



# MASTITIS PREVENTION AND TREATMENT IN DAIRY GOATS

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**M**astitis, inflammation within the mammary gland (udder), can have vast impacts the long-term health and longevity of affected animals as well as the income of dairy producers. Financial losses can be incurred directly via decreased milk production and cost of antimicrobial treatments. Indirect costs must also be considered such as time and labor to treat clinical cases, long-term decreases in production, culling and replacement costs, wasted milk, and loss of production bonuses due to elevated bulk tank somatic cell counts. Some sources estimate production decreases of up to 70% in goats with clinical mastitis while subclinical mastitis can result in up to 32% production loss compared to unaffected goats. Bovine studies also demonstrate that udder health has a direct impact on an animal's longevity within a herd and that increased incidence of elevated somatic cell count is one of the top reasons for involuntary culling in the American dairy industry. With animal health and the producers bottom line at stake, what other reasons do we need to take a closer look at our goats' udder health?

Clinical mastitis is defined as an inflammatory response causing visibly abnormal milk. This may include blood and fibrin clots along with visible abnormalities of the mammary gland such as heat, redness, discomfort, and swelling. Causative agents of clinical mastitis are generally discussed in two different groups: Environmental pathogens and contagious pathogens. Environmental pathogens, as

the name suggests, are contracted through the living conditions of the animal – such as dirty bedding. Common environmental pathogens include *Streptococcus species*, *E. coli* and *Klebsiella species*. Goats are exposed to these daily, no matter how clean the environment is kept. *E. coli* and *Klebsiella species* are less commonly identified in goats than dairy cattle, however they can be challenging to manage

should an outbreak occur as they are generally not responsive to intramammary antibiotic treatments that are currently approved for use in the United States.

Contagious pathogens are those that are transmitted from the mammary gland of an infected animal to an uninfected animal. The most common and severe contagious pathogen known to cause clinical mastitis is *Staphylococcus aureus*. Other common causes of clinical mastitis in goats include *Streptococcus species* and *Mycoplasma agalactiae* (the primary cause of contagious agalactia). Contagious mastitis is generally spread via milking equipment, due to poor pre-milking hygiene, or ineffective post-milking procedures. Liner slips—that squeaky, honking noise produced by the milking unit—also provide optimal conditions for introduction of pathogens into the teat because this indicates that the liner is not effectively covering the teat and outside air is being allowed to slide into the milking unit, carrying with it bacteria. Squeaky liners should be replaced immediately, not re-manuevered.

Identification of the offending



pathogen is the first step in developing a plan of attack during an outbreak of clinical mastitis. This requires aseptic collection of milk from affected does and culture at a veterinary diagnostic laboratory. Your veterinarian is trained in how to collect these samples and can help to ensure that samples are not contaminated during the collection process as this can impact the usefulness of this testing. Based on the results of culture information, your veterinarian can help you develop a plan to control the spread and manage infected does. This may include the use of intramammary antibiotics, culling animals infected with certain pathogens, or milking infected animals at the end of a shift to prevent spreading pathogens to healthy members of the herd.

Subclinical mastitis can be much more difficult to detect and address as clinical signs – such as abnormal milk and changes to the udder – are not present. This condition occurs when infection in the udder produces inflammation resulting in an elevated somatic cell count. The most common group of pathogens to cause subclinical mammary disease are termed ‘coagulase negative *Staphylococci*’. These are also considered to be environmental pathogens. Research projects involving whole-herd cultures at dry off show that the rate of subclinical mastitis may be 33% or higher in dairy goat herds by the end of lactation. Subclinical infections that are not addressed during the dry pe-

riod can result in clinical mastitis during the subsequent lactation or may continue to incite low-grade inflammation of the udder resulting in decreased milk production along with fat and protein compared to uninfected animals. Though more insidious than the clinical disease form, subclinical mastitis is no less effective at chipping away at the health and productive longevity of goats while also negatively impacting the dairymen’s bottom line.

