

## A FIELD STUDY ON PREVALENCE OF SUB-CLINICAL MASTITIS IN DAIRY COWS IN COIMBATORE DISTRICT, TAMIL NADU

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**Abstract:** The study was carried out to find the prevalence of sub - clinical mastitis in lactating dairy cows reared by farmers at field level in Coimbatore district, Tamil Nadu. Screening for sub - clinical mastitis was done using California Mastitis Test (CMT) kit supplied by De Laval Private limited. In this study a total number of 92 farmers participated in the field level demonstrations on screening for sub - clinical mastitis. Out of 128 lactating dairy cows screened, 77 (60.16%) were positive for sub - clinical mastitis and 51 (39.84%) were negative. Out of 128 lactating dairy cows screened for sub - clinical mastitis, total number of animals with single quarter involvement was 36 (46.75%), two quarters involvement was 22 (28.57%), three quarters involvement was 09 (11.69%) and four quarters involvement was 10 (12.99%). Out of 512 quarters, 141 quarters were positive for sub - clinical mastitis. Out of 141 positive quarters, 35 each of left hind quarter (24.82%) and left fore quarter (24.82%) were positive and 37 (26.42%) right hind quarters and 34 (24.11%) left hind quarters were positive for sub - clinical mastitis. The study revealed that out of 128 dairy cows screened, the prevalence of sub - clinical mastitis was in 77 (60.16%) animals in Coimbatore district.

**Keywords:** Subclinical mastitis, California mastitis test.

### INTRODUCTION

Bovine mastitis is one of the most problematic diseases and continues to have major economic impact on the dairy industry throughout the world (Dodd, 1983). Mastitis is characterized by physical, chemical and bacteriological changes in the milk and pathological changes in the glandular tissue of the udder (Sharma, 2007). It is also defined as inflammation of mammary gland parenchyma, which is caused by bacteria and its toxins (Sharma *et al.*, 2006). The bacterial contamination of milk from affected cows render it unfit for human consumption and provide a mechanism of spread of diseases like tuberculosis, sore-throat, Q-fever, brucellosis, leptospirosis etc. and has zoonotic importance (Sharif *et al.*, 2009).

Sub - clinical infections are those for which no visible changes occur in the appearance of milk or the udder, but milk production decreases, somatic cell count increases, pathogens are present in the secretion and the milk composition is altered. Clinical mastitis is recognized by abnormal milk, varying degrees of mammary gland inflammation (redness, heat, swelling and pain) and with or without illness of the cow (Batavani *et.al.*, 2007). The clinical mastitis can be diagnosed on history and clinical findings but laboratory examinations and field level tests are required to ascertain the sub - clinical mastitis. The prevalence of sub - clinical mastitis has been shown to be 15 to 40 times more than the clinical mastitis (Philpot, 1984) and it forms the basis of herd outbreaks. As no gross abnormality in milk and udder is noticed, sub - clinical mastitis goes unnoticed by the farmers. Therefore, sub-clinical mastitis is considered more important due to negative impact on the economy throughout the world (Subhasree Patnaik *et.al.*, 2013).

Somatic cells are indicators of both resistance and susceptibility of cows to mastitis and can be used to monitor the level or occurrence of sub - clinical mastitis in herds or individual cows. Somatic cell count is a useful predictor of intramammary infection and therefore, an important component of milk in assessment of aspects of quality, hygiene and mastitis control. (Sharma *et al.*, 2011). The California Mastitis Test (CMT) is a simple cow-side indicator of the somatic cell count of milk. It operates by disrupting the cell membrane of any cells present in the milk sample, allowing the DNA in those cells to react with the test reagent, forming a gel (David White *et. al.*, 2005). It provides a useful technique for detecting sub-clinical cases of mastitis.

Since there is no gross swelling of quarters or abnormality of milk, sub-clinical mastitis is recognized by laboratory examination of milk or animal-side tests. The common farmers are not so much familiar with these techniques (Bachaya *et al.*, 2011). So the present study was conducted to find the prevalence of sub-clinical mastitis in dairy cows and to create awareness among dairy farmers in Coimbatore district to prevent the occurrence of mastitis at an early stage.

## **MATERIALS AND METHODS**

### **Selection of Animals and Study Area**

In this study, a total number of 128 lactating dairy cows were screened for sub - clinical mastitis during December 2015 to February 2016 in five blocks—Annur, Perianaikenpalayam, Sarkar Samakulam, Thondamuthur and Pollachi North blocks of Coimbatore district. In this

study a total number of 92 farmers participated in the field level demonstrations on screening for sub - clinical mastitis in dairy cows.

### Detection of Sub-clinical Mastitis

Screening for sub - clinical mastitis was done using California Mastitis Test Kit supplied by DeLaval Private Limited. Milk samples were collected from all the four quarters of lactating dairy cows. The teats were washed properly and first two streams of milk were discarded. Immediately after collection, the samples were subjected to California Mastitis Test. In this test, milk samples from each quarter were collected in a clean CMT paddle. The CMT paddle has four shallow cups marked A, B, C, and D to help identify the individual quarter from which the milk was obtained. About two ml of milk was stripped from each quarter. An equal amount of CMT solution was added to each cup in the paddle. The CMT paddle was rotated in a circular motion to thoroughly mix the contents. The results were read quickly. Visible reaction disintegrated after about 20 seconds. The reaction was scored visually. Positive reactions were indicated by a gelatinous mass that collected near the center of the well as it was swirled. More the gel formation, higher the score. When milk from sub-clinically mastitic quarters was mixed with anionic detergent solutions such as CMT or SFMT reagent, a chemical reaction caused the gel formation (Schalm *et al.*, 1971).

