Mastitis Diagnosis

Most new mastitis infections occur during the first 10 days and last 2 weeks of the dry period, with most of the resulting cases of clinical mastitis appearing immediately after calving. It is important to recognize both clinical and subclinical cases so they can be treated immediately.

Clinical Mastitis

Clinical mastitis is defined as the production of abnormal milk with or without secondary symptoms such as swollen quarters, elevated body temperature and/or other systemic signs. Although clinical infections are rarely apparent prior to calving, routine observation for abnormal swelling is important. Normal prepartum udder secretions range from a honey-like appearance to normal milk. Clinical mastitis can be recognized in pre- and post-calving secretions, colostrum or milk by the presence of gargot (clots and flakes), abnormal texture or discolouration.

It is extremely important to obtain an aseptic milk sample from all clinical mastitis quarters (prior to giving any antibiotics) for bacterial identification. An achievable goal should be < 5% of animals freshening with clinical mastitis.

Subclinical Mastitis

Somatic Cell Counts (SCC). Subclinical mastitis is more difficult to detect because the milk appears normal but the SCC is elevated and bacteria may be present in the milk. There is no absolute threshold of SCC that defines the occurrence of subclinical mastitis but it is highly likely that an animal with a SCC of >200,000 cells per ml post-calving has mastitis. It is important to recognize that DHI SCC values are from milk that is comingled from all four quarters. Single quarter infections may not be apparent until the SCC level in the infected quarter is very high. An achievable goal is <10% of animals with SCC of 200,000 or greater at first post-calving test. Since DHI SCC cannot delineate whether problems occur pre- or post-calving, it is imperative to incorporate another evaluation tool, such as the California Mastitis Test, as soon after calving as possible.

Incidence of new and clinical infections during the dry and lactation periods.

California Mastitis Test (CMT). The California Mastitis Test (see page 15) can be used postpartum to identify quarters that are likely to be and/or have been infected. Approximately 55-80% of major mastitis infections will be CMT positive during the first week postpartum. All quarters with CMT reactions of trace or greater should be suspected of subclinical mastitis. However, the CMT should be interpreted cautiously because, although the slightest amount of thickening indicates the presence of a high SCC, only about 20-40% of CMT positive reactions are associated with culturable major mastitis pathogens. In many cases, the infection has been cured but SCC has not returned to baseline values. Treatment based solely on CMT results (especially without knowledge of predominant mastitis organisms in the herd) will result in many uninfected quarters being treated.

The likelihood that a negative CMT is associated with an uninfected quarter is greater than 90%. Therefore, the most accurate use for the CMT test is to confirm negative quarters, as well as to confirm that mastitis control programs are working. When higher percentages of CMT positive quarters and animals are seen, CMT positive quarters should be cultured to determine causative organisms.

Many producers are reluctant to use the CMT because they assume it is time consuming and all cows inevitably have high SCC the first week post calving. These are myths! The CMT is simple and easy to run, takes about 1 minute, and costs pennies. In a well managed dairy with excellent mastitis control, fewer than 10% of cows and 5% of quarters should be CMT positive.
Bacterial isolation and identification. Microbiologic exam of milk samples obtained from suspect quarters or clinical mastitis is a standard diagnostic procedure. It is extremely important that samples obtained for culture, especially during the precalving period, are obtained under the strictest hygienic conditions so infections aren’t inadvertently introduced during the sample collection process. Teats should be thoroughly cleaned (teat dipped and dried), then disinfected with alcohol swabs prior to collecting a milk sample into a sterile container. Samples should be refrigerated immediately or frozen. Differences in sample collection technique, in shedding patterns of bacteria and in laboratory procedures make the interpretation of microbiologic results imprecise. The isolation of mastitis-causing bacteria from milk samples or secretions obtained from the udder prior to calving is highly suggestive that a quarter is infected with mastitis. However, the lack of bacterial growth from a single composite or quarter milk sample is not always useful.