

## COATED TRI SODIUM CITRATE MINIMIZES THE PATHOGENS AND MAXIMIZES THE MILK AND MILK FAT IN SUB CLINICAL MASTITIS

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### ABSTRACT

Subclinical mastitis infections affect the dairy producer's bottom line by reducing milk production, decreasing milk quality, and suppressing reproductive performance. Subclinical mastitis can be detected with California mastitis test. Fifty cows of members of Bangalore milk union limited were tested with California Mastitis Test. The positive cows were supplemented with 20 grams of coated tri sodium citrate and observed increase of fat and milk.

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## INTRODUCTION

Subclinical mastitis infections affect the dairy producer's bottom line by reducing milk production, decreasing milk quality, and suppressing reproductive performance. Cows with a high Somatic Cell Count (SCC) indicative of subclinical mastitis on the first milk test have an estimated loss in milk production of more than 1,500 pounds per cow (Kirkpatrick and Olson, 2015). Subclinical mastitis also jeopardizes milk quality, preventing dairy producers from getting those valuable SCC premiums. In addition, it has been shown to increase the number of days open, meaning that producers will have to pay for additional services. Subclinical infection is more likely to be caused by contagious pathogens (AHDB 2016)

Treating mastitis cases at the subclinical level improves the likelihood that infections will resolve before they become clinical, thus minimizing milk production losses and quality premium reductions. Measurement of somatic cell in the milk samples are referred as Somatic Cell Count (SCC).

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. It provides a useful technique for detecting subclinical cases of mastitis. (David et al 2005).

Several authorities tried Tri sodium citrate orally and found satisfactory results (Dhillon, et al 1989, 1995, and, 2013, Renu Gupta et al .,2013 and Ram Bahal Rai et al., 2013).

To improve the bio availability of Tri sodium citrate, to provide energy and to enhance the suppressed milk yield and to minimize pathogenic load in the milk, an attempted is made to find out the effect of coated Tri sodium citrate enriched with a special train of live east in subclinical mastitis cows, after subjecting them to California Mastitis Test. (CMT).

### Material ad Methods:

Ban Mast (a coated Tri sodium citrate powder) was procured form Rathna Biotec, Palamaneru. The CMT kit was procured from Nice Chemicals Private limited. Cochin.

In the month of August 2016, 50 cows of the members of Devanahalli camp of Bangalore Milk Union limited (BAMUL), were screened for California Mastitis Test (CMT) and the positive cows were supplemented 20 grams of Ban mast for 10 days. The supplemented cows were again subjected to CMT. The milk fat and yield were recorded. For each response, analysis of variance (ANOVA) was conducted to determine significant differences among various screening tests done, cure percentage and fat percentage by using the statistical software package Graph Pad Quick Calcs software.

### Results

All the 50 cows reacted for CMT test were found negative after with Tri sodium citrate. The milk yield and milk fat were increased significantly in the supplemented cows.

### Discussion

In the market, fat percentage is indicative of quality of milk. In sub-clinical and clinical cases, fat percentage was recorded  $2.51 \pm 0.04$  and  $2.56 \pm 0.21$ , respectively and after treatment with Tri sodium citrate, it was found to increase  $3.21 \pm 0.04$  (Table 1). It is in close agreement with Singh *et al.* (1998) who also observed that fat content of milk in sub-clinically infected quarters was reduced to  $2.89 \pm 0.78$  g/dl, against normal value of  $3.01 \pm 0.78$  g/dl.

With increasing public awareness of food safety issues, the role of mastitis pathogens as possible zoonotic agents has received due consideration. An outbreak of gastroenteritis in human consumers of unpasteurized mastitic milk with *Campylobacter jejuni* from one herd is documented [Morgan *et al* 1985] *The economic losses are more associated*

*with sub-clinical mastitis which is 40% more prevalent than clinical mastitis (Philpot 1984).*Supplementation of Ban Mast reduced the infection to 4% in positive cows and might have improved mammary health and paved a way to enhance milk fat and milk yield (Table 1 and Figure 1). The low percentage indicates low percentage of infection and efficacy of coated Tri sodium citrate. **(Ashworth, et al., 1967 and Kirkpatrick and Olson 2015).**

The beneficial effect of lipid coated Tri sodium citrate might have protected the supplement from the degradation in the rumen and facilitated for the optimum release of Tri sodium citrate, in the intestines and made it highly bio available and the coated vegetable fat might have provided some energy too to produce more milk.

**Table: 1**

Percentage of infection, Milk fat and yield before and after supplementation of coated Tri sodium citrate in Devanahally Dairy.

No of animals tested for CMT t(1)	Found +v(2)	Found -ve(3)	Milk fat before Treatment(4)	Milk fat after Treatment(5)	Milk yield in (L) before Treatment(6)	Milk yield in (L) after Treatment(7)
50	48	2	3.69	3.81	4.42	4.84
SD			0.30	0.26	0.83	0.9

Serial number 5(Fat Percentage) over 4 is significant and serial number 7(Milk Yield) over serial number 6 is significant at 5% level

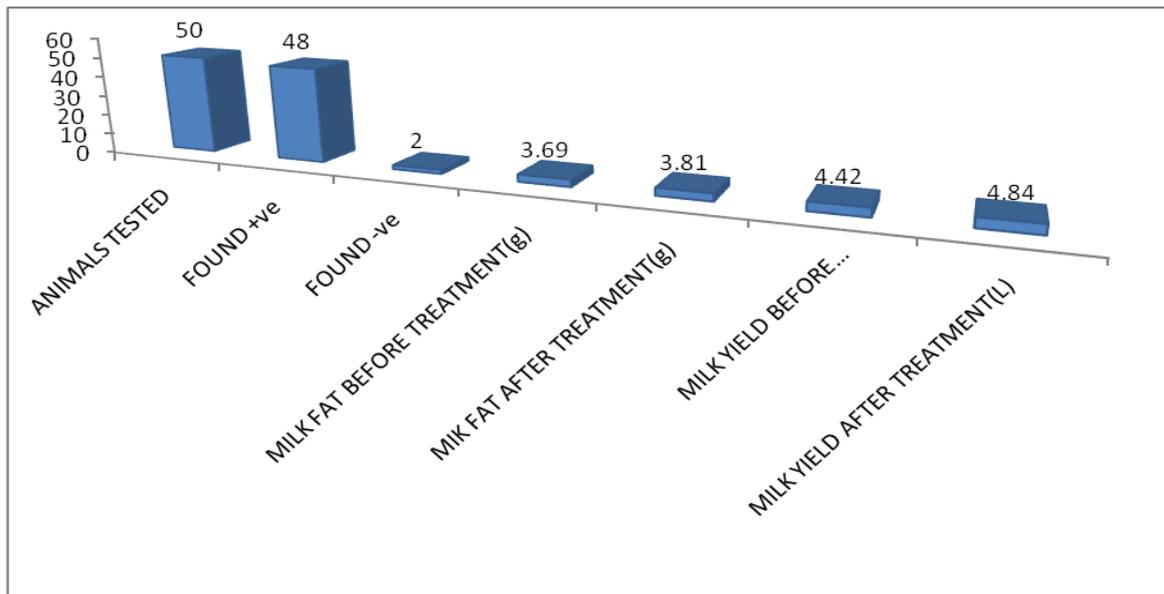


Figure -1

**Conclusion:**

Supplementation of coated Tri sodium citrate, supplemented @ 20 gms for 10 days, reduced pathogenic load, increased milk fat and production significantly in 50 cows, in Devanahally dairy camp

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