

## **Antibiotic Treatments for Mastitis**

by Megan Weisenbeck, DVM, Northern Valley Dairy Production Medicine Center

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How do you decide which antibiotic is best for mastitis? There are only a handful of antibiotics approved for the treatment of mastitis in the United States and most of them have been available for many years. Because of this, one would think choosing a mastitis antibiotic treatment would be simple, and that the ideal choice probably has not changed much over time. However, this is not the case.

There is an excellent review of this topic by Dr. Pam Ruegg in *Veterinary Clinics; Food Animal Practice*. Mastitis is defined as inflammation of the mammary gland, often due to a bacterial infection. Cows get mild (grade one) or moderate (grade two) clinical mastitis about 85 percent of the time and severe clinical mastitis only about 15 percent of the time. Severe cases can be life-threatening to the cow and should be treated as such. However, antibiotic treatments of the other 85 percent require more scrutiny. Around the time of World War II, almost all cases of grade one and two mastitis were caused by *Streptococcus agalactia* and *Staphylococcus aureus*. As a result, antibiotic treatments were developed to treat these organisms. As farmers got better at controlling these two pathogens, coliform bacteria became more common. Now we find that the most common isolates from clinical mastitis are organisms that exist in the cows' environment, which include coliform and *Streptococci*. However, if we count no growth on a milk culture as a result, no growths are actually the most common "cause" of mastitis today. We should care about this because treatment of clinical mastitis should be directed at cows that are more likely to benefit. This makes economic sense and represents better antibiotic stewardship.

The ideal antibiotic choice will vary depending on the bacteria isolated and there are a large number of bugs that will not respond to antibiotic therapy. For example, we know that bacteriologic cure rates for *Staph aureus* are poor (25 percent or less), while treatment for environmental *Streps* and non-aureus *Staphs* would be expected to cure 65 to 75 percent of the time. With treatment of *E. coli*, we would expect 75 percent to cure. However, if we choose not to treat *E. coli*, about 75 percent of cases also cure. Environmental *Streps* often respond well to treatment but have a poor cure rate and high rate of recurrence if not treated. We also know that some environmental *Streps* respond better to longer antibiotic treatments, as does *Staph aureus*. Then there are a organisms that show little, if any response to antibiotic treatment such as yeast, *Prototheca*, *Mycoplasma*, *Pasteurella*, *Trueperella*, *Pseudomonas*, *Serratia*, etc.

Remember, the appearance of the milk in mastitis is deceiving. Just because the milk looks bad, it does not mean treatment is more likely to work, and if the milk still looks bad after treatment it does not mean the treatment did not work. Even when the milk looks normal after treatment, it does not necessarily mean the treatment worked because most of the time milk will return to normal, usually in 4-6 days, whether there is still an infection or not.

According to Dr. Ruegg, only 20 to 33 percent of cases are likely to benefit from non-specific antibiotic treatment. So when we pick an antibiotic treatment at random, it may only work 30 percent of the time or less! Therefore, treatment decisions need to be based on the organism, and protocols should be developed with the input of the herd veterinarian. This is why on-farm culture has become so much more popular in recent years. The choice to treat or not, and what to use to treat is no longer as simple.