

## **UDDER HEALTH AND MILK QUALITY**

### **Problem Solving: Clinical Mastitis II--Diagnosis**

The previous column outlined some clinical mastitis treatments indicated for specific mastitis-causing organisms. Before applying any of these treatments to an individual cow with clinical mastitis, the dairyman must try to identify the causative agent. Sometimes we can identify the organism simply by noting its effects on the cow; the variation in clinical signs is mainly determined by the organism infecting the gland. However, different individual cows may react very differently to an infection with the same organism. Here are three fairly safe rules of thumb for cow side mastitis diagnosis:

- 1) If a cow has a thin serum-colored secretion from a swollen firm quarter and is showing such signs of toxemia as fever, depression, diarrhea, and weakness, there is about a 70% chance that she has an infection due to *E. coli*. As described previously, the treatment goal is to reduce the effects of the endotoxins released during the infection--fluid therapy, anti-inflammatory drugs, stripping to remove the toxins.
- 2) If a cow has a thick, gelatinous, white or greenish secretion (i.e. pus), especially if accompanied by a foul smell, the infection is very likely due to *Actinomyces pyogenes*. Systemic penicillin and drainage of the affected quarter are indicated.
- 3) If a cow has a watery white or yellow secretion with clots or flakes, with or without a swollen quarter, but is not systemically ill, any one of a dozen organisms (including streps, staphs, and coliforms) could be responsible!

This last rule applies to the vast majority of clinical cases, and herein lies the great dilemma in clinical mastitis treatment. The protocol on many dairies requires that these mild cases be treated with intramammary antibiotics. Is this appropriate? If these infections are due to the streptococci or staphylococci (referred to as Gram-positive organisms by bacteriologists), antibiotic infusions are probably indicated. However, if the infections are due to the coliform type (Gram-negative) organisms, antibiotics are useless. If we knew that the latter was the case, a great deal of money could be saved by not using antibiotics. As the basis for any decision-making, I strongly recommend that a milk sample be collected and cultured from 10-15 cases of clinical mastitis. The culture results will reveal the pattern of mastitis-causing agents in the herd. I suggest that this culturing be repeated any time a new outbreak of clinical mastitis appears. In a previous column, I defined a clinical mastitis "outbreak" as the occurrence of clinical mastitis in greater than 3-5% of the milking herd per month. If the vast majority of these cultures reveal coliform organisms, antibiotic treatment is unnecessary. However, if Gram-positive organisms (streps and staphs) are frequently found, intramammary antibiotics are indicated.

Recently, a mastitis culture kit--the Hy-Mast Test--has been made available and is being aggressively marketed to dairy producers. The goal of the test is to provide a fairly quick (24 hour) and inexpensive differentiation between the Gram-negative (coliform) and Gram-positive bacteria responsible for mild clinical mastitis that is so difficult to

differentiate at cowside. Since these cases are not life-threatening, treatment decisions can safely be delayed until the test results are obtained. In tests at the University of Guelph in Canada, the Hy-Mast Test compared very favorably to laboratory culture methods when coliform bacteria were the causative agents. However, the Hy-Mast Test detected about 40% more Gram-positive infections than indicated by the lab culture methods. At present, we don't know whether these are false-positive Hy-Mast Test results, or whether the Hy-Mast Test is actually more sensitive for Gram-positive infections than the lab culture methods! I feel that the test is worth trying unless future research indicates otherwise. If the test indicates the presence of coliform organisms, one can be at least 90% confident that the test is correct and antibiotics can safely be withheld. If Gram-positive bacteria are indicated by the Hy-Mast Test, it is recommended that intramammary antibiotics be used.

Record-keeping is an extremely important aspect of clinical mastitis management. Keep track of the number of cases and the organisms responsible so that you can detect a change in the pattern and incidence. To prevent antibiotic residues from appearing in bulk tank milk and in tissues of cull cows, all treatments must be recorded. Such records should include the cow identification, dates of treatment, quarter(s) treated, results of any antimicrobial residue tests, and the last date of milk and slaughter withholding. Treated cows should be marked with leg bands or other methods and kept in separate pens until their milk can be sold.