

Original Research Article

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Effect of mineral mixture on growth performance of post weaning growing kids



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ABSTRACT

An on-farm experiment was conducted to assess the effect of the mineral mixture on the growth performance of goats. 60 growing kids of Non-descript local breeds were randomly distributed in three groups (FP, T1, T2). The growing kids were fed as per the farmer's practices along with supplementation of NIANP mineral mixture and TANUVAS sheep and goat mineral mixture @ 10g/goat/day through water for 90 days. The results of the present study revealed that supplementation of mineral mixtures non significantly improve final body weight, total body weight gain and average daily gain compared to farmers practice. The BCR of the TANUVAS sheep and goat mineral mixture was higher than the NIANP goat mineral mixture and farmers practice. The results of the present study showed that the growing kids reared under grazing with groundnut haulms supplemented with TANUVAS sheep and goat mineral mixture showed higher economic return compared to NIANP goat mineral mixture and farmers practice.

Keywords: Goat, growing kids, mineral mixtures, growth

INTRODUCTION

As per the 20th Livestock Census in 2019, the goat population in India was 148.88 million, showing an increase of 10.1% compared to the previous census. In India, goat rearing plays an important role in the social upliftment of small and marginal farmers and landless agricultural labors (1). Goat are nicknamed ATM of poor men because of goat sold very easily at the local market or even at farmers houses. In India, the flock size of goats ranges from 1-4 (56 %) and these animals are housed in residential housing (67.1%) (2). Goats are considered more climate resilient than other ruminant species and well-suited for small farming (3).

The browsing habit and anatomical structure of goats can thrive well with limited feedstuffs (4). During feed scarcity, goats can reduce their metabolic processes to conserve energy resources (5). Most of the farmers used to graze their goats for feeding and not supplement the mineral mixture. Therefore, the grazing animals are solely dependent on feed, fodder and pasture land to meet their mineral requirements. The roughages, greens, and concentrates are deficient in minerals, particularly trace minerals. The health and production of livestock is greatly influenced by the optimal level of mineral elements in the body. If there is an imbalance between these minerals either due to deficiency or interaction among themselves, the animal suffers from poor health, immunity, and its production and reproduction (6). Continued ingestion of feedstuffs that are deficient or excessively high in minerals induces biochemical lesions, physiological dysfunctions and nutritional disorders.

To avoid mineral deficiency in the goat, a study on the effect of the mineral mixture on the growth performance of goat was carried out in the Naraikinaru village of Namakkal district. Most of the farmers do not supplement the ration of livestock with mineral mixture. Therefore, the animals are solely dependent on feeds and fodder to meet their mineral requirements. However feeds alone cannot meet the entire requirement, as they are deficient in number of macro and micro Most of the farmers do not supplement the ration of livestock with mineral mixture. Therefore, the animals are solely dependent on feeds and fodder to meet their mineral requirements. However feeds alone cannot meet the entire requirement, as they are deficient in number of macro and micro

MATERIALS AND METHODS

The on-farm trial was carried out in the village Naraikinaru of Namakkal district in Tamil Nadu during the month of October to December in 2021. In this study, 60 Non descript local male goat of 5-6 months of age and average live body weight of 10-11 kg were randomly distributed in three groups viz. Farmers Practice (FP), T1 and T2. The details of the experimental design were presented in Table 1. Feeding trial was continued for 90 days and body weight of post weaning growing kids were recorded before start of experiment (0 day) and after treatment (15, 30, 45, 60, 75, 90, days). All the goats were provided with clean drinking water till the end of the experiment. All goats are allowed to graze for 6-8 hrs in a day. The goats were dewormed with albendazole @ 7.5 mg/kg before start of the experiment. The data was analyzed by ANOVA technique (7).

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DOI: <https://doi.org/10.21276/AATCCReview.2025.13.01.496>

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Table 1. Experimental design of the trial of effect of the mineral mixture on post-weaning growing kids

Groups	No of animals / group	Technology option
FP	20	Grazing 6-8 hrs in a day with feeding of groundnut haulms.
T1	20	Farmers practice with supplementation of NIANP goat mineral mixture @ 10 g/day/goat through water.
T2	20	Farmers practice with supplementation of TANUVAS sheep and goat mineral mixture @ 10 g/day/goat through water

RESULTS

The effect of supplementation mineral mixture on the growth performance of growing kids was presented in Table 1. The body weight of growing kids before start of the experiment was 10.75, 10.86, 10.94 kg in FP, T1, T2 respectively which increased to 16.93, 17.73, 17.89 respectively after 90 days of the experiment.

