

Evaluation of Regular Teat Sanitization Control Measures for Prevention of Sub Clinical Mastitis in Cattle

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ABSTRACT

Objective: The objective of the experiment was to assess efficacy of herbal teat dip, Mastidip liquid (*M/S Ayurved Limited, India*) in reducing incidence of mastitis in healthy animals, sustenance of lactation & in improving milk yield.

Method: 30 apparently healthy mastitis free lactating Holstein freisian cows of same lactation and in early lactation were divided into three groups. Group I served as Control animal group, no treatment group. Group II, was treated with an herbal teat dip post milking in 1:1 dilution twice daily and Group III, was treated with herbal teat dip post milking in 1:2 dilution twice daily immediately after milking.

Result: Statistical analysis of the results showed significantly lower SCC ($\times 10^3$) in Group III (155.2 ± 43.7) and in Group II (188.26 ± 35) in comparison to untreated Group I (348.26 ± 68.28). None of the animals in group II showed signs of SCM and CM during the study. The milk yield was significantly improved in Mastidip liquid treated group.

Conclusion: Herbal teat dip post milking in 1:1 dilution twice daily immediately after milking for a period of one month was found to be more efficacious in preventing the incidence of both SCM and CM in dairy cows.

Keywords: Mastitis, Herbal teat dip, Udder, Somatic cell count, Mastitis.

INTRODUCTION

Udder is a productive organ of cattle. For better production it must be healthy. The teat end or orifice is an important first line of defense¹. During milking, bacteria, either

through dirty or under wet conditions at the teat end colonize on contaminated surfaces of milking units². After milking, the sphincter muscle in the teat canal remains

dilated for 1-2 hours and bacteria present during this time can enter the teat canal. Once inside the teat, bacteria trigger the cellular and humoral defense mechanisms of the udder³. If pathogens are not eliminated, they start multiplying in the mammary gland. These bacteria release toxins and induce the release of neutrophil chemotactic factor⁴. At the time of calving; cows were under much stress and if an udder is exposed to wet, dirty conditions the incidences of mastitis will increase⁵. It was reported that the more than 90% cases of udder infections were in high yielder cross bred dairy cows⁶. Fair incidences of bovine mastitis, an udder infection is observed in India and annual economic losses in dairy industries due to udder infections have been estimated up to Rs. 6053.21crore. Out of this Rs. 4365.32 crore loss has been because of the only subclinical version of udder infections⁷. Subclinical mastitis has no visible signs either in the udder or in the milk, but the milk production decreases and the somatic cell count increases⁸. Early diagnosis of mastitis is very important to facilitate its early effective treatment for reduction of production losses and for enhancing the prospects of recovery. The key measurements in the control of mastitis include; sound husbandry practices and sanitation, post milking teat dipping, treatment of mastitis during the dry period and culling of chronically infected animals⁹. Both pre and post treatment of teat during milking with antiseptics is the most effective management strategy for preventing new intramammary infections in dairy cows. So the objective of the trial was to assess efficacy of the herbal teat (nipple of the mammary gland of cattle) dip, Mastidip (*M/S Ayurved Limited, India*) in reducing incidence of mastitis in healthy animals, sustenance of lactation & in improving milk yield.

MATERIALS AND METHODS

The study was conducted on Holstein freisian cows in an organized dairy farm in Kanyakumari district by Veterinary University Training and Research Centre, Nagercoil at Parakkai.

Experiment design

30 apparently healthy mastitis free lactating Holstein freisian cows of same lactation and in early lactation from an organized dairy farm in Kanyakumari district were selected by screening with Mastitis Detection Strip (MDS) and on the basis of Somatic cell count (SCC). Animals were divided into three groups. Group I, (n=10) served as Control animal group, no treatment group. Group II, (n=10) was treated with an herbal teat dip (Mastidip liquid) post milking in 1:1 dilution twice daily and Group III, (n=10) was treated with herbal teat dip (Mastidip liquid) post milking in 1:2 dilution twice daily immediately after milking. Milk samples were collected from all animals and Somatic Cell Count (SCC)¹⁰ was recorded on day 0, 30th and 45th. Since cell numbers in milk are closely associated with inflammation and udder health, these somatic cell counts (SCC) are accepted as the international standard measurement of milk quality. Milk Yield (kg/Day) recorded on day 0, 30th, 45th & 60th.

Statistical analysis

The data from the study was pooled and subjected to suitable statistical analysis using Factorial Completely Randomized Design as described by Snedecor and Cochran¹¹.

RESULTS AND DISCUSSION

Somatic cell count

The most significant subclinical abnormality of the milk is the increase in somatic cell count. Somatic cells in milk, including neutrophils, macrophages and few epithelial cells¹². The average values of somatic cell count ($\times 10^3$) in different groups of cows before day 0 and on day 30th and 45th post dipping are presented in Table 1.

