

# What is the Best Antibiotic against *Staphylococcus aureus* Mastitis in Lactating Cows?

COOPERATIVE  
EXTENSION  
SERVICE



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Every case of mastitis is costly to the dairy producer in terms of decreased milk production, treatment expense, lower milk quality premiums, and possible culling or death of the affected animal. Indirectly it takes extra time during milking to properly identify a treated cow and discard her milk and there is always the risk of a “hot tank of milk” if a treated cow is accidentally milked into the tank. One frustrating aspect of mastitis treatment is repeatedly re-treating a cow that relapses with an infection in the same quarter multiple times. These “subclinical” infections result when a producer discontinues antibiotic treatment because the milk looks normal but the hard-to-kill mastitis organisms are still alive in the gland and waiting for their opportunity to attack again. *Staphylococcus aureus* is one of the most prevalent bacterial pathogens worldwide and is often the cause of chronic subclinical infections, high somatic cell counts, and clinical (visibly abnormal milk) cases of mastitis. Recently a systematic review of all of the relevant individual studies performed worldwide was undertaken to help veterinarians and producers choose the best antibiotic therapy to use during lactation against *Staphylococcus aureus*. Based on this review and all available data, the best option was found to be extended intramammary therapy for 5-8 days with Pirlimycin (Pirsue®). There was no evidence to support the use of injectable antibiotics at the same time as intramammary therapy (mastitis tubes used in the quarter) to increase cure rates.

An “extended therapy protocol” or “extended duration of therapy” is defined as administering intramammary treatment (mastitis tubes used in the quarter) for 2 to 8 days consecutively. Only two products on the market (Spectramast® and Pirsue®) are labeled for and demonstrated effective with extended therapy. Both products are prescription only so a valid veterinary/ client/patient relationship must exist to obtain these medications. However, extended therapy is not “extra-label”-in other words, a producer can follow the label directions on the box instead of the veterinarian needing to write special or alternate directions for use.

Pirsue® (pirlimycin hydrochloride) is labeled for clinical and subclinical mastitis associated with *Staphylococcus* and *Streptococcus* species including the contagious organisms *Staphylococcus aureus* and *Streptococcus agalactia*, and the environmental organisms *Streptococcus dysgalactiae* and *Streptococcus uberis*. The label directions state to infuse one syringe into each affected quarter and repeat the treatment after 24 hours. Daily treatment may be repeated at 24-hour intervals for up to 8 consecutive days. When Pirsue is used daily for up to 8 days, it is important to use it only in the quarters known to be infected and do not treat uninfected low SCC quarters of the same cow. Pirsue's product insert specifically warns that even with adequate teat end preparation and sanitation, repeatedly infusing the same quarter with antibiotics can sometimes result in elevated somatic cell counts and/or clinical mastitis that is most often due to infection with Gram (-) environmental organisms. If acute clinical mastitis (visibly abnormal milk) or other clinical signs of illness (fever, redness, swelling of the quarter) develop during extended therapy with Pirsue®, discontinue therapy immediately and contact your veterinarian. Milk taken from animals during treatment and for 36 hours after the last

treatment must not be used for human food. Pre-slaughter withdrawal is 9 days if infused only twice in a 24-hour interval but is extended to 21 days if extended therapy is used.

It is crucial to work with your veterinarian to first determine what organism is causing mastitis in order to choose the most appropriate drug and duration of antibiotic therapy. Although culture results are rarely available quickly enough to use, those results will definitely help determine what type of mastitis you are dealing with on your farm and help make decisions regarding treatment of future cases of mastitis. A milk culture may be performed to grow and identify the organism in a laboratory and determine the most appropriate antibiotic for treatment. Unfortunately, for the culture to detect a mastitis organism, there must be a minimum number of bacteria present in the sample. Shedding rates vary widely and *Staphylococcus aureus* is one bacteria that frequently shows low or intermittent shedding rates (below the detection limit). A “no growth” laboratory result could mean the cow has recovered or she may be shedding bacteria below the detection limit but still has the disease (see illustration). One tactic to compensate for this problem is simply to repeat the culture, especially in cows with persistently elevated somatic cell counts. Although this may seem like a waste of money and time, ultimately culture results are invaluable to identify the important contagious mastitis organisms including *Staphylococcus aureus*, *Streptococcus agalactia*, and *Mycoplasma*. Healthy cows must be protected from exposure to contagious mastitis pathogens or they risk new infections, high somatic cell counts, and further spread of disease.

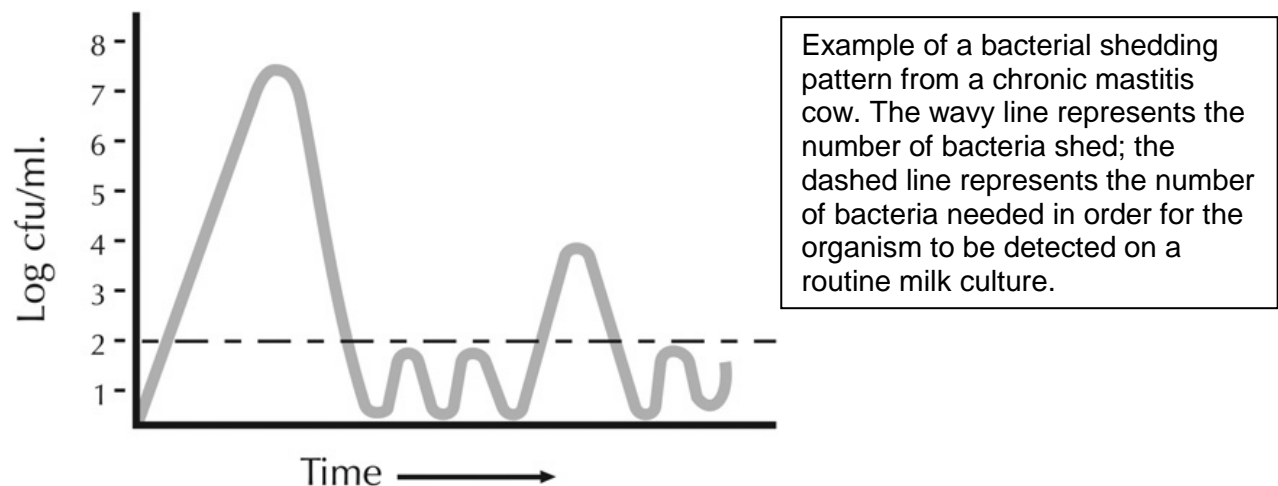


Figure from [Veterinary Clinics of North America Food Animal Practice 28 \(2012\), 187-202](#)