As should be evident by now, subclinical infections are impossible to detect through gross examination of goats or milk. This leaves dairymen with a challenging question: how do we know if we have a problem? Whole-herd cultures are impractical due to cost and time consumption. Goat-side tests such as the California Mastitis Test may have limited use, however detecting subclinical infections with this diagnostic method is unreliable in our experience. Individual animal somatic cell counts can prove exceptionally useful and more cost-effective than herd-wide cultures, however this data must be collected on a routine basis to determine whether elevated counts are due to normal changes that occur during lactation or indicate an infectious problem. Unlike cattle or sheep, goats experience significant increases in their somatic cell count as lactation progresses simply due to their normal physiology (see Figure 1). This makes tracking somatic cell count throughout an animal’s lactation essential to detecting sub-

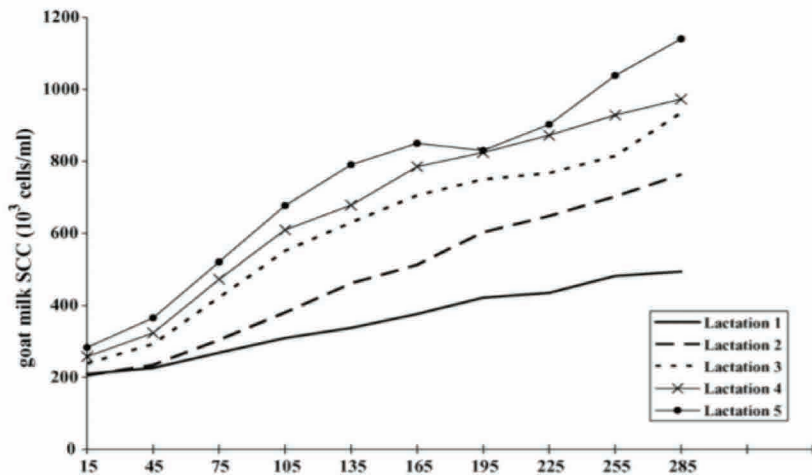


Figure 1 - Paape, M.J., et al (2007). Monitoring goat and sheep milk somatic cell counts.

clinical mastitis. If a producer were only to test animals occasionally, they would have no understanding of whether an elevation in somatic cell count was part of the animal's regular pattern or if it was an indicator of a potential problem. The current recommendation to perform somatic cell evaluations on each individual animal every 3-4 weeks throughout the lactation. This can be most easily accomplished through routine Dairy Herd Improvement (DHI) testing which aligns with the American Dairy Goat Association's Dairy Herd Improvement Registry (DHIR). Producers may elect to have a full-service test done monthly by a certified DHI-certified testing supervisor or can self-submit samples depending on whether or not they participate in the DHIR program. Regardless of sample collection method, DHI provides producers with electronic records of each test day's data which allows tracking of individual animal and whole-herd data throughout the year. This is the most effective method of evaluating trends in somatic cell counts as well as milk production and component levels. Not only is this valuable for detecting subclinical mastitis events but it can also assist producers in management decisions based on other production metrics.

While subclinical mastitis may seem like a daunting hurdle in the quest for improving milk quality, it is a project that many producers ad-

dress head on with the help of their veterinarian. Many dairies (both bovine and caprine) utilize a "blanket dry therapy" approach where all animals are treated with intramammary antibiotics at dry off to mitigate any subclinical infections that may be present and prevent development of new infections during the dry period. Other producers utilize somatic cell count data as well as health information from the current lactation to determine which animals are most likely to be harboring subclinical mastitis and make decisions about targeted intramammary antibiotic use. At Iowa State University, we are currently working to establish meat and milk withdrawal data for therapy with dry cow intramammary tubes. Subsequently, we will be determining the efficacy of dry off therapy and determining the risk for development of antimicrobial resistance.

Whether you have been battling clinical mastitis or if you are looking to improve the quality of the milk that leaves your farm, having records of health events and treatments administered as well as DHI data is essential for a thorough evaluation of your herd. Your veterinarian can help you condense and utilize this data to develop a plan to improve the health of your animals and the quality of milk that your farm produces. ■