In untreated group I the SCC ($\times 10^3$ cells/ml of milk) was increased from day 0 (114.9 \pm 68.7) to day 45th (348.26 \pm 68.28). This increase in SCC was because of the absence of any teat sanitation treatment and group I became more susceptible to microbial infection. A significant ($p < 0.05$) decrease in SCC ($\times 10^3$ cells/ml of milk) from day 0 (272.1 \pm 72.1) to day 45th (188.26 \pm 35.5) was observed in Mastidip liquid (1:1) treated group II. Similarly, a significant ($p < 0.05$) decrease in SCC ($\times 10^3$ cells/ml of milk) from day 0 (218.6 \pm 69.8) to day 45th (155.2 \pm 43.7) was observed in Mastidip liquid (1:2) treated group III. The findings are in accordance with Vala *et al.*¹³ and Sharma *et al.*¹⁴. In the untreated control group I, one animal showed signs of SCM on the 30th day, 2 animals showed SCM and 1 animal showed signs of CM on the 45th day of the study. In Group III, 1 animal showed signs of SCM on the 45th day of treatment and none of the animals in group II showed signs of SCM and CM during the study. Overall, 30% incidences of mastitis were observed in the untreated control group I on day 45th. Only 10 % incidence of mastitis was observed in Mastidip liquid (1:2) treated group III and no incidence of mastitis were observed in Mastidip liquid (1:1) treated group II on day 45th. Which means Mastidip efficiently reduced the incidences of mastitis.

Average milk yield

The major economic losses due to subclinical mastitis have been attributed to the loss of milk yield. In the present investigation milk-yield (liters/day) of all the animals under experiment were recorded up to day 60th. The milk yield of the three groups were presented in the table 2.

The average milk yield of untreated group I was recorded to be declined by 15.44% on day 30th, this may be attributed to the development of sub clinical mastitis in this group. The milk yield further deteriorated to 25.26% by day 45th and by 41.05% by day 60th of experimental trial. However, no such deterioration in Avg. milk yield was observed in the Mastidip liquid treated groups II & III. There was a non-significant difference in the avg. milk yield of group II and group III during pre-treatment and post treatment on day 30th, 45th & 60th was observed, but values vary significantly ($P < 0.05$) from untreated group I. After herbal (Mastidip) teat dipping, the milk yield showed an increasing trend at different intervals and there was improvement in milk yield on day 60th by 8.19% and 3% in group II and group III, respectively. The results are in accordance with the findings of waghmare *et al*¹⁵.

The resulted teat sanitizing property of Mastidip liquid may be because of its herbal constituents. The product Mastidip liquid (*supplied by M/S Ayurved Limited, Baddi, H.P., India*) comprises of herbs viz, *Berberis lycium*, *Curcuma longa*¹⁶, *Eucalyptus globulus*¹⁷, *Azadirachta indica*¹⁸ and many others in a fixed proportion and these herbal ingredients possess germicidal, antibacterial and emollient properties to udder tissue.

CONCLUSION

The present trial results revealed that application of herbal teat dip product “Mastidip Liquid” was efficacious in

maintaining the normal udder health in healthy animals. Post milking herbal teat dip “Mastidip Liquid” is probably the most important and effective management strategy to reduce the new intramammary infection rate in dairy cows and effective in restoring SCC of milk in subclinical mastitic animals along with an increase in milk yield.

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Table 1. Somatic cell count (SCC) in different groups of animals on day 0, 30th and 45th

Groups	0 day	30 days	45 days	'F' value (between treatment)
	SCC ($\times 10^3$)	SCC ($\times 10^3$)	SCC ($\times 10^3$)	
I, n=10	114.9 ₊ 68.7	222.8 ₊ 70.2	348.26 ₊ 68.28	2.37 ^{NS}
II, n=10	272.1 ₊ 72.1	198.6 ₊ 50.7	188.26 ₊ 35.5	
III, n=10	218.6 ₊ 69.8	180.7 ₊ 39.7	155.2 ₊ 43.7	

Means with different superscripts differ significantly ($P < 0.05$)

Table 2. Average milk yield (Lit/day) in different groups of animals on day 0, 30th, 45th and 60th

Groups	0 day	30 th day	45 th day	60 th day	F-value (Between Treatments)
I, n=10	14.25 \pm 1.27	12.05 \pm 0.96	10.65 \pm 1.05	8.40 \pm 1.16	15.9*
II, n=10	14.65 \pm 1.85	15.35 \pm 1.35	15.80 \pm 1.55	15.85 \pm 1.45	
III, n=10	13.75 \pm 2.15	13.95 \pm 1.95	14.10 \pm 2.35	14.15 \pm 1.85	

Means with different superscripts differ significantly ($P < 0.05$)