

Texas Dairy Matters

Higher Education Supporting the Industry

HANDLING *STAPHYLOCOCCUS AUREUS* MASTITIS

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Mastitis is the most costly disease of dairy cattle due to costs associated with treatment, milk loss and extra labor. According to the National Mastitis Council, reduced milk production represents approximately 66 % of the total cost of each case of mastitis. This reduced capacity for milk synthesis is more severe in chronic cases generally observed following contagious mastitis episodes, which can be caused by *Staphylococcus aureus*, *Streptococcus agalactiae* or *Mycoplasma spp.* These cases of mastitis are characterized by decreased milk production, increased somatic cell count (SCC), and increased recurrences usually of the same previously infected quarter.

Among these bacteria, *Staphylococcus aureus* is the most prevalent contagious mastitis pathogen. In a 10 year retrospective study from UC Davis, researchers evaluated more than 300,000 milk samples submitted for microbiology analysis and diagnosed 5.6 % *S. aureus*, 2.4 % *Mycoplasma spp.* and 0.1 % *S. agalactiae*; confirming the higher prevalence of *S. aureus* over the other pathogens.



The main reservoir for *S. aureus* is the infected udder. Bacteria are spread from the infected quarter to other quarters and to other cows primarily through milk from infected animals contaminating milking machines, milker's hands, towels, flies, or other items used in the milk parlor during milking procedure.

Once infection is established, *S. aureus* colonizes in the mammary gland and destroys cell membranes and damages milk producing tissue (alveoli). Bacteria are then encapsulated by scar tissue forming abscesses. Damaged

milk secreting tissue is then replaced by scar tissue. This abscess formation is one of the main reasons antibiotic therapies have poor cure rates against *S. aureus*. Moreover, *S. aureus* can live inside white blood cells and produce enzymes that inactivate most penicillin-based treatments, further increasing the inefficiency of antibiotic therapies. Recently some extended therapies, that show promise in treating *S. aureus* mastitis, have been approved for up to eight consecutive days of treatment.

The most effective strategy to control *S. aureus* in the herd is preventing new infections and culling chronic animals. Eliminating conditions that allow infections to spread from cow-to-cow is important to decrease new infections in the herd. Such strategies include clean procedures during milking, usage of a single towel per cow, proper udder sanitation before and after milking, routine maintenance of milking equipment, and the use of gloves by milkers during milking. In addition, minimizing stress and proper nutrition can enhance a herd's resistance to mastitis. Some studies have shown that supplementation with vitamin E and selenium, as well as vitamin A and beta-carotene can help prevent mastitis when coupled with proper diet formulation for other minerals such as copper and zinc.

Due to the low treatment response, many producers segregate *S. aureus* positive cows from the rest of the herd and milk them separately. This strategy can be acceptable in some dairies where producers have total control over the herd. However, this strategy can jeopardize the entire herd if these cows are not handled properly. Most of the time positive *S. aureus* cows represent a small percentage of the herd that does not justify the risk. Even though these animals are identified with leg bands and colored ear tags, if one single infected cow is accidentally mixed and milked with non-infected cows due to management problems; the risk of new infections increases several folds. Many other cows can be infected until the resultant new cases are identified.



Designing a good mastitis prevention plan and tools to monitor mastitis are important strategies to control this costly disease. Consider culling animals that cannot be cured as a strategy to protect the herd from severe infections. Your veterinarian can help you design customized strategy plans for your operation.

<http://texasdairymatters.org>

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