

STUDY ON THE EFFECT OF TANUVAS MINERAL MIXTURE ON MILK PRODUCTION IN MILCH CATTLE

N.V. Rajesh¹ and T.A. Vijayalingam^{*2}

Veterinary University Training and Research Centre
Tamil Nadu Veterinary and Animal Sciences University
Ramanathapuram, Tamil Nadu

ABSTRACT

A comparative study to assess the quantity and quality of milk production in milch cattle using TANUVAS and Commercial (AGRIMIN[®] FORTE) mineral mixture was conducted in two dairy farms in Ramanathapuram district in the form of On Farm Trials (OFT). Three animals in the same stage of milking were selected from each farm. The animals were divided in to three groups viz. A, B and C with one animal in each group. All the animals were in the same plane of nutrition in the particular farm. Group A was kept as control, Group B supplemented with TANUVAS mineral mixture and animals in Group C were supplemented with AGRIMIN[®] FORTE and the study was conducted for a period of 4 months. Although both the treatment groups (B and C) showed elevation in volume of production and fat % and the rate of raise in fat % was found to be higher in group B and the amount of raise in volume of milk produced was found to be higher in group C. The SNF % and Protein % were found to be increased only in group C.

Keywords: TANUVAS Mineral Mixture, AGRIMIN[®] FORTE Mineral Mixture, On Farm Trials, Milch cattle

Received : 10.11.2022

Revised : 20.12.2022

Accepted : 27.12.2022

INTRODUCTION

The dairy sector is one of the crucial sectors in the Indian economy that not only provides employment to millions of rural households but also contributes to the economy (Vinothraj *et al.*, 2021). Ramanathapuram

district lies in an agro-climatic region with semi-arid and draught conditions, favouring limited cattle population as compared to small ruminants and poultry. Grazing is the major source of feed for the dairy animals. The dependency of vegetation in grazing areas to annual rainfall in this area has created a declining trend in availability of fodder. Due to vagaries in monsoon and scarcity of fodder production, farmers hesitate to hold

¹Assistant Professor

²Professor and Head, *Corresponding author E-mail: tavijayalingam@gmail.com

dairy animals in their households. Poor milk production, delayed sexual maturity, poor conception rate, delayed calving interval is of major concern in this district.

The productive and reproductive potential of animal is affected due to dietary deficiency of mineral mixture (Srivara Buddhi Bhuvaneswari, 2019). The feeds and fodders fed to livestock in India are deficient in nutrients (Sharma *et al.*, 2008). The problem of mineral deficiency diseases in dairy animals due to low availability of essential micro and macro minerals in different feeds and fodders is another factor affecting the productivity of livestock. Farmers are generally unaware that mineral mixture supplementation can overcome this problem. Some farmers who are willing to provide mineral supplement to their animals hesitate to do so because of the high cost of mineral mixture in the commercial market. In order to motivate the farmers on the usage of mineral mixture in dairy cattle and to popularize the effectiveness of TANUVAS mineral mixture, which are comparatively cost effective than commercially available mineral mixture, a study in the form of On Farm Trials (OFT) was conducted. The objective of the study was to understand the effect of TANUVAS - mineral mixture and to compare it with a commercially available product in augmenting the quantity and quality of milk production in Ramanathapuram district of Tamil Nadu

MATERIALS AND METHODS

The OFT was conducted in two dairy farms in Ramanathapuram district, Tamil

Nadu. A total of six dairy animals, three from each farm, were selected. The selected animals were approximately in the same stage of production and plane of nutrition (Table 1). A total of 3 Groups (2 animals per group) were formed for the trial *viz.*, Group A (A1, A2) - control without any mineral mixture supplementation, Group B (B1, B2) treatment group supplemented with TANUVAS Mineral Mixture @ 50 gm / day and Group C (C1, C2) treatment group supplemented with commercial Mineral Mixture (AGRIMIN® FORTE) @ 50 gm / day. The study was conducted for a period of 4 months (120 days).

During the trial period the variation in quantity of milk (volume in litres) and quality of milk (Fat %, SNF % and Protein %) were assessed in both the control and treatment groups on day 0, day 60 and day 120. The details of animal selected for the trial are given in Table 1. The variation in milk production (volume in litres) and quality of milk (Fat %, SNF % and Protein %) are given in Tables 2 and 3.

