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Bacillus spp.: A Practical Summary for Controlling Mastitis

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Bacillus spp. are environmental, Gram-positive, endospore-forming pathogens that can cause mastitis. *Bacillus* spp. will grow large, slightly gray colonies with irregular edges that are often surrounded by a clear zone of hemolysis when grown on blood agar. Some *Bacillus* spp. can cause acute and potentially fatal gangrenous mastitis. Spores from *Bacillus* are heat- and chemical-resistant.

Information in this publication was summarized from the National Mastitis Council's Laboratory Handbook on Bovine Mastitis (Hogan et al. 1999).

Where are these organisms found?

Bacillus spp. are typically found in soil, water, dust, feces, air, vegetation, and wounds or abscesses.

How does *Bacillus* spp. spread to the mammary gland?

Bacillus spp. are introduced into the udder via contaminated treatment or treatment devices and as a result of improper teat sanitation prior to intramammary treatment.

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

Aseptic infusions are important for preventing these infections. When infusing the mammary gland either for mastitis treatments during lactation or at the time of dry cow therapy, only single-dose sterile treatment tubes should be used, and teat ends must be scrubbed clean with 70 percent alcohol prior to infusion. During intramammary infusion, partial insertion of the cannula will help to prevent the introduction of *Bacillus* spp. into the mammary gland. *Bacillus* spp. spores are often resistant to heat and chemical disinfectants. However, some *Bacillus* spp. spores on surfaces may be susceptible to the chemical disinfectants peracetic acid and hydrogen peroxide (Hilgren et. al., 2009).

When are *Bacillus* spp. mastitis infections most likely to occur?

New infections can occur at any time during lactation, but most occur when cows have access to pasture. Furthermore, dirty infusions could force *Bacillus* spp. into the mammary gland when using intramammary products either for mastitis treatment or dry cow therapy.

How likely is *Bacillus* spp. mastitis to be cured?

Some *Bacillus* spp. will respond well to broad-spectrum antibiotic therapy. However, bacterial spores are often resistant to heat and chemical disinfectants, which could allow for recontamination of the environment. As a reminder, veterinary consultation is recommended prior to the start of any treatment protocol.

Quick Notes

- *Bacillus* spp. are environmental pathogens that can be found in soil, dust, air, manure, and vegetation.
- *Bacillus* spp. could infect the mammary gland when cows have access to pasture or through dirty infusions prior to intramammary treatment or dry cow therapy.

- Aseptic infusion is the primary way to prevent infection by this pathogen.
- Broad-spectrum antibiotics should be capable of curing some *Bacillus* spp. infections.

References

Hilgren, J., Swanson, K. M. J., Diez-Gonzalez, F., & Cords, B. 2009. Susceptibilities of *Bacillus subtilis, Bacillus cereus, and Avirulent Bacillus anthracis* Spores to Liquid Biocides. Journal of Food Protection, 72(2), 360–364.

Hogan, J. S., R. N. Gonzalez, R. J. Harmon, S. C. Nickerson, S. P. Oliver, J. W. Pankey, and K. L. Smith. 1999. *Laboratory Handbook on Bovine Mastitis*. Madison, WI: National Mastitis Council.

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