

Northwest Veterinary Associates Newsletter

“That’s not just old milk”

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by Dr. Kokaram

With the recent weeks of wet weather we have seen a notable increase in the number of mastitis cases being dealt with on farm and cultured here at the office. Given the current dairy economy where each pound of milk is precious cargo combined with the average cost of clinical mastitis estimated at costing roughly \$179 per case, I thought perhaps a bit of a quick review of mastitis risk factors and control may be warranted for all of us. Mastitis generally develops when the exposure of the teat end to bacteria exceeds the ability of the teat end defenses to resist infection. The greatest risk of exposure tends to occur during the first three weeks of the dry period and immediately following calving. So the infections we are seeing now in our fresh cows may have occurred as far back as her dry off date two months prior.

This increased susceptibility to mastitis pathogens is as a result of a variety of factors such as the enhanced gland pressure leading to milk leakage and as thus easier bacterial access through the teat canal; decreased local immune reactivity; and reduced flushing effect of milking on bacteria present in the mammary gland following dry off. The streak canal tends to become shorter during the dry period as well and the keratin plug in the canal that ought to act as a physical barrier to infection takes some time to develop (up to six weeks in some higher-producing milking animals). Following dry off, there is enhanced bacterial growth and exposure on the teat skin and streak canal; this coupled with the lack of a good keratin plug and a shorter canal leads to a significantly increased risk of infection.

In terms of additional risk factors, there has been shown a notable effect of age on relative risk of both subclinical (SCC less than 200,000) and clinical mastitis (SCC over 200,000). In general, individuals in their third or greater lactation tend to show greater rates of infection relative to those in their second lactations. Additionally, a prior history of mastitis in the previous lactation has also been shown to be a very important risk factor for the development of mastitis in the current lactation with cows having at least one case of mastitis prior to dry-off being four times as likely to develop mastitis in the current lactation. Furthermore, cows with chronic high SCC (scores over 200,000) at dry off and freshening have an increased chance of developing mastitis within the first 120 days of the next lactation.

So we know when and why these infections are occurring; but do we intervene so we can avoid said infections from occurring or recurring; as the case may be? Since proper dry cow management influences a cow's susceptibility to infection in the next lactation, use of dry antibiotic therapy is very important. Dry cow therapies initially were designed for control of subclinical *Staph. aureus* and *Strep. ag.* infections. However, recent studies have shown significant benefit for the control of subclinical infections caused by environmental pathogens as environmental streps, coliforms, etc. Given the time frame required for development of the keratin plug in some individuals, use of an internal teat sealant would also reduce the chance for bacterial exposure of the streak canal and thus the quarter. In the fresh cow, use of post-dips that tend to cling to the teat surface longer tend to help reduce the population of the skin surface with bacteria during lactation.

Vaccination for mastitis is also a vital aspect of mastitis prevention/control on the farm. Infections with gram-negative bacteria such as coliforms tend to produce a much greater milk loss than the gram-positive bacteria like *Strep* for example. Thus, vaccinating animals according to label directions with an appropriate vaccine for gram-negative species of bacteria ought to significantly reduce the chance for infection during the pre-fresh and dry period, if not reduce the secondary effects of said infections in the next lactation as well. However, vaccinations and dry cow therapies will do very little to reduce the chance of infections if cows are

housed in unsanitary conditions or are significantly over-crowded. Situations where dry cows (far-off and close-up) and fresh cows are housed in wet or unclean facilities lend themselves to increased bacterial exposure of the teat ends thus allowing for increased incidence of infection.

Just as some cows are at increased risk for mastitis based on conformation, previous history, etc, treatment of said infections is also fairly farm and/or species specific in terms of what intra-mammary therapy to use and whether or not to even treat said infection at all. In general, infections due to coliform bacteria do not typically clear with antibiotic therapy alone, while environmental strep infections often only respond to treatment 60%-70% of the time and infections due to other bacteria like *Pseudomonas* do not respond at all. As such, therapy, and response to therapy, is very much specific to the actual pathogen causing the infection; highlighting the need to culture individual quarter infections if not doing routine bulk tank cultures to have a sense of what pathogens are currently in the herd at that time. Regular consultations and follow-up with your herd veterinarian should help with streamlining your treatment protocols to suit the needs of your farm.

As we've outlined above, control and prevention of mastitis infections needs to focus on the animals most at risk; cows in the first three weeks of the dry period and immediately following calving. Reduced milk flushing, decreased local immune function, shortened streak canals, inadequate keratin plug formation, increased quarter pressure allowing for milk leakage, increased overall bacterial growth and population of teat skin and canal all contribute to the enhanced susceptibility during the dry period. Lactation number, prior mastitis history, SCC at dry off and freshening are all good predictors of relative risk of infection. Regardless of the tomes of research done on the incidence of mastitis and treatments however, dry cow therapy, sound vaccination protocols and sanitation still remain the hallmarks of a good mastitis management strategy.