

# Effect of area specific mineral mixture supplementation on production performance of dairy animals in West Godavari District of AP

T. VIJAYA NIRMALA\*, A.DEVIVARAPRASAD REDDY, E. KARUNA SREE,

K.VENKATA SUBBAIAH, V.DEEPTHI, J. VENKATA SATISH,

B. SRINIVASULU, J. V. PRASAD

Krishi Vigyan Kendra,

Dr. YSR Horticultural University,

Venkataramannagudem, West Godavari district-534101, Andhra Pradesh,

INDIA

**Abstract :** - A study was conducted in tribal villages of West Godavari district to observe the effect of area specific mineral mixture supplementation on the production performance of dairy animals. Thirty dairy animals were selected randomly from 5 villages of Buttaigudem mandal, West Godavari (A.P.) (Yerrayigudem, Doramamidi, Ravigudem, Reddyganapavaram and Kamaiahkunta) and categorized into two groups of fifteen animals each. The dairy animals in the treatment group were fed with 50 g of area specific mineral mixture daily for 90 days of lactation and control group of 15 animals were not fed any area specific mineral mixture. The analysis of data showed that additional supplementation of area specific mineral mixture has increased the milk yield by 1.08 liter /day (16.64 %) in the treatment group when compared with the control group. The study showed that economic parameters such as gross returns, net returns and B:C ratio were found high in treatment group. Based on this, it is recommended that continuous feeding of area specific mineral mixture has improved the production performance of dairy animals.

**Key-Words:** Area specific mineral mixture; dairy farmers; milk yield;

Received: June 18, 2021. Revised: April 7, 2022. Accepted: May 9, 2022. Published: June 29, 2022.

## 1 Introduction

India is the highest milk producing country in world, because of the sizeable population of its dairy animals. But, per animal milk production in the India is still very low which can be attributed to poor nutritional management leading to several mineral deficiency diseases [1]. Minerals are the essential nutrients bearing a important role in the animal production and reproduction, because their excess or deficiency produces a negative effect on productivity of livestock [2]. However, majority of the feed and fodders given to livestock are deficit in major nutrients all over India [3]. Most of the animals in developing countries including India are fed on agriculture by products and inferior quality crop residues, which have got low nutritive value and digestibility [4]. Problem of mineral deficiency diseases in dairy animals have been reported by many scientists because of low availability of some essential micro and macro minerals in different feed stuffs. Regular supplementation of mineral mixture in the diet of dairy animals have improved milk yield [5]. The present study was conducted to

find out the effect of area specific mineral mixture supplementation on milk yield of dairy animals over a period of 90 days.

## 2 Material and Methods

Krishi Vigyan Kendra, Venkataramannagudem has conducted frontline demonstration on effect of area specific mineral mixture supplementation on productive performance of dairy animals during 2018-19 to 2020-21 in the adopted mandals. After completion of the frontline demonstration, a study was carried out to find the effect of area specific mineral mixture supplementation on productive performance of dairy animals in the implemented villages. Thirty lactating animals of nearly the same lactation stage, milk yield and parity were selected from five villages (Yerrayigudem, Doramamidi, Ravigudem, Reddyganapavaram and Kamaiahkunta). To maintain similarity in all feeding and managemental practices, two milking animals of each farmer were selected and one animal was kept as treatment (T) and another was kept as control (C). Milking animals in

control group were fed on 25-30 Kg of green fodder, 4-5 Kg of paddy straw and concentrate mixture @ 1.5 Kg/day without any addition of area specific mineral mixture, whereas in treatment group in addition to above, animals were given additional feeding of mineral mixture @ 50 grams/animal/day for a period of 3 months. This area specific mineral mixture comprising calcium 18.5%, phosphorous 10.6%, zinc 0.65%, copper 0.28%, manganese 0.36%, and salt 25%. Ad libitum drinking water was offered. The data on different parameters was recorded by their owners daily and weekly by the researcher and these values were tabulated and analyzed.

