

TREATMENT OF COLIFORM MASTITIS

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For the purposes of establishing appropriate treatment, our recently completed research provides a scheme for distinguishing between different severities of coliform mastitis. A good management plan should always include bacteriologic culturing of the milk to help confirm the nature of the infection and thus the prevalence of specific organisms in the herd. Bacterial cultures are the single best means to accurately diagnose mastitis, and accurate diagnosis is very important in any management plan.

The majority of coliform cases, although acute in nature, are relatively well localized to the mammary gland with only mild whole-body signs of disease. The affected quarter will be warm, firm and swollen with abnormal secretion. These cases are likely to respond to very conservative therapy that includes stripping out the affected quarter with or without oxytocin injection, administration of anti-inflammatory agents, and oral fluid therapy. In these cases use of antibiotics is probably not warranted by either systemic or intramammary routes. More study needs to be done, but these cows virtually all recover without antibiotics, and so antibiotic use can increase treatment cost and risk of residues, without improving outcome. Frequent stripping of the affected quarter is a very important treatment measure, although most large dairies are unlikely to afford the amount of individual cow care that would be most desirable.

Only 10-15% of coliform mastitis-affected cows show severe systemic signs of disease, including significant dehydration, weakness, fever, rumen inactivity, and diarrhea. Our studies suggest that this population of cows may have not only endotoxin release, but greater numbers of bacteria in the gland, plus bacteria in their blood. On this basis, the use of systemically administered antimicrobials should be strongly considered, particularly if the economic value of the cow warrants aggressive treatment. On the other hand, severely affected cows have a poor prognosis, and the decision to treat should be made early. Inadequate treatment is probably a waste of money, and it may be more reasonable to humanely euthanize an affected cow rather than undertreat her. If antibiotics are used, the most effective agents will include cephalosporins, or potentiated sulfonamides. Because the use of aminoglycosides results in extremely prolonged tissue drug residues, their use is strongly discouraged.

Fluid therapy is very important for severely affected cows. Because these cows' rumen is not working, oral fluid therapy will not be much benefit. Intra-venous fluid therapy, on the other hand, is one of the most effective treatments for endotoxic or septicemic shock. Administration of small volume hypertonic saline (7.5% sodium chloride solution at 5 ml/kg) may be a reasonable alternative to administration of large volume intravenous fluids.

Numerous studies have shown benefit from the use of anti-inflammatory agents in combating the systemic signs of coliform mastitis.

Our current understanding of the pathogenesis of coliform mastitis suggests that disease signs are primarily due to the effects of endotoxin. One important implication is that the bacterial invasion is restricted to the mammary gland and that treatment is directed at clearing the organism from the gland, with little concern about bacterial invasion and resultant bacteremia/septicemia. Evidence supporting this notion comes from experimental trials with inoculation of coliform organisms into the gland and from one field trial of natural cases that failed to demonstrate bacteremia in a series of 20 affected animals. The significance of the conclusion that bacteremia does not occur with coliform mastitis is that systemically administered antibiotics are not directed at clearing the organism from the bloodstream or nonmammary tissues. Studies we have recently completed disagree with these findings, as we have isolated coliform organisms from the blood of approximately one-third of cows affected with the severe systemic form of this disease. This finding suggests that systemically administered antibiotics may be very important in helping to control multisystemic disease that results from coliform mastitis.