SFMT (Surf Field Mastitis Test) – A Diagnostic Method for detection of Sub clinical mastitis in Dairy Animals

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Bovine mastitis is an inflammatory response of the udder tissue in the mammary gland caused due to physical trauma or microorganism infections. It is considered the most common disease leading to economic loss in dairy industries due to reduced yield and poor quality of milk. This disease not only reduces the milk production potential of the dairy animals (to the tune of 20 to 25%) but the milk produced by the affected animals is also unfit for human consumption. Annual losses in the dairy industry due to mastitis was approximately 526 million dollars in India, in which subclinical mastitis are responsible for approximately 70% of these losses. This is partly because at the very least, every one out of five Indian cow and buffalo is affected with bacterial infection of the udder called 'mastitis'.

Mastitis

The infectious agent enters through the milk canal, interacts with the mammary tissue cells and multiplies. The mammary tissue reacts to these toxins and becomes inflamed. The infection rate of mastitis in cows with pendulous udder is higher than those having non-pendulous udder.

Bovine mastitis can be classified into 3 classes based on the degree of inflammation, namely clinical, sub-clinical, and chronic mastitis. A clinical bovine mastitis is evident and easily detected by visible abnormalities, such as red and swollen udder, and fever in dairy cow, and the milk of the affected cow appears watery with presence of flakes and clots.

Chronic mastitis is an inflammatory process that lasts for several months, with clinical flare-ups occurring at irregular intervals. Contrary to clinical mastitis, sub-clinical mastitis shows no visible abnormality in the udder or milk, but milk production decreases with an increase in the somatic cell count (SCC). The loss contributed by sub-clinical mastitis is very hard to quantify, but it accounts for more financial losses in the herd than do clinical cases. Subclinical or hidden form of mastitis is 15-40 times more common than the clinical mastitis. Research conducted in India over the past 4 decades has shown that about 25% of cows and 15% of buffaloes are afflicted with subclinical form of mastitis. An early diagnosis of hidden mastitis is imperative to save the udder and prevent transmission of disease producing organisms to other animals in the herd. As subclinical mastitis is antecedent to clinical mastitis, many surf test positive quarter (s) will develop clinical form of the disease in future. It is also important from public health viewpoint in so far as the milk of animals affected with sub-clinical mastitis contains bacteria and their toxins. Therefore, lack of diagnosis of sub-

clinical mastitis is a serious challenge to the dairy industry.

Hence, at KVK, Kalikiri an OFT trial was conducted demonstrating that a 3% solution of a house-hold detergent like Surf Excel can be used for an early farmer's level detection of sub-clinical (hidden) mastitis. This test has been named as Surf Field Mastitis Test.

The desirable features of this innovative mastitis detection test include:

- Compatibility with the technical capabilities of farmers who happen to be mostly illiterate in the developing countries. Owing to a facile nature of the test procedure, even an illiterate farmer can learn to conduct this test within a few minutes.
- Desirable sensitivity (72.81 and 66.22 in cows and buffaloes respectively) of detection with other expensive similar tests like California Mastitis Test and the gold standard of mastitis diagnosis i.e. microbiological examination of aseptically collected milk samples.
- Availability of the required reagent, i.e. Surf Excel Powder in almost every village.
- User's friendly nature of the test.

Procedure of Surf Field Mastitis Test and its interpretation:

- Prepare a 3% solution of the household detergent i.e., Surf Excel. To this end, dissolve 5-6 teaspoonfuls of the Surf Excel powder in ½ liter of ordinary water. Pour this solution into a plastic bottle, apply a lid and place the bottle in a dark place. This reagent is good for about 3 months.
- Collect 10-15ml of milk from each teat in separate container like tea cups. If Surf Field Mastitis Test paddle is available, there is no need to collect milk samples into tea cups as the milk from individual quarters of cow and buffalo can be collected into individual receptacle of this paddle.
- Mix the milk from individual teat and Surf solution (3%) in approximately equal proportions (i.e. add 10-15 ml 3% surf solution).
- Rotate the mixture of milk and surf solution for about 15-20 seconds.
- Examine the mixture for thickening or any other change.

Interpretation

If the hidden form of mastitis (subclinical mastitis) is present in the quarter of udder, the mixture (milk + surf solution) will thicken (i.e. gel formation) within 15 seconds. If the udder is free of subclinical mastitis the mixture remains liquid and there is no thickening of mixture of milk and surf solution.

The milk from surf test positive quarters of udder is not wholesome for human consumption and should be discarded.

Positive for SFMT test

Instructions to the farmers regarding SFMT

- All farmers should conduct Surf Field Mastitis Test on all quarters of all milch animals at fortnightly intervals. In the event of a positive test reaction in one or more udder quarter(s), immediately contact the local veterinarian for treatment and advice on mastitis treatment and control.
- Whenever there is reduction in quarter yield, Surf Field Mastitis Test should be conducted to rule out the possibility of mastitis as the cause of reduced milk yield.
- Lactating animals should be divided into Surf test positive and Surf test negative groups. The Surf test negative group (mastitis free animals) should be milked first because the germs, which cause mastitis are transmitted from mastitis-affected (surf test positive) to healthy animals through milkers' hands at the time of milking.
- Always conduct Surf Field Mastitis Test when purchasing new cows and buffaloes. Purchase only surf test negative cows and buffaloes.
- Milk from surf test positive animals is unfit for human consumption because it contains a lot of germs, their toxins and pus cells (somatic cells) and abnormal milk constituents.

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