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## ***Serratia* species and Mastitis - QMPS fact sheet**

### ***Introduction***

*Serratia* species are gram-negative bacteria. They are commonly found in the environment, e.g. in soil, plants, feed and water and may be accidental mastitis pathogens (4,9). *Serratia* has also been isolated from bedding and parlor floors (8). Several different species of *Serratia* can cause mastitis, including *S. marcescens*, *S. liquefaciens* and *S. rubidaea*. New infections caused by *Serratia* can occur during the dry period (4,11) and in lactation (7,8,10). Reported outbreaks of *Serratia* mastitis have been associated with growth of the organism in bedding (7,8) and a teat dip cup with a quarternary ammonium disinfectant (12). In other cases, the source of the outbreak was not detected, despite testing of the environment, teat dips, or milking equipment (10,13). Poor hygiene and damage to teat ends are thought to increase the risk of *Serratia* mastitis (2). Even though *Serratia* is considered to be an environmental organism, transmission via the milking machine may occur (7). Strain typing can be used to determine whether *Serratia* isolates belong to different strains, implying that infection or contamination originated from a variety of sources, or to a single strain, implying the predominance of one strain in the environment, infection from a point source or contagious transmission.

### ***Mastitis Characteristics***

Many *Serratia* infections are subclinical and characterized by elevated somatic cell counts in the infected quarter, but clinical mastitis may occur in more than half of the infected animals (4). Clinical signs are most often mild, characterized by flakes and discolored milk. Cows are rarely systemically ill. Infections tend to be chronic and clinical signs may be intermittent. The average duration of infection during lactation was 55 days in one herd (6) and more than 4 months in two other herds (4). Infections can last as long as 10 months (13) or even longer than 3 years (4). In some herds, dry cows and older animals were most likely to be infected (4). In other herds, high producing cows were affected (12), or infection occurred independent of milk production, production string or days in milk (10).

On rare occasions outbreaks of *Serratia* mastitis may have resulted from contagious transmissions (7). On these occasions, infected cows should be isolated or identified in a manner that will allow them to be managed as a distinct group at milking time. Infected cows can be milked last or with a milking unit designated for use in *Serratia* infected cows only.

Between 1992 and 2004, the proportion of herds in which *Serratia* was detected increased significantly. This is based on QMPS herd survey data for 5130 herds in which

at least 50% of the animals were sampled. In the statistical analysis, the increase in average herd size was corrected for. The proportion of herds in which *Serratia* was detected increased from 3% in 1992 to 11% in 2004. The average number of positive animals within a herd has not changed over the same time period. In most herds, only 1 or 2 cows are affected.

### ***Therapy***

Isolates of *Serratia* are resistant to most antibiotics. Treatment with antibiotics results in poor cure rates (9) and is not recommended. Initial clinical improvement may be seen, but in many animals the improvement is only temporary (2). Other authors report that antibiotic therapy in clinical cases and dry cow therapy did not have an obvious effect (7), or that less than 14% of quarters with *Serratia* infection were cured after treatment (6). The majority of cases cure spontaneously (11).

### ***Prevention and Control***

Cow cleanliness, environmental hygiene and milking procedures affect the risk of infection with all mastitis pathogens, including *Serratia* species. Stalls and bedding for all management groups, including dry cows, should be clean and dry and stalls should be bedded with adequate amounts to keep the cows clean and dry. Cow traffic areas should be scraped free of manure as needed (at least twice daily). Teats should be clean and dry before milking units are attached. Pre-dipping teats with an approved, effective dip should be helpful in preventing new infections. Milking units must be cleaned and sanitized after every milking session. At the end of each milking, teat dip remaining in dipper cups should be discarded and the dipper cups should be washed, sanitized and allowed to dry. A high level of hygiene should be used for storage and transfer of teat dips to dispensing containers and dipper cups. Culture bulk tank milk routinely to identify the presence of specific mastitis pathogens. Sample clinical mastitis cases and high cell count cows for bacterial culture. Although some studies did not show survival of *Serratia* in teat-dip containing 0.5% chlorhexidine-gluconate (1), other reports caution that some strains of *Serratia* are resistant to germicides containing chlorhexidine gluconate (9) or quarternary ammonium compounds (3,12). A 1% iodophor teat dip was more effective in prevention of subclinical infections by *Serratia* than a 0.55% chlorhexidine-gluconate teat dip (12 as compared to 23 infections). Clinical cases reported in the same study showed no significant difference (5). Therefore, it is recommended to avoid teat dips containing chlorhexidine-gluconate if *Serratia* spp. mastitis is suspected in a herd (4,9).

### ***Additional Information***

Consult with your veterinarian or QMPS laboratory for additional information or interpretation of results.

Central Laboratory - Ithaca, NY	(607) 255-8202
Western Laboratory - Geneseo, NY	(585) 243-1780
Eastern Laboratory - Cobleskill, NY	(518) 255-5682
Northern Laboratory - Canton, NY	(315) 379-3930



QMPS is a program within the Animal Health Diagnostic Center, a partnership between the NYS Department of Agriculture and Markets and the College of Veterinary Medicine at Cornell University.



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## Sources

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