RESULTS AND DISCUSSION

The trials showed a raise in milk production of about 0.20 litres during day 120, as compared to day 0 and the fat, SNF and protein per cent were also found to be augmented during day 120 (0.13 per cent, 0.14 per cent and 0.11 per cent respectively) as compared to day 0 in the control group but the level of increase in milk production and milk constituents was smaller as compared to the treatment groups (B and C). In group B a raise in volume of milk production, 0.30

Table 1: Details about the animals selected for the trials

Animal Details	Control		Treatments					
	Group A		Group B (TANUVAS MM)			Group C (AGRIMIN® FORTE)		
	A1	A2	B1	B2		C1	C2	
Breed	Jersey X Fawn	Jersey X Fawn	Jersey X Fawn	Jersey X		HF X	HF X	
Colour				Dark Brown		Black & White	Black & White	
Identification mark	Conjoined stripe mark	Broken horn	732150	Stumped horn		Wound mark in muzzle	White mark Forehead	
Tag No (if any)	Absent	Absent	732150	Absent		Absent	Absent	
Age	3 years	3.5 years	4.5 years	4.5 years		3 years	3 years	
Feeds & Feeding	Green fodder, Pellet feed and mashed grains	Green fodder, Pellet feed and mashed grains	Green fodder, Pellet feed and mashed grains	Green fodder, Pellet feed and mashed grains		Green fodder, Pellet feed and mashed grains	Green fodder, Pellet feed and mashed grains	
Calving History (Past and Present)	Normal	Normal	Normal	Normal		Normal	Normal	
No. of calving	2	2	4	4		2	2	
Length of lactation (in months)	3 months	3 months	3 months	3 months		2 months	4 months	
Milk yield (in litres/day)	10	10	10	16		18	15	
Milk yield in previous calving (in litres/day)	10	10	10	18		17	15	
Pregnant/ Non-pregnant	Non-pregnant	Non-pregnant	Non-pregnant	Non-pregnant		Non-pregnant	Non-pregnant	
History of Mastitis during this lactation	NIL	NIL	NIL;	NIL		NIL	NIL	
Vaccination history	Not vaccinated	Vaccinated for FMD	Not Vaccinated	Vaccinated for FMD		Not vaccinated	Vaccinated for FMD	
Deworming history	Dewormed 2.5 months back	Dewormed 2.5 months back	Dewormed 2.5 months back	Dewormed 2.5 months back		Dewormed 2 months back	Dewormed 3 months back	

Table 2: Impact of mineral mixtures on the quantity and quality of milk in milch cattle

Day	Group		Parameters			
			Volume (litres)	Fat (per cent)	SNF (per cent)	Protein (per cent)
Day 0	Group A	A1	10.00	4.14	7.88	3.18
		A2	10.00	3.80	7.93	3.45
	Group B	B1	10.00	3.83	8.66	3.62
		B2	16.00	3.80	8.20	3.48
	Group C	C1	18.00	3.85	7.90	3.20
		C2	15.00	3.57	7.95	3.13
Day 60	Group A	A1	10.12	4.18	7.94	3.35
		A2	10.2	3.86	7.97	3.38
	Group B	B1	10.25	4.80	8.56	3.34
		B2	16.34	4.84	7.70	3.29
	Group C	C1	18.53	4.20	8.18	3.50
		C2	15.44	4.32	8.22	3.20
Day 120	Group A	A1	10.14	4.28	8.03	3.39
		A2	10.25	3.92	8.06	3.45
	Group B	B1	10.65	4.98	8.52	3.30
		B2	16.58	4.96	7.65	3.21
	Group C	C1	18.85	4.58	8.45	3.66
		C2	15.91	4.53	8.40	3.34

A1, B1 and C1: Animals selected from one Farm

A2, B2 and C3: Animals selected from another Farm

Group A: Control group without any treatment

Group B: Treatment group supplemented with TANUVAS Mineral Mixture @ 50 gm/day

Group C: Treatment group supplemented with AGRIMIN® FORTE @ 50 gm/day.

Table 3: Comparison of milk yield and quality in different treatments

Components	Group 1			Group 2			Group 3		
	0 th Day	60 th Day	120 th Day	0 th Day	60 th Day	120 th Day	0 th Day	60 th Day	120 th Day
Volume (L)	10.00	10.16	10.20	13.00	13.30	13.62	16.50	16.99	17.38
Fat (per cent)	3.97	4.02	4.10	3.82	4.82	4.97	3.71	4.26	4.56
SNF (per cent)	7.91	7.96	8.05	8.43	8.13	8.085	7.93	8.20	8.43
Protein (per cent)	3.31	3.37	3.42	3.55	3.32	3.26	3.17	3.35	3.50

litres at 60th day and 0.62 litres at 120th day of the trial was recorded. There was a raise of 1.0 per cent in day 60 and 1.15 per cent during day 120 in Fat as compared to day 0. However, there was a reduction in the value of SNF (%) and protein (%) during 60th and 120th day as compared to 0th day of milk production. Whereas in treatment group C there was a raise in the volume of milk production, fat, SNF and protein per cent as shown in the Tables 2 and 3 on day 60 and 120 of the trial.

