International Journal of Veterinary Sciences and Animal Husbandry

ISSN: 2456-2912
VET 2024; SP-9(3): 23-26

www.veterinarypaper.com
Received: 06-03-2024
Accepted: 10-04-2024

Maram Harani
Scientist, ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Korra Balaji Naik
ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Elluru Sireesha
ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Vannam Yugandhar
ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Malavathu Mallikarjun
ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Chandra Radhakumari
ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Corresponding Author:
Maram Harani
Scientist, ICAR-Krishi Vigyan Kendra, ANGRAU, Andhra Pradesh, India

Effect of UMMB supplementation on the growth performance of Nellore brown lambs

Maram Harani, Korra Balaji Naik, Elluru Sireesha, Vannam Yugandhar, Malavathu Mallikarjun and Chandra Radhakumari

Abstract
A study was undertaken at IFS shed, KVK, Kalyandurg (AP, India) to determine the effect of urea molasses mineral block supplementation on growth performance in Nellore brown lambs reared on grazing. Twenty four weaned ram-lambs (average body weight 10.85 kg) were randomly assigned to three groups on the basis of body weight, vizT_1 - Grazing alone (Control), T_2 - grazing with concentrate supplementation @ 100g/kg body weight, T_3 - grazing with UMMB supplementation (1 kg block) for a trial of 120 days. Weighing of animals was done fortnightly before feeding. The final body weights and average daily weight gain were significantly higher in both the treatment groups than in the control group. Higher ADG was noticed in concentrate supplemented group (p<0.01) than UMMB supplemented group. There were noticeable differences between the ADG of groups from the period of 15-30 days of the trial, even though their body weights did not differ significantly up to 45 days. Significant differences were observed in the ADG of different groups at all stages of the experiment. Even though there was no significant difference in early stages of growth, later there was a significant (p<0.05) difference among the supplemented groups.

Keywords: Concentrate, growth, Nellore brown, ram lambs, urea molasses mineral block

Introduction
Reduced grazing areas, low animal production, and erratic rainfall patterns are the main elements influencing sheep farming's profitability. Supplementing with concentrate feed and other feed supplements might help address the ongoing scarcity of feed and fodder as well as their low nutritional content. It has been attempted to substitute the pricey supply of protein in ruminant diets with NPN compounds such as urea. The process of creating urea, molasses, and minerals into a form suitable for animal feeding results in urea molasses mineral block (UMMB), which has been effectively used to cattle (Singh *et al.*, 2010) [10]. UMMB has also been tested on small ruminants in certain countries (Forsberg *et al.*, 2002) [4]. There are few investigations on UMMB supplementation for small ruminants in India. Therefore, the goal of the current study was to determine how concentrate and UMMB supplementation affect the growth traits of Nellore brown lambs intended for mutton production.

Materials and Methods
A growth trial of 120 days was conducted with 24 weaned Nellore brown ram-lambs of 3-4 months age reared on grazing at KVK, Kalyandurg. Animals were in the age group of 3 to 4 months, weaned, and average body weight was 10.85 kg. They were randomly divided into 3 groups of 8 animals each according to their body weight, *viz.*, T_1 - Grazing alone (Control), T_2 - grazing with concentrate supplementation @ 100g/Kg of body weight, T_3 - grazing with UMMB supplementation (1 kg block). Weighing of animals was done fortnightly before feeding and watering in the morning. The concentrate allowance was increased based on the body weight and age of the animals. UMMB of 1 kg size was purchased from Sree Venkateswara Veterinary University (SVVU), Tirupati. and was offered to the ram-lambs. The composition of UMMB was: molasses 45%, urea 15%, Mineral mixture 15%, Cotton seed meal 10%, salt 8%, calcite powder 4%, and sodium bentonite 3%. The data recorded were analysed statistically as per Snedecor and Cochran (1994) [11].

Results and Discussion

Body weight: The fortnightly means (±SEs) of body weight of Nellore brown ram-lambs under trials are presented in Table 1. Up to 45 days into the trial, the body weight of the Nellore brown lambs kept under various treatments did not change significantly. However, there was a significant difference ($p<0.01$) between the 60 and 120-day stages of the trial. Supplementation caused the body weight of Nellore brown ram-lambs to rise. At the conclusion of the trial, animals in the group supplemented with concentrate feed (T_2) had a significantly higher body weight than those in the unsupplemented group (T_1). When UMMB supplementation was used, the T_3 group's body weight increased $p<0.05$ in comparison to the unsupplemented (T_1) group. These results were consistent with those of Forsberg *et al.* (2002) [4] and Singh *et al.* (2010) [10]. Many people have recommended urea molasses products (UMMB) as a nutritional supplement for sheep and goats (Golluscio *et al.*, 1998 [5]; Currier *et al.*, 2004) [2]. It is possible that UMMB might be used to successfully substitute concentrate feed for sheep, given there was no discernible difference in body weights between the groups supplemented with concentrate (T_2) and UMMB (T_3) during the majority of the trials.

