Extension Folder No. 59

MASTITIS IN DAIRY COWS

Approaches towards combating zoonotic and foodborne infections through community participation

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Good husbandry practices promotes good health and efficient production from livestock. Thus, a complete and holistic approaches are essential where maintenance of appropriate environment (both internal and external) is required. In spite of the good husbandry practices, mastitis in dairy animals is inevitable. However, good managemental practices like housing, nutrition (clean water and wholesome food), general hygiene, good record keeping, parasite control, complete vaccination and deworming programme will reduce the incidence of mastitis.

Mastitis (Greek, Mastos =breast + it is = inflammation) is a multietiological complex disease, which is defined as inflammation of parenchyma of mammary glands and is characterized by physical, chemical and usually bacteriological changes in milk and pathological changes in glandular tissues. In short mastitis is the persistent, inflammatory reaction of the udder tissue. This is the most common disease in dairy cow causing heavy economic losses to the farmers. Annual losses due to clinical and subclinical mastitis (SCM) has been reported to be Rs. 6053.21 crores in India. As per 2006 estimates referred in ICAR's National Agricultural Innovation Project, the estimated annual loss due to mastitis alone is nearly Rs. 16,702 millions. If one quarter is affected 25% milk yield is lost permanently. It may also spread to other quarters also, hence it causes major economic losses to the farmer. High yielding animals are more prone to this condition, if not milked properly. In our survey in Goa, it was observed that 60% milk samples were positive for subclinical mastitis and 80% milking animals showed one or more quarters to be infected.

Etiology

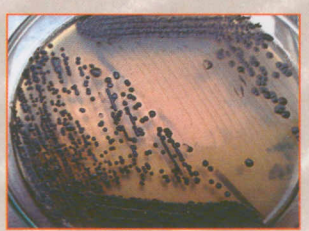
There are 137 species and subspecies of microbes that can be associated with the mammary gland of the cow. Several of them are part of the normal flora and, with few exceptions, do not cause mastitis. On the contrary, they may protect udders from infection caused by pathogenic bacteria. Infectious micro-organisms and milk static are the leading causes of mastitis.

Some of the causes of mastitis are as follows....

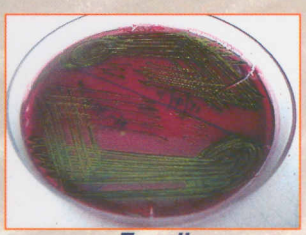
Physical agents : biting by calves, insects, kicking

Chemical agents : acids, alkali, phenol etc.

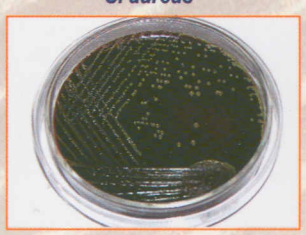
Microbial agents : Many bacterial agents especially *Staphylococcus* spp., *Streptococcus* spp., *Bacillus spp.*, *E. coli*, *Klebsiella* spp. and *Mycoplasma* spp. Rarely *M. tuberculosis*, *Candida* and *Cryptococcus* are involved.



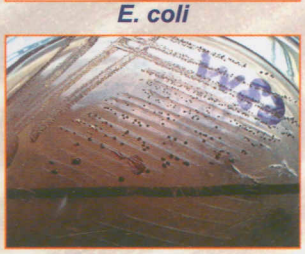
S. aureus



E. coli



L. monocytogenes



Streptococcus spp.

Sources of pathogens for mastitis

The factors which contribute to the causation of mastitis includes...

1. Contamination by milker's hands, utensils contaminated floors and clothes.
2. Presence of high population density of the causative bacteria in milking shed.
3. Damage to the teat sphincter
4. Udder infected with FMD, Pox virus.
5. Physical trauma that may accelerate the growth of the causative bacteria.
6. Sawdust and shaving used as bedding, which are harbouring *E. coli*.
7. Edema and congestion of udder during parturition.
8. Poorly designed housing, uneven faulty surface
9. Dirty milking machine

Environmental Factors

Climate : intense cold, draughts, excessive humidity or heat

Housing: Mastitis is less common with loose housing systems than with tied housing systems

Bedding: humidity favours the development of microbes on bedding

Stress: More stress, greater chance of mastitis.

Genetic factors: Dairy cattle breeds are not equally susceptible to mastitis. High yielding cows are more likely to be affected. Hereditary factors account for 12% to 20% of susceptibility to mastitis in a single breed.

Nutritional Factors: Rapid changes in diet and excess or imbalance in the different components of rations favours mastitis.

Silage and hay: Cows fed with hay and grain have greater resistance in every way to several pathogens than cows fed with silage.

Selenium and vitamin E: Maintaining an adequate level of selenium and Vitamin E in the system helps to prevent mastitis.

Symptoms: In clinical mastitis, udder becomes red, painful, swollen and hard, sometimes fever, malaise and nipple fissure also noted. Taste and appearance of milk changes. Milk contains flakes, blood stain particles, pus, mucous etc.

However, in subclinical mastitis milk appears to be normal. There are no changes in the consistency of milk but the milk production goes down.

Changes in Milk

Redness

Swollen udder

Microbiological Investigation: California Mastitis Test (CMT) is performed for detection of subclinical mastitis at the farmers field. For this, equal amount of milk and reagent need to be taken in the paddle and mixed it gently. If the clumping/ clotting of the mixture takes place then it is indicative of positive test for mastitis. These positive milk samples need to be collected and used for isolation and identification of the bacterial pathogens followed by antimicrobial sensitivity test (AST).

California Mastitis Test

Antibiotic Sensitivity Test

Treatment

Pendistrin	- Intra-mammary
Mammital	-Intra-mammary
Tilox	- Intra-mammary
Cobactan	- Intra-mammary
Erythromycin	- 250 – 500 mg 6 hourly – I/M
Flucloxacillin	- 250 mg 6 hourly – I/M
Cloxacillin	- 125-500 mg 6 hourly by mouth
Amoxicillin	- 250-500 mg every 8 hours– I/M
Cephalexin	- 250-500 mg 6 hourly – I/M

Combination of Betamethazone and Gentamycin – Intramammary

Note: Mastitis infected animals need to be treated with intramammary infusions while intramuscular preparations used to control secondary infections and also for treating mastitis.

Prevention and Control

* Complete removal of milk during milking
* Cleaning of teats before and after milking
* Application of tincture iodine or antiseptic on teat opening after milking
* Thorough and frequent hand washing by soap and antiseptic lotions
* Udder massage, lotions, ointments and sprays like *Boracic lotion, Dettol 2.5%, penicillin ointment, chlorhexidine (0.2%), Hypochlorite solution* etc.
* *Mastilep (Ayurvedic) - best ointment for prevention*
  5 days after parturition to at least for 3 months
* Farm premises cleaning by 1-2% potassium permanganate or cresol
* Use of selenium and Vitamin E.
* Proper cleaning of utensils by detergents
* Proper shelter, space, feed and water
* Separation of diseased animals from healthy stock
* Decontamination of utensils, farming materials, feed and premises.

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