### 3 Results and Discussion

#### 3.1 Milk parameters

The recorded observations on milk yield and their composition and data were presented in table-1. It was observed that the average daily milk yield was found higher in treatment group ( $7.57 \pm 1.42$  liters) than in the control group ( $6.49 \pm 1.25$  liters). The recorded peak milk production in treatment group ( $8.68 \pm 0.16$  liters) was also found significantly ( $p < 0.05$ ) higher than in control group ( $7.59 \pm 0.30$  liters). Besides this, total milk yield for 90 days was found more in treatment group ( $685.3 \pm 0.87$  liters) than in control group ( $590.8 \pm 1.18$  liters). These findings are similar with results of [6] who reported that average daily milk yield of treatment group cattle was 9.88 liter/day which was more than a control group (9.72 liter/day). The milk yield of milking animal on an average increased remarkably to 1.08 per day. These results are in accordance with findings of [7], [8], [9], [10] who reported higher milk yield because of area specific minerals supplementation. The percentage change in production of milk was 16.64 which is similar with results of [5] who reported additional feeding of area specific mineral mixture increased milk production by 25% in field trials. [11] also reported that TANUVAS- mineral mixture supplementation in dairy animals, resulted in an increase in milk production by one liter. The average percentage of milk fat was found higher in treatment group ( $6.3 \pm 0.30\%$ ) than the control group ( $5.9 \pm 0.27\%$ ). These finding are in line with results of [12] and [13].

#### 3.2 Economic parameters

Economic analysis of the data (table 2 & fig.1) showed that area specific mineral mixture supplementation enhances the milk yield by 16.64 percent in the treatment group. Gross returns from

sale of milk for duration of ninety days (Rs. 30,838 for treatment and Rs. 23,632 for control) and also net profit per animal was also observed higher in treatment group (Rs. 21,028) than control group (Rs. 14,092). The benefit-cost ratio was also recorded higher in treatment group (3.14) as compared to control group (2.47). It was observed that farmers are getting Rs. 48.6 per animal as additional profit per day by supplementing with mineral mixture.

### 4 Conclusion

Results of the present study revealed that additional supplementation of area specific mineral mixture in the diet of milking animals improve the productivity of animal and also high benefit cost ratio. Hence it is advised to educate the farmers about scientific feeding of their milking animals with the area specific mineral mixture for getting optimum productivity and more profits from dairy farming.

#### Acknowledgement

Authors wish to thank the Director, ICAR-ATARI, Zone X for sanction of funds and the Vice-Chancellor, Dr YSR Horticultural University, Venkataramannagudem for providing the facilities are gratefully acknowledged.

#### References:

- [1] Singh, S., Chabra, S., Singh, C., Randhawa, S. S. and Gupta, D. K., Effect of Area Specific Mineral Mixture Feeding On Milk Yield and Composition of Dairy Animals of Central Zone of Punjab, *International Journal of Livestock Research*, 6 (3), 2016, 62-65. doi:10.5455/ijlr.20160326103223.
- [2] Akhtar M.S., Farooq A.A. and Mushtaq M., Serum trace mineral variation during pre and post partum period in Nili Ravi buffaloes. *Journal of Animal and Plant Sciences*, 19 (4), 2009, 182-184.
- [3] Sharma M. C., Joshi C. and Das G., Soil fodder and serum mineral(cattle) and haematobio chemical profile in some districts of Central Uttar Pradesh, *Veterinary Research Communications*, 32 (1), 2008, 49-63.
- [4] Goff J. P. and Horst R. L. Effect of the Addition of Potassium or Sodium, but not Calcium to Prepartum Ration on milk fever in Dairy Cows, *Journal of Dairy Sciences*, 80, 1997, 176-186.
- [5] Tiwari Rupasi., Sharma M.C. and Singh B.P., Awareness and impact of area specific mineral mixture technology in field situation, *Indian Journal of Animal Sciences*, 83(4), 2013, 435-437.

[6] Tanwar P.S., Verma H.K. and Jadoun Y.S., Effect of Mineral Supplementation on Production and Reproduction Performance of Buffaloes under Farmer Management Practices, *International Journal of Agriculture Sciences*, 11 (1), 2019, pp.-7707-7709.

[7] Akila N. and Senthilvel K., Impact of TANUVAS cattle mineral mixture in productive and reproductive performance of dairy animals. *Indian Cow*, 10, 2013, 31-35.

[8] Saxena P.C., Tiwari D.P., Kumar A., Mondal B.C. and Sharma R.J., Dietary copper and phosphorus supplementation to cattle and buffaloes on production performance under field conditions in plain region of Uttarakhand, *Indian Journal of Animal Sciences*, 78(10), 2008, 1138–1143.

