Study on the effect of TANUVAS mineral mixture supplementation on milk yield and milk composition of cross bred dairy cattle in Tiruppur district of Tamil Nadu

P CHITRA

ICAR- Krishi Vigyan Kendra (TNAU), Tiruppur 641667 Tamil Nadu, India
Email for correspondence: drpchithupsc@gmail.com

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ABSTRACT

The experiment was carried out to study the effect of TANUVAS mineral mixture supplementation on the milk yield and milk composition of cross bred dairy cattle in Tiruppur district of Tamil Nadu. One hundred cross bred cattle were selected for the experiment in five different villages of Tiruppur district and divided into two equal groups. Control group animals were fed as per farmers' practice and without addition of mineral mixture whereas animals from treatment group were fed with supplementary feeding of TANUVAS mineral mixture @ 50 g/day/cow for a period of 60 days. Milk samples were collected and milk composition viz fat and solid not fat were analysed for control and treatment group. Cattle supplemented with TANUVAS mineral mixture showed increased milk yield of 1.45 litre per day. The fat and solid not fat increased to 1.21 and 0.67 per cent.

Keywords: Dairy cattle; mineral mixture; milk yield; milk composition

INTRODUCTION

India stands first in milk production in the world largely due to the large population of its dairy animals. However milk productivity per animal is still very low in India. This can be attributed to poor nutritional management leading to several metabolic disorders such as mineral deficiency diseases. Therefore improving the productivity of the animals is important. The major challenge in dairy industry feeding of dairy cows is to find out the right balance of these nutrients which include minerals to enhance the productive and reproductive performance of the animals. Animals mainly receive minerals from regular feed and fodder; unfortunately the demand is not met out by regular feeding.

Mineral imbalances occur in cattle due to poor feeding practices and antagonistic effect of minerals. Inadequate supply of mineral elements adversely affects the inherent capacity of animals for optimum production and reproduction. Large number of livestock in many parts of our country consumes feedstuffs that do not meet the optimum requirements of these mineral elements.

Sharma et al (2002, 2003) reported that dairy animals with macro- and micro-mineral deficiencies had been producing milk sub-optimally and subsequently showed improved milk production levels post-mineral supplementation.

Among livestock, dairy cows are essential asset to the rural people of Tiruppur district in Tamil Nadu who are directly linked in agricultural farming for sustainable nutrition and income generation. The optimum productive and reproductive efficiency of livestock can be achieved only if the animal receives required quantity of feedstuffs, all nutrients in proper proportion and good management and comfortable environment. Dietary deficiencies of micro-minerals result in failure of the mineral homeostasis mechanism affecting the productive and reproductive potential of the animal. This condition is more prominent with high yielding crossbred dairy cows than the local breeds. Most of the dairy farmers do not supplement the mineral mixture.

The present study was conducted to assess the effect of TANUVAS mineral mixture

supplementation on milk yield and milk composition of cross bred dairy animals of Tiruppur district of Tamil Nadu.

MATERIAL and METHODS

The present experiment was carried out to study the effect of TANUVAS mineral mixture supplementation in milk yield and milk composition of cross bred dairy cattle maintained under semi-intensive system of management in Tiruppur district of Tamil Nadu under field conditions.

TANUVAS mineral mixture

TANUVAS mineral mixture was released by the Department of Animal Nutrition, Madras Veterinary College, Tamil Nadu University of Veterinary and Animal Sciences, Chennai, Tamil Nadu. The composition of TANUVAS mineral mixture is presented in Table 1.

One hundred farmers with single cross bred cattle were selected randomly in five villages viz Ammapalayam, Ugayanur, Kattur, Malayampalayam and Valasupalayam in Tiruppur district of Tamil Nadu. All the animals selected were at a comparable stage of lactation ie within first to second month of lactation and were maintained under similar management conditions throughout the experiment (within 2-4 months of lactation stage and calving ranging from 2nd to 5th calving).

Table1. Composition of TANUVAS mineral mixture

Mineral	Quantity (%)	Mineral	Quantity (%)
Calcium	23	Manganese	0.12
Phosphorus	12	Cobalt	0.012
Magnesium	6.5	Zinc	0.38
Iron	0.5	Sulphur	0.5
Iodine	0.026	Fluorine	0.07
Copper	0.077	Selenium	0.3 ppm

The study was conducted during the year of 2020-2021. Before conducting the experiment awareness programmes on popularisation of TANUVAS mineral mixture in dairy cattle were conducted for the selected farmers. The dairy cattle were dewormed with fenbendazole @ 10 mg/kg body weight before conducting the experiment. All the 100 selected cows were divided into two equal groups. Control group animals were fed as per farmers' practice and without addition of mineral mixture whereas animals from treatment group were fed with supplementary feeding of TANUVAS mineral mixture @ 50 g/day/cow for a period of 60 days (Plate 1).

After conducting the awareness programme in identified villages, 3 kg of TANUVAS mineral mixture was distributed to treatment groups of each selected farmer in five villages. The daily milk yield of these animals was recorded for two weeks after supplementation of mineral mixture for a period of 60 days. Milk samples were collected after supplementation twice a week for two months. Collected milk samples were analysed for fat and SNF percentage.

Plate 1. Supplementation of TANUVAS mineral mixture to the dairy cows

RESULTS and DISCUSSION

The results of the experiment conducted on dairy cows are presented in Table 2. Dairy cattle under treatment group showed improvement in terms of milk yield that was 19 per cent in 60 days study period as compared to regular farmers' practice without mineral mixture supplement. The milk fat (1.21%) and solid not fat (0.67%) increased and farmers also received better price for milk.

These findings are similar to those of Senthilkumar et al (2016) who reported increase in milk yield, milk fat and SNF in dairy cows by supplementation of mineral mixture in addition to the regular feeding. Tiwari et al (2012) reported increase in milk production as well as in total lactation length in cattle post-area specific mineral mixture supplementation. Hackpart et al (2010) reported an increase in milk production on supplementation of organic zinc, manganese, copper and cobalt to the dairy animals at mid-lactation stage of milk production. Similar findings were made by Akila and Senthilvel (2013) who reported increase in milk yield, milk fat and SNF in dairy cows by supplementation of mineral mixture in addition to the regular feeding.

Table 2. Performance of TANUVAS mineral mixture in cross bred dairy cattle

Component	Control	Treatment
Milk yield (l/day)	7.80 ± 0.23	9.25 ± 0.19
Change in milk yield (l/day)	-	1.45
Change in milk production (%)	-	19
Milk fat (%)	3.72 ± 0.13	4.93 ± 0.146
Milk SNF (%)	7.48 ± 0.21	8.15 ± 0.28
Gross cost (Rs)	7,800	7,965
Gross return (Rs)	14,200	16,650
Net return (Rs)	6,600	8,685
B-C ratio	1.82	2.09

CONCLUSION

In this study, 50 g/day/cow regular supplementation of TANUVAS mineral mixture for 60 days period increased milk yield by 1.45 l per day. The fat and SNF were increased to 1.21 and 0.67 per cent in cattle. In addition to the increased milk yield and milk quality, the incidence of metabolic disorders and mastitis were also reduced in the dairy animals by regular supplementation of 50 g TANUVAS mineral mixture.

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