



Mastitis: A most significant diseases of dairy animals

VP Singh¹, Brij Vikas Singh², RK Singh³ and AK Singh⁴

¹SMS-Animal Science, ³SMS- Agriculture Extension, ⁴SMS Agronomy
Mahayogi Gorakhnath Krishi Vigyan Kendra, Gorakhpur, U.P.

²SMS-Animal Science, KVK Auraiya, U.P.

Introduction

Mastitis, or inflammation of the mammary gland, is the most common and the most expensive disease of dairy cattle throughout most of the world. It is a major problem that causes massive economic losses on most dairy farms. Although stress and physical injuries may cause inflammation of the gland, infection by invading bacteria or other microorganisms (fungi, yeasts and possibly viruses) is the primary cause of mastitis. Infections begin when microorganisms penetrate the teat canal and multiply in the mammary gland. It usually occurs as an immune response to bacterial invasion of the teat canal by variety of bacterial sources present on the farm (commonly through bedding or contaminated teat dips), and can also occur as a result of chemical, mechanical, or thermal injury to the cow's udder.

Mastitis is a multifactorial disease, closely related to the production system and environment that cows are kept in. Mastitis risk factors or disease determinants can be classified into three groups: host, pathogen and environmental determinants.

There is a large cohort of microorganism species that are known to cause mastitis. These range from virus, mycoplasma, fungus and bacteria. Bacterial organisms known to cause mastitis are *Pasteurella multocida*, *Staphylococcus aureus*; *Str. Zooepidemicus*; *Str. agalactiae*; *Str. pyogenes*; *Str. faecalis*; *Mycobacterium bovis*; *Klebsiella* spp; *Brucella abortus*; *Pseudomonas pyocyaneus*; *E. coli*; *Leptospira Pomona*, etc. Fungal entities responsible for mastitis are *Aspergillus fumigatus*; *A.midulus*; *Candida* spp; *Trichosporon* spp, etc.

Physical injury to the mammary region, poor hygiene and/or trauma, also cause this condition.

Early Detection of Mastitis in Cows

Early detection of mastitis in cows enables you to limit the spread of infection within your herd, minimise the impact on your bulk milk quality, and improve treatment success. Undetected mastitis infections can spread between quarters and cows through milking machines and udder handling by staff. Infected cows that are not detected or don't receive the appropriate treatment can develop chronic long-term infections that lower production, and increase the risk of lower sale values and culling. It only takes a few infected animals to lower your milk quality by increasing the bulk milk somatic cell count, especially during calving or in late lactation when fewer cows are contributing to the vat, or if you have a small herd. A high bulk milk somatic cell count can lead to penalties from your dairy company and a lower pay out.

Symptoms

The clear sign of mastitis is inflammation of the udder that turns into a red and hard mass. The swollen mammary gland is hot and the mere touching causes pain and discomfort to the animal. Animals do not allow touching of the udder even kicking to prevent milking. If milked the milk is usually tainted with blood clots, foul smelling brown discharge and milk clots.

The milk yield totally stops or is severely restricted. Body temperature of the animal increases. Other symptoms are lack of appetite, hindrance in mobility due to swollen udder and pain. The dairy animal develops sunken eyes, suffers from digestive disorders and diarrhoea. Infected cattle are severely dehydrated and suffer from weight loss.



In cases of severe infection there is formation of pus in the infected udder. Mastitis can degenerate to Toxaemia or Bacteraemia and even cause death as a result of acute infection.

Mastitis can be detected at an early stage (sub clinical) before the symptoms appear, through California Mastitis Test (CMT). It is



a quick test that can be performed on small milk samples. Early detection helps in preventing the progress of the disease into clinical stages and causing heavy losses to dairy farmers.

Prevention

It is better to prevent mastitis before it becomes a problem. The below measures can go a long way in prevention:

- Provide clean, dry and adequate bedding for cows to lie
- Cows should be clean while entering the milking area
- Use different cloth or paper towel for cleaning the teats on each cow
- Teats should be completely dry and clean before milking
- Use germicidal teat dips after milking
- Feed the cows after milking so that they don't lie down immediately. This prevents the entry of microorganisms into teat canals that are still open from milking.

Treatment

- Success depends on the nature of the aetiological agent involved, the severity of the disease and the extent of fibrosis.
- Complete recovery with freedom from bacterial infection can be obtained in cases of recent infection and in those





where fibrosis has taken place only to a small extent.

- Such drugs as acriflavine, gramicidin and tyrothricin have now ceased to be in use, and have given place to the more effective drugs, such as sulphonamides, penicillin and streptomycin.

Conclusion

Mastitis is a major problem that causes massive economic losses on most dairy farms. When optimising farm management does not result in a significant reduction of the animal udder health status. Use of antibiotics in food-producing animals does contribute to increased antimicrobial resistance in dairy cattle and farm environments. Antimicrobial resistance among dairy pathogens, particularly those bacterial strains that cause mastitis in dairy cattle, is not increasing at alarming rate. Use of antibiotics for maintaining animal health and productivity based on preventative measures, such as improved nutrition, environmental sanitation, use of teat sealants, and selection for disease resistance genetic traits together with advances in more rapid pathogen detection and characterization systems will undoubtedly play an integral role in strategies aimed at improving dairy productivity with improved safety of dairy products for human consumption.