Table 2. Effect of supplementation of mineral mixtures on Growth performance of growing kids

Parameter	FP	T1	T2	SEM	P Value
Initial weight, kg	10.75	10.86	10.94	0.05	0.35
Final weight, kg	16.93	17.73	17.89	0.21	0.13
Total body Weight gain, kg	6.18	6.87	6.95	0.20	0.25
Average daily gain, g/d	68.67	76.32	77.21	2.45	0.32

^{abc}Means bearing different superscript within the same row differ significantly (P<0.01)

The fortnight body weight of the growing kids was depicted in Table 2. The results of the present study revealed that supplementation of mineral mixtures did not significantly increase final body weight, total body weight gain, fortnight body weight and average daily gain compared to farmers' practice. Among the treatment groups TANUVAS sheep and goat mineral mixture supplemented group was recorded slightly higher final body weight and average daily gain compared to the NIANP goat mineral mixture fed group.

Table 3. Effect of supplementation of mineral mixtures on fortnight body weight and average daily gain of growing kids

Treatments	15 th day	30 th day	45 th day	60 th day	75 th day	90 th day
Body weight (kg)						
FP	11.65	12.72	13.81	14.94	15.91	16.93
T1	11.80	12.84	13.91	15.21	16.43	17.73
T2	11.83	12.90	13.94	15.31	16.47	17.89
SEM	0.03	0.03	0.03	0.09	0.11	0.21
P value	0.08	0.11	0.35	0.25	0.45	0.13
Average Daily Gain (g/day)						
FP	60.41	71.14	72.89	75.59	64.76	72.83
T1	62.62	69.09	71.78	86.21	81.42	86.59
T2	59.71	71.37	68.89	91.82	77.23	94.42
SEM	1.51	2.24	2.06	5.34	5.46	9.03
P value	0.77	0.92	0.77	0.51	0.45	0.59

^{abc}Means bearing different superscript within the same column differ significantly (P<0.01)

The economics of goat farming with the supplementation of a mineral mixture is presented in table 3. Supplementation of the mineral mixture increased net return compared to farmers' practice. The BCR of the TANUVAS sheep and goat mineral mixture was higher than the NIANP mineral mixtures and farmers' practice. In contrast, The BCR of NIANP goat mineral mixture was slightly higher than farmers' practice due to high cost of NIANP mineral mixture compared to TANUVAS sheep and goat mineral mixtures.

Table 4. Effect of mineral mixture on Net Return and B: C ratio of growing kids

Treatment	Cost of production (Rs.)	Net Return (Rs.)	B:C ratio
FP	3386	3893.9	2.15
T1	3686	4292.5	2.16
T2	3638	4412.5	2.21

DISCUSSION

The tropical forages contain an inadequate quantity of required minerals for livestock. The grazing ruminants depend on forage to satisfy mineral requirements and are highly susceptible to mineral deficiency. The mineral composition of forages depends on soil, plant species, stage of maturity, yield, pasture management and climate (8). The minerals play an important in different functions in the body. Calcium and phosphorus are important for the development and maintenance of the body. A deficiency of either or both in growing animals decreased the growth rate. Phosphorus is also important for maintaining adequate feed intake.

Similar to the results of the current study (9) who reported that supplementation of mineral mixture non significantly increase the final body weight, total body weight gain and average daily gain. This study revealed that mineral supplementation through water influences the body weight of goat. Some of the studies reported that supplementation of mineral mixture with concentrate feed significantly increased the body weight compared to control (10-14). In addition, the grazing goat was supplemented with concentrate feed and mineral mixture increased economic return (14). In this study supplementation of mineral mixtures through water with groundnut, haulms increased economic returns in grazing goats compared to farmers' practices.

CONCLUSION

It was concluded that growing kids supplemented with mineral mixture through water influenced growth performance compared to farmers' practice. However, goat supplemented with TANUVAS sheep and goat mineral mixture showed higher economic return compared to NIANP goat mineral mixture and farmers' practice.

CONFLICT OF INTEREST

Authors declared no conflict of interest

ACKNOWLEDGEMENTS

Authors are grateful to ICAR-ATARI, Zone 10, Hyderabad and DEE, TANUVAS, Chennai, Tamil Nadu for providing fund and facilities for the completion of on farm trial programme.

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