

Supplementation to prevent subclinical mastitis

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Abstract

Effect of supplementation of Zinc, Copper and Levamisole on incidence of subclinical mastitis was studied. The level of zinc increases significantly after supplementation and 75% animals was recovered. However in copper supplemented animals (12) only two animals showed complete recovery. None of the animals in Zinc and Copper supplemented group developed clinical mastitis. In levamisole supplemented group, 50% cows remained in subclinical state while 50% converted in clinical mastitis. So, the zinc supplementation is better over other two supplementation.

Keywords: Subclinical mastitis, California Mastitis Test (CMT), Zinc Sulphate, Copper Sulphate, Levamisole.

Introduction

Dairy cattle are most susceptible to mastitis during first two week after drying off, two week before calving and first two week after calving. Proper feeding of dry cows with attention to proper mineral supplementaion can significantly improve immune function. On the other hand, deficiencies in minerals can result in immunodepression. Rations fed to cows are often deficient in zinc, copper, selenium and vitamin E that are primary minerals and vitamin that affect immune function by increasing the phagocytic activities of mammary polymorph nuclear and mononuclear cells (Daley and Hayes, 1992). Therefore, it becomes utmost desirable to balance a seperate dry cow ration. So, the present study was undertaken to assess the effect of supplementation with zinc, copper and levamisole on subclinical mastitis cases.

Material and Methods

Among the randomly selected second to fifth lactation buffaloes from the different villages of Udham Singh Nagar, Pantnagar, forty eight California Mastitis Test (CMT) positive cases were equally divided into four groups comprising 12 animals in each group. First group was supplemented with Zinc @300 mg per day. Second group was supplemented with copper sulphate @180 mg per day. Third group was injected with levamisole subcutaneous @ 2.5ml at weekly interval. First two

groups supplemented 3 week before and 3 week after the calving. Third group was also injected for the same period. Fourth group kept unsupplemented as control. Serum was harvested from weekly collected 10 ml blood samples and digested for copper as well as zinc estimation by atomic absorption spectrophotometer (GBC-90) and values expressed as micrograms per deciliter (mcg/dl).

Results and Discussion

The level of zinc just before the commencement of supplementation was 87.53 ± 3.47 and 91.47 ± 4.13 mcg/dl in experimental and control group respectively, which appears on the lower side of the normal range coinciding with Rajora (1988) and at termination of study the level significantly increased by 28% which was 122.34 ± 14.49 mcg/dl in zinc supplemented animals coinciding with the findings of Tuteja, et.al. (2004). The mean CMT scores of 2.78 ± 0.18 on 0 day decreased significantly to 1.97 ± 0.47 and 75% animals recovered.

The concentration of copper before supplementation and after supplementation was 91.91 ± 9.89 mcg/dl and 131.28 ± 14.67 mcg/dl respectively, that increased by 30% but only two cows recovered and rest of the cows remained in the subclinical state. This finding is in agreement with Domingues, et.al. (2001). There was decline CMT score point 1.89 ± 0.69 to 1.54 ± 0.46 was recorded and only 42.67% cases were recovered.

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Table- 1 Effect of Supplementation of zinc and copper

Mineral	Group	Before Treatment (mcg/dl)	After Treatment (mcg/dl)
Zinc sulphate	Supplemented	91.47 ± 4.13	122.34 ± 14.49
	Control	87.53 ± 3.47	86.57 ± 5.86
Copper sulphate	Supplemented	91.91 ± 9.89	131.28 ± 14.67
	Control	93.73 ± 5.16	95.64 ± 4.53

In both group, supplementation prevented the conversion in clinical state thereby supporting their role in enhancement of immune system during the immunocompromised state of periparturient animal (Harmon and Torre,1994).

In levamisole injected animals, none showed recovery and six animals were progressed to mastitis with increased mean CMT score point from 2.16±0.52 to 2.35±0.47. Supplementation of Levamisole was found to be least effective in prevention of mastitis but percentage of clinical episode was less than that of control group because levamisole has its effect on macrophages and on humoral as well as cell-mediated immune response (Hamza and Chaudhary, 1994) might have prevented mastitis upto little extent.

Conclusion

Taking care to formulate a dry cow ration with attention to the level of copper and zinc alongwith other nutrients helps in improvement of immune function, which reduces the incidence of mastitis. However, extensive experimentations are desirable to elucidate all acceptable formulation for the purpose.

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Table- 2 Efficacy of Supplementation therapy in subclinically mastitic buffaloes

Gropup	No. of Animals	Recovery Status			CMT Tes	
		Recovered	Not Recovered	Mastitis Developed	Pre Treatment	Post Treatment
I	12	9 (75.00%)	3 (25.00%)	--	2.78 ^a ± 0.17	1.97 ± 0.47
II	12	5 (41.66%)	7 (58.33%)	--	1.89 ± 0.69	1.97 ± 0.46
III	12	--	8 (66.66%)	4 (33.33%)	2.16 ± 0.52	2.35 ± 0.47
IV	12	--	6 (50%)	6 (50%)	1.87 ± 0.59	1.75 ± 0.63

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