Vinothraj *et al.* (2021) reported that TANUVAS mineral mixture as supplementation increased milk production by 1.06 litres, fat by 1.73 per cent and SNF by 0.77 per cent in 30 days. Chitra (2021) reported similar results that cattle supplemented with TANUVAS mineral mixture showed increased milk yield to 1.45 litres, fat and SNF increased to 1.21 and 0.67 per cent, respectively. Vijaya Nirmala *et al.* (2022) analysed the milk production parameter alone and stated that the milk yield increased by 1.08 litres when compared to the control group in a period of 90 days. Kumar (2018) also indicated that the supplementation of TANUVAS-mineral mixture in dairy cattle

resulted in increase in milk yield by 0.72 litre, fat percentage increased by 1.58 per cent and SNF increased by 0.93 per cent. In this OFT trial, the study revealed that TANUVAS mineral mixture supplementation increased the milk production and fat per cent but there was a reduction in SNF and protein per cent which differed from the previous studies. Probably the age might have played a significant role on the milk protein percentage and composition in cows as per the earlier reports (Ng-Kwai-Hang *et al.* 1982; Rogers and Stewart, 1982; Jenness, 1985). A reduction of about 0.4 percentage of milk protein was reported in cows older than 3 years (Rogers and Stewart, 1982). In this study the rate of fall in SNF and protein per cent might be due to the older age group of animals in Group B.

The elevation of fat per cent was higher in group B and the amount of production was found to be higher in group C. Although, the commercial mineral mixture AGRIMIN® FORTE was found to increase all the parameters, the rate of raise in fat per cent was higher in the group supplemented with TANUVAS mineral mixture. It was also

noteworthy that TANUVAS mineral mixture is cost effective when compared to AGRIMIN® FORTE and could be used as a valuable alternative for other mineral supplements in dairy farms.

ACKNOWLEDGEMENT

Authors would like to express their gratitude to the Vice-Chancellor, Registrar and the Director of Extension Education, Tamil Nadu Veterinary and Animal Sciences University for providing this wonderful opportunity to work on this On Farm Trials (OFT) and bring as a research data source for the benefits and welfare of scientific community and farmers.

REFERENCES

- Chitra, P. (2021). Effect of supplementation TANUVAS mineral mixture on productive performance of cross bred dairy cows. *Agriways*, **9**(2): 90-92,
- Jenness, R. (1985). Biochemical and nutritional aspects of milk and colostrum. Ch. 5 in Lactation, B. L. Larson, editor., ed. Ames: Iowa State University Press.
- Kumar, P.S. (2018). Profitable effect of supplementation of TANUVAS mineral mixture in dairy cows. *Indian Veterinary Journal*, **95**(1): 13-15.
- Ng-Kwai-Hang, K. F., Hayes, J.F., Moxley, J.E. and Monardes. H.G. (1982). Environmental influences on protein content and composition of bovine milk. *Journal of Dairy Sciences*, **65**: 1993-1998.
- Rogers, G. L. and Stewart, J.A. (1982). The effects of some nutritional and non-nutritional factors on milk protein concentration and yield. *Australian Journal of Dairy Technology*, **37**(1): 26-32.
- Sharma, M.C., Joshi, C. and Das, G. (2008). Soil fodder and serum mineral (cattle) and haematobio chemical profile in some districts of Central Uttar Pradesh. *Veterinary Research Communications*, **32**(1): 49-63.
- Srivara Buddhi Bhuvaneswari, S. (2019). Assessment of area specific mineral mixture supplementation productive and reproductive performance of milch cows: an on farm trial. *International Journal of Research and Analytical Reviews*, **6**(2): 546-549.
- Vijaya Nirmala, T., Devivaraprasad Reddy, A., Karuna Sree, E., Venkata Subbaiah, K., Deepthi, V., Venkata Satish, J., Srinivasulu, B. and Prasad, J.V. (2022). Effect of area specific mineral mixture supplementation on production performance of dairy animals in West Godavari District of AP. *International Journal of Veterinary Medicine*, **4**: 1-4.
- Vinothraj, S., Alagesan, P., Srinivasan, R.D., Saravankumar and Siva, M. (2021). TANUVAS mineral mixture for enhancing milk yield of dairy cows. *The Pharma Innovation Journal*, **10**(2): 21-23.