



Staphylococcus aureus mastitis

Staphylococcus aureus is Gram positive bacteria that live on the cow's skin and on mucosal surfaces of the nose. It is considered a **contagious** and opportunistic mastitis pathogen. The major source of infection is from another mastitic cow. It is usually spread at milking time from cow to cow and can survive on teat liners for up to 6 milkings (therefore putting the next 6 cows milked using those clusters at risk of getting *Staphylococcus aureus* mastitis. The bacteria can also survive on the hands of milking staff, which then can be spread it to cows in the milking shed.

In dairy herds *Staphylococcus aureus* mastitis is not commonly associated with an increased in Bulk Milk Somatic Cell Count (BMSCC), however when a number of cows become infected, an elevation in BMSCC can be experienced.

The risk of infection with *Staphylococcus aureus* increases with time from calving (days in milk) and affected cows generally have low grade/chronic mastitis. This type of mastitis can greatly affect the milk quality and volume produced with an estimated reduction of production of 45% per quarter and 15% per infected cow. Affected cows generally have high individual somatic cell counts (ICSCC) that persists throughout the lactation.

After the *Staphylococcus aureus* bacteria gains entry to the udder, it rapidly multiplies in the milk ducts and cisterns before penetrating the duct wall and into the mammary tissues. The inflammatory response results in duct blockage and scarring of the associated alveoli. The staphylococci invade the mammary tissue more deeply and are responsible for chronic infection. Extensive scarring can develop rapidly to wall off the infection, therefore creating microabscess. It is uncommon for cows to get sick from this type of mastitis, by small percentage of cows can become severely affected.

The location of the walled-off bacteria make it difficult to cow's immune system and antibiotic to reach and kill the bacteria. On average, treating a cow that has *Staphylococcus aureus* mastitis, only 20-60% of cows will be cured. The cure rates are influenced by the stage of lactation, the age of the cow and how long the cow has had the infection.

General treatment protocols for *Staphylococcus aureus* mastitis infections include:

Mild mastitis - Clots or wateriness that persists for more than 3 squirts of milk

- No intramammary or intramuscular antibiotics
- +/- anti-inflammatories

Moderate mastitis- Changes in the milk and/or a swollen quarter that is hard and warm to the touch (often painful)

- No intramammary or intramuscular antibiotics
- Anti-inflammatories

Severe mastitis- Changes in milk and/or swollen quarter, visibility unwell (reluctant to walk or is down) and a degree of dehydration (sunken eyed). These cows have a bacteraemia/ toxaemia.

- Intravenous antibiotics
- Intravenous anti-inflammatory
- Intravenous fluid therapy
- Intramammary treatment
- Oxytocin in the muscle to aid in the cow letting down her milk
- Stripping the quarters out
- Down cow management- deep bedding, frequent rolling from side to side, lifting twice daily for 20 minutes (if she is willing to stand when lifted) and offering clean water and feed.

Control measures of *Staphylococcus aureus* include:

Milking shed:

- Ensure milking machine performance is at optimal
- Ensure all milk liners have been changed as per manufactures recommendations (or at least 2500 milkings)

Milking shed hygiene

- Ensure gloves are worn in the milking shed.
- Milk clean udders (if they are washed, they should be dried before cups are put on).
- Ensure all teats of all cows receive adequate coverage of teat disinfection post milking.
- Adequate hygiene when dealing with mastitis cases.

Other measures

- Segregation of infected cows and milk last.
- Regular herd testing to monitor individual cow performance and identify cows with high individual somatic cell counts.
- Intramammary dry cow treatment of every cow at dry off.
- Culling of chronically infected cows (these cows have multiple high ICSCC at herd tests thought out a lactation or high ICSCC before and after dry off).

Reference: Parkinson, T. J., Vermunt, J. J., & Malmo, J. (2019). Diseases of cattle in Australasia: a comprehensive textbook. New Zealand Veterinary Association Foundation for Continuing Education. Massey University Press, Auckland, 0745, New Zealand.