In general, the supplemented grazing groups (T_2 and T_3) had larger body weights than the control group (T_1). Numerous studies (Karim and Verma, 2001) [7] concluded similarly, although some studies showed the opposite outcome. This mostly relies on the area and quality of grazing available the time of year and amount of rainfall, the animals' tolerance for stall feeding, and the kind of food provided. According to Karim *et al.* (2004) [6], individuals who reported greater body weights in our nation under intensive system had adopted a composite, balanced, or full diet consisting of concentrate and roughages. Even without any supplements, the lambs' development was modest since they were raised during the monsoon. It has been shown that when there was little or poor nutrition, UMMB utilisation was higher.

Table 1: Fortnightly mean (±SE) body weight (kg) of Nellore brown ram-lambs under different feeding regimens

Days of feeding	T_1 (Control)	T_2 (Concentrate)	T_3 (UMMB)
Initial weight NS	10.95±0.59	10.85±0.61	10.76±0.65
15 days NS	11.28±0.67	11.17±0.72	11.05±0.96
30 days NS	11.97±0.64	12.7±0.82	12.08±0.98
45 days NS	13.43±0.66	14.42±0.85	13.28±1.01
60 days **	14.38^{ab}±0.73	16.15^{bc}±0.82	14.82^{ab}±1.03
75 days **	15.45^{ab}±0.74	18.68^{bc}±0.8	17.46^{ab}±1.16
90 days **	16.23^{ab}±0.69	19.1^{bc}±0.75	17.71^{ab}±1.18
105 days **	17.05^{ab}±0.77	20.45^{bc}±0.81	19.05^{b}±1.23
120 days**	17.70^{ab}±0.83	21.77^{bc}±0.75	20.28^{b}±1.16

Means bearing the same superscript within a row do not differ significantly. *Significant ($p<0.05$), ** highly significant ($p<0.01$), NS non-significant.

Fortnightly Average Body Weight Gain (kg) and Average Daily Body Weight Gain:

Mean (±SE) values of fortnightly average body weight gain (kg) of Nellore brown ram-lambs are presented in Table 2. There were remarkable differences between the body weight gain (kg) of groups, *i.e.*, 17.7±0.83 (T_1), 21.77±0.75 (T_2) and 20.28±1.16 (T_3). Means (±SE) of average daily body weight gain (g) of Nellore brown ram-lambs are presented in Table 3. Even while the groups' body weights did not substantially differ until 45 days there were notable disparities in their average daily growth (ADG) throughout the first 15 to 30 days of the study. Throughout the whole experiment, notable variations in each group's ADG were noted. When sheep were supplemented with concentrate feed or any other appropriate feed supplement, several workers have noted an increase in the ADG of the sheep. Additionally, Petit and Castonguay (1994) [9] found that supplemented groups required less time to fatten.

Table 2: Mean (±SE) fortnightly body weight gain (kg) of Nellore brown ram lambs under different feeding regimens

Days of feeding	T_1 (Control)	T_2 (Concentrate)	T_3 (UMMB)
0–15 days NS	0.33±0.12	0.32±0.14	0.28±0.11
15–30 days *	0.69^{ab}±0.23	1.53^{c}±0.28	1.03^{bc}±0.31
30–45 days **	1.46^{b}±0.32	1.72^{b}±0.47	1.20^{ab}±0.38
45–60 days **	0.95^{b}±0.26	1.73^{c}±0.14	1.54^{bc}±0.31
60–75 days **	1.07^{ab}±0.28	2.53^{c}±0.49	2.64^{bc}±0.58
75–90 days **	0.78^{a}±0.13	0.42^{b}±0.08	0.25^{b}±0.01
90–105 days *	0.82^{a}±0.21	1.35^{b}±0.37	1.34^{b}±0.41
105–120 days **	0.65^{a}±0.19	1.32^{b}±0.38	1.23^{b}±0.41
Total weight gain			

Means bearing the same superscript within a row do not differ significantly. *Significant ($p<0.05$), ** highly significant ($p<0.01$), NS non-significant.

Table 3: Mean (±SE) of average daily body weight gain (g) of Nellore brown ram lambs under different feeding regimens

Days	T_1	T_2	T_3
0–15 days NS	22.00±3.06	21.33±6.08	19.33±6.57
15–30 days *	46.01^{ab}±15.27	102.0^{c}±38.14	68.66^{bc}±15.34
30–45 days **	97.33^{b}±23.06	114.66^{b}±35.81	80.00^{ab}±25.19
45–60 days **	63.33^{b}±15.38	115.33^{c}±28.04	102.66^{bc}±26.82
60–75 days **	71.33^{ab}±13.46	168.66^{c}±45.82	176.00^{bc}±38.46
75–90 days **	52.00^{a}±9.38	27.99^{b}±5.39	16.66^{b}±3.86
90–105 days *	54.66^{a}±8.34	90.00^{b}±24.86	89.33^{b}±13.72
105–120 days **	43.33^{a}±18.47	88.0^{b}±18.57	81.99^{b}±24.81

Means bearing the same superscript within a row do not differ significantly. *Significant (p<0.05), ** highly significant (p<0.01), NS non-significant.

The ADG varied between seasons based on the availability of grazing and the state of the pasture. In the case of grazing groups, it rose later after being lower in the early months. Following that, there was a decline in monsoon precipitation for 75-120 days. The ADG reached its peak in the last several months. Ajoy *et al.* (2007) [1] observed that these variations in ADG were caused by the shifting pasture conditions.

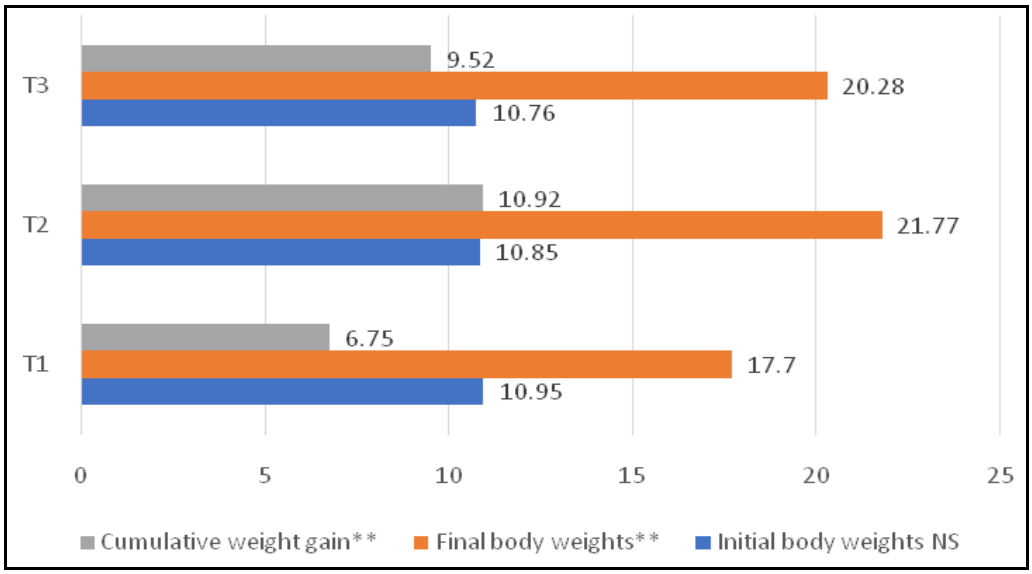
In general, towards the end of the trial, the supplemented groups (T_2, and T_3) outperformed the unsupplemented (T_1) group on average. The concentrate supplemented groups showed a greater increase in ADG than the UMMB supplemented groups. This is consistent with the research projects carried out by Morales *et al.* (2000) [8] and Debasis and Singh (2003) [3]. The groups' overall ADG results showed that supplementation greatly (p<0.01) raised the ADG of ram-lambs. The ADGs for the T_2 group (91.01 g) and T_3 group (79.33 g) were substantially greater over the control T_1 (56.25 g) group, though they did not differ significantly from one another.

In this study, UMMB supplementation raised the grazing animals' ADG. This suggests that because UMMB is simple to feed, farmers may consider using it as a supplement (Morales *et al.*, 2000) [8]. Similar to a salt lick, UMM blocks are easily installed in animal sheds where animals may lick them or nibble on little pieces over time. This is especially beneficial in the evening and early morning when the animals are idle, as it doesn't need additional effort as concentrate feeding does. Additionally, it gives the animals