[9] Sharma J., Kumar A., Tiwari D. P. and Mondal B. C., Effect of dietary supplementation of calcium, copper and manganese on production performance of dairy cattle. *Indian Journal of Animal Sciences* 79(7), 2009, 686–691.

[10] Tiwari S. K., Kumar A., Tiwar D.P., Mondal B.C. and Saxena P.C., Response to strategic dietary mineral mixture supplementation in cattle and buffaloes under field conditions (Hill region) of Nainital district of Uttarakhand, *Indian Journal of Animal Sciences*, 82 (11), 2012, 1381–1385.

[11] Senthikumar S., Adoption of innovative dairy farming technology in the farmers field. *Asian Journal of Dairy and Food Research*, 37(1), 2018, 26-27.

[12] Madke P.K., Devendra Pal, Satya Prakash and Anant Kumar., Effect of mineral mixture feeding on milk yield in buffalo. *International Journal of agricultural Invention*. 3 (1), 2018, 84-86.

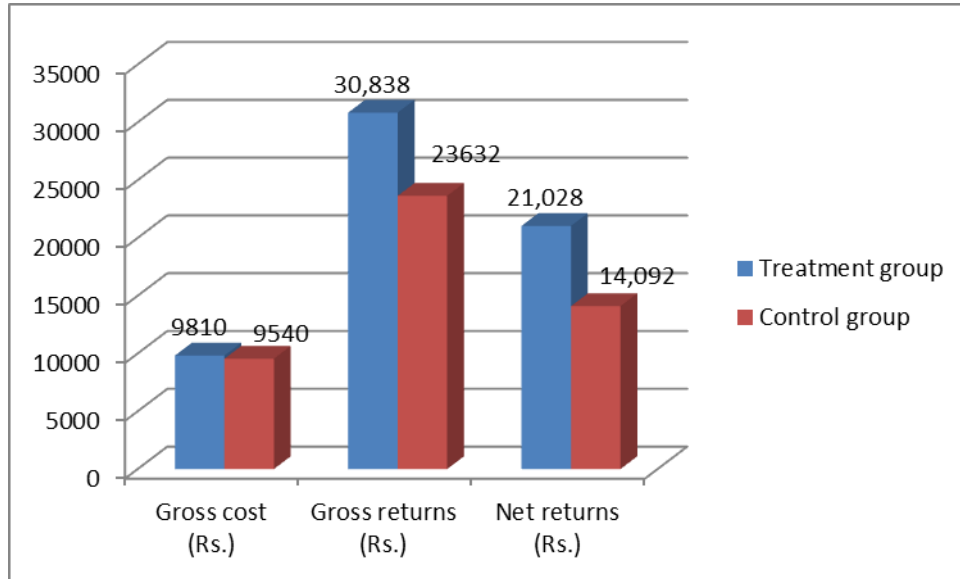
[13] Verma, R. K., Kumar, P., Adil, A. and Arya, G. K., Effect of Feed Supplement on Milk Production, Fat % Total Serum Protein and Minerals in Lactating Buffalo, *Veterinary World*, 2(5), 2009, 193-194.

**Table 1 : Changes in milk yield and milk components**

Milk yield parameter	Treatment group	Control group
Average daily milk yield (lit/day)	7.57 ± 1.42	6.49 ± 1.25
Peak milk yield (lit.)	8.68± 0.16	7.59±0.30
Total milk yield for 90 days (lit)	685.3 ± 0.87	590.8 ± 1.18
Milk fat (%)	6.3 ± 0.30	5.9 ± 0.27

**Table 2 : Economics of supplementing area specific mineral mixture in dairy animals**

Particular	Treatment group	Control group
Gross cost (Rs.)	9810	9540
Gross returns (Rs.)	30,838	23632
Net returns (Rs.)	21,028	14,092
B:C ratio	3.14	2.47
Additional milk yield by supplementing mineral mixture (lit)	1.08	-
Milk yield increases over control (%)	16.64	-
Value of additional milk (Rs./day)	48.6	-
Cost of area specific mineral mixture supplementation (Rs./day)	3.0	-



**Fig.1. Economics analysis of supplementing area specific mineral mixture in dairy animals**