

clinical signs:

-usually presents as a chronic sub-clinical mastitis, with mild to severe clinical episodes in some cows.

-mastitis caused by *Staph Aureus* produces tissue damage and decreased milk production, with reported losses of 45% per quarter and 15% per cow. Additional losses include recurring mild clinical mastitis and occasionally, a life-threatening gangrenous mastitis at calving.

-mastitis caused by *Staph Aureus* is associated with very high somatic cell counts. High bacteria counts in bulk tank milk are usually not seen with *Staph Aureus* mastitis. However, as the number of infected cows increases, the bulk tank milk SCC increases, resulting in decreased milk quality.

treatment:

-*Staph Aureus* infections, in general, respond poorly to intra-mammary treatment with antibiotics (<30%). The organism invades the glandular tissue, and the body tends to wall off the infected areas with abscess formation. Consequently, milk production capacity is reduced, and the resulting scar tissue prevents antibiotic therapy from being effective.

-Dry cow treatment may give better results, but chronic infections can persist into subsequent lactations. Infected cows should be identified, segregated, and milked last at every milking. These animals should be culled when daily feed costs exceed income from milk production.

-extended therapy with Pirsue near dry followed by Quartermaster at dry may be attempted, along with intra-muscular penicillin. Success will vary from dairy to dairy and cow to cow. Such programs must involve follow-up cultures at the next lactation.

-Early treatment of new infections can be effective. However, chronically infected cows respond poorly to lactational therapy. Aggressive treatment of young cows with recent infections may be economically justifiable, with intra-mammary antibiotics and systemic penicillin. Cure rates for older cows with chronic infections will be much poorer. Treatment attempts must involve culture, treatment, re-culture, and re-treatment to assure efficacy.

-due to the limitations of treatment of *Staph Aureus* infections, the preferred method for controlling this disease is through prevention of new infections.

laboratory diagnosis:

individual cow samples: submit fresh or frozen in milk tubes with cow numbers clearly written.
Plated MWF, results usually the next day.

tanks or string samples: *Staph Aureus* diagnosed in a tank sample is an indication of an important infection. However, the number of colonies in the tank does not always relate to the percent of infected cows.

other information: individual cow SCC

clinical mastitis records

herd expansion or purchase (co-mingling of cows from diverse sources?)

Is a diagnosis of *Staph Aureus* (in a cow or a tank) important?

Economics of milk production, milk pricing, etc. relate to SCC as a measure of milk quality and inflammation, not directly to infection. However, presence of infection can indicate a risk factor for the rest of the herd, especially in a situation of herd expansion, introduction of new animals, new environment, or extremely poor hygiene or poor milking machine function.

Staph Aureus Mastitis

Control:

To control *Staph Aureus* infections in a dairy herd, it is necessary to limit the spread of this organism from cow to cow, and to reduce to a minimum the number of infected cows in a herd. Milk from infected cows should never come in contact with uninfected cows.

- Staph Aureus* infected cows should be identified and milked last, or milked with a separate unit.
- Culture all clinical mastitis cases, isolate staph cows.
- Culture all fresh cows as they enter the herd. Culture fresh cows for at least 2 months to account for the dry period. Culture fresh heifers regularly.
- Beef all infected cows you can. Staph cows may not be automatic "beefs", but they should be considered to have "2 strikes" already, no extra chances.
- Treat staph cows you elect to keep. Cure rate may be low, but treatment may decrease shedding. If a staph cow visits the hospital more than once, beef her.
- Backflush system, or manually backflushing with a drop hose, will help decrease spread.
- Teat dip religiously with a 1% iodine, high emolency dip. Dip, do not spray!
- Dry treat with quartermaster.
- Mark staph cows with special ear tags, leg bands, etc.
- Maintain proper milking equipment function, perform regular checks.
- Review and maintain good barn hygiene in the milk barn. Wear rubber gloves, dip hands in sanitizer if they come in contact with milk.
- Particular care with hygienic procedures should be applied to the hospital pen. Review proper udder infusion techniques for mastitis and dry cows. Allow no milk to spread from cow to cow.
- use single use, disposable paper towels when milking hospital pen. Do NOT use cloth towels in the hospital pen.
- Clean out teat dip cups after milking hospital.
- Monitor "clean" tank (prior to staph string). Periodically sample and/or cull high SCC cows.

Hygiene is the most important thing to focus on. If hygiene is perfect and a person regularly teat dips and dry treats, you will be able to effectively eliminate staph from your herd as a significant problem. However, strict hygiene 24 hours a day is not always possible on a large dairy. Consequently, segregation with the goal of culling and eradication can be effective in controlling staph aureus. It also makes milkers aware that this is a contagious bug, and that hygiene must be respected.

The ultimate goal is to eliminate staph, or at least diminish the level to where it is a manageable risk to the rest of the herd. As the segregated cows are culled, and if hygienic procedures prevent new infections, we will reach a point where there are only a few cows left. These will go to beef, or be mixed with the herd as a "manageable risk". The response to finding staph in the bulk tank must be based on the owner's goals, the quality of the management team, and the economics of total eradication vs. control.

Prevention:

- Routine sampling of bulk tank milk.
- Sample all cases of clinical mastitis prior to treatment.
- Sample all fresh cows in an outbreak.
- Utilize pre-purchase sampling for replacement animals. Bulk tank test for purchasing a herd should be staph aureus free.
- Sample any individual replacement purchases, including fresh heifers.
- Teat dip all cows after milking with a 1% iodine dip. Pre and post dip hospital cows.
- Backflush all machines between cows (25-50 ppm iodine @ pH<3.5)
- Use separate, single use commercial mastitis tubes for udder infusion. Rinse hands between treating cows, use proper hygienic infusion technique.