### Reading and Interpretation of CMT Scores

CMT score	Somatic Cell Range	Changes	Interpretation
N Negative	1,00,000	No infection. No thickening of the mixture.	Healthy Quarter
T Trace	3,00,000	Possible infection. Slight thickening of the mixture. Trace reaction disappeared with continued rotation of the paddle.	Sub-clinical Mastitis
1 Weak Positive	9,00,000	Infected. Distinct thickening of the mixture, but no tendency to form a gel. If CMT paddle was rotated more than 20 seconds, thickening disappeared.	Sub-clinical Mastitis
2 Distinct Positive	2.7 million Somatic Cell Count	Infected. Immediate thickening of the mixture, with a slight gel formation. As the mixture was swirled, it moved towards the center of the cup, exposing the bottom of the outer edge. When motion stopped, mixture leveled out and covered the bottom of the cup.	Serious Mastitis Infection
3 Strong Positive	8.1 million Somatic Cell Count	Infected. Gel was formed and surface of the mixture became elevated like a fried egg. Central peak remained projected even after the CMT paddle rotation was stopped.	Serious Mastitis Infection

## RESULTS AND DISCUSSION

A total number of 92 farmers participated in the front line demonstrations on prevalence of sub - clinical mastitis in lactating dairy cows using California Mastitis Test kit. A total number of five blocks of Coimbatore district were covered and 128 lactating dairy cows were screened for sub - clinical mastitis using CMT kit. Out of 128 lactating dairy cows screened for sub - clinical mastitis, 77 (60.16%) were positive for sub - clinical mastitis and 51 (39.84%) were negative (Table -1). Out of 128 animals screened for subclinical mastitis, total number of animals with single quarter involvement was 36 (46.75%), two quarters involvement was 22 (28.57%), three quarters involvement was 09 (11.69%) and four quarters involvement was 10 (12.99%).

Out of 512 quarters from 128 lactating dairy cows, 141 quarters were positive for sub - clinical involvement. Out of 141 positive quarters, 35 each of left hind quarter (24.82%) and left fore quarter (24.82%) were positive and 37 (26.42%) right hind quarters and 34 (24.11%) left hind quarters were positive for sub - clinical mastitis.

Karimuribo *et al.* (2008) reported that the percent prevalence of sub - clinical mastitis in dairy cows were 75.9 when assessed by the CMT and 43.8 when assessed by culture. Also higher incidence of SCM (75.3%) has been reported from India by Devi *et al.* (1997). Argaw and Tolosa (2008) reported the prevalence of sub - clinical mastitis as 89.54 per cent in cows and 63.1 per cent quarters were recorded and the resulting quarter infection rate was 56.70 per cent in Ethiopia which is higher than others. In the sub-clinical mastitis, the most important factor affecting somatic cell count in milk is mammary gland infection (Eberhart *et al.*, 1979; Reneau, 1986). Prevalence of clinical and sub - clinical mastitis was higher in hindquarters than forequarters and among hindquarters, left hindquarters were more susceptible than the right (Khan and Muhammad, 2005).

**Table-1: Frontline Demonstration on ‘Prevalence of Sub – Clinical Mastitis in Lactating Dairy Cows using CMT Kit’**

Date, Place and Block	No. of Farmers Participated	No. of Dairy Cows Screened for Sub- Clinical Mastitis using CMT kit	No. of Positive Cases Quarter-wise				No. of Negative cases
			Single Quarter	Two Quarters	Three Quarters	Four Quarters	
11.12.2015 Perumpathi PollachiNorth Block	24	07	02	02	01	-	02
17.12.2015 Pannimadai P.N.Palayam	20	06	01	-	01	-	04

Block							
07.01.2016 Kaalipalayam 16.01.2016 Arugampalaya m 18.01.2016 Kaalipalayam 01.02.2016 Nava India S.S.Kulam Block	08	76	22	18	07	09	20
09.02.2016 Allapalayam Annur Block	20	15	05	01	-	-	09
11.02.2016 Vedapatty Thondamuthur Block	20	24	06	01	-	01	16
<b>Total blocks- 05</b>	<b>92</b>	<b>128</b>	<b>36</b>	<b>22</b>	<b>09</b>	<b>10</b>	<b>51</b>

## CONCLUSION

The present study was conducted to evaluate the prevalence of sub - clinical mastitis in lactating dairy cows and to create awareness among dairy farmers in Coimbatore district to prevent the occurrence of mastitis at an early stage. The study revealed that out of 128 dairy cows screened, the prevalence of sub - clinical mastitis was in 77 (60.16%) animals. This indicates that around 60 per cent of animals are prone to the risk of mastitis which has an economic impact on the farmers rearing the dairy cows. Further studies should be carried out to identify the causative organisms and antibiotic sensitivity tests to help in prevention and control of mastitis.

## RECOMMENDATIONS

Teats should be clean and washed with an effective germicidal chemical to avoid the spread of mastitis. All the quarters of cows should be treated at drying off stage with antibiotics. Proper milking procedure should be practiced. Mastitic animals should be kept and milked separately. After milking the animal should not be allowed to lie down immediately, because after milking the teat sphincter remains open for some time and if animal lies down at that time there are maximum chances of infection due to contact of teat with un-hygienic places. Regular screening of mastitis should be done. Chronically infected animals, which do not respond to the treatments, should be culled out from the herds. The cases of mastitis can be reduced to an appreciable extent and the production can be increased by adopting following

management measures on priority basis, i. Preventing the calf to cause any injury on teat / udder, ii. Full hand milking should be practiced, iii. Keeping the animals on wet and dirty floors should be discouraged, iv. The floors must be even and properly bedded, v. Non-infected animals should be milked ahead of infected ones vi. Using a simple screening test like CMT, farmers should test the dairy animals before purchasing, if positive, buying such animals should be avoided (Bachaya *et al.*, 2011).

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