



Serratia spp.: A Practical Summary for Controlling Mastitis

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Introduction

The implementation of control measures for contagious mastitis pathogens has successfully reduced the prevalence of these organisms in U.S. dairy herds. However, dairy producers continue to struggle with the control of environmental pathogens. *Serratia* spp. are Gram-negative bacteria that are similar in structure to *Escherichia coli* and *Klebsiella* spp., yet the treatment and control of these organisms remain difficult. The most common mastitis-causing species is *Serratia marcescens*. However, the treatment and control of these organisms is similar across all species of *Serratia*.

Where are these organisms found?

These organisms are commonly found **in soil and plant matter, including feed**. Therefore, cows on pasture or housed on organic bedding material may be at an increased risk for mastitis caused by *Serratia* spp. Herd outbreaks of *Serratia* mastitis have occurred in herds where *Serratia* grew in bedding and/or teat dip. Poor udder cleanliness and damaged teat ends also appear to increase the risk of spreading *Serratia* to uninfected cows.

How do *Serratia* spp. infect the mammary gland?

Serratia spp. will infect uninfected cows through environmental contact. As with all environmental organisms, maintaining a **clean and dry environment** for cows is of utmost importance. Similarly, the use of inorganic bedding (sand), will reduce environmental contamination with these bacteria. However, it is important to remember that recycled sand can also serve as a source of environmental contamination as the organic matter builds on the bedding material.

How can you prevent and control mastitis caused by *Serratia* spp.?

The control of *Serratia* spp. includes implementing proper milking procedures and maintaining a clean and dry housing environment. At milking time, all quarters should be forestripped, which will begin the milk letdown process. Following forestripping, the use of an efficacious premilking teat disinfectant is particularly important for this mastitis-causing pathogen.

Chlorhexidine is not an effective killing agent for *Serratia* spp., and therefore, herds experiencing problems with *Serratia* mastitis should choose an alternative active ingredient.

The premilking teat disinfectant should remain on the teats for 30 seconds prior to removal with either a paper towel or a single-use, clean and dry cloth towel. Following these guidelines, the time from the start of manual stimulation (forestrip or wipe) to unit attachment should be in the range of 60 to 120 seconds. This will allow the appropriate time for milk letdown.

In addition, reducing teat end exposure between milkings by scraping the back of cow stalls (where the udder rests) and applying fresh bedding frequently will be worth your time. In herd-wide problems, quick identification of the *Serratia* source — cows, bedding, or teat dip — is essential to reduce its spread.

When are *Serratia* mastitis infections most likely to occur?

New infections can occur at any time during lactation and may also occur during the dry period. However, cows in early lactation are at an increased risk for new

infections due to the increased stress and immune suppression associated with the postpartum period. Cows with high milk production are not at greater risk than cows with low milk production.

How likely are *Serratia* infections to cure?

Serratia is resistant to most antibiotics; therefore, **cure rates are very limited**. Thus, intramammary antibiotic treatment is not recommended. Some veterinarians have found limited success with the infusion of sterile saline into the gland. This treatment acts to alter the osmolarity and may aid in the elimination of bacteria present in the gland. However, veterinary consultation is recommended prior to the start of any treatment protocol. Due to the limited cure rates with the previously discussed options, **emphasis needs to be placed on prevention** of these infections rather than on treatment.

Teat Dip and *Serratia*

Teat dip does not usually contain *Serratia marcescens*. However, **teat disinfectants can become contaminated with these organisms on-farm**. Furthermore, *Serratia* spp. are commonly resistant to chlorhexidine gluconate disinfectants. Therefore, if a container of disinfectant with one of these active ingredients becomes contaminated, the continued use of this disinfectant can pose a threat to the rest of the herd. Consider culturing your teat dip if *Serratia* spp. is found in more than one cow and especially if one of these disinfectants is used as germicide in your teat dip.

As with any teat disinfectant, it is important to remember that the product should only be removed from the original container. Leftover teat disinfectant from teat dipping cups should never be poured back into the original container or reused for a subsequent milking.

Quick Notes

- *Serratia* spp. are environmental organisms found commonly in soil and plant matter.
- It is imperative to keep bedding clean and dry.
- Use of washed sand bedding will help reduce the environmental load of *Serratia* spp.
- Chlorhexidine-gluconate teat disinfectants are not effective in killing *Serratia* spp.
- Proper milking procedures are extremely important in the prevention of these infections.
- *Serratia* spp. are resistant to most antibiotics, so cure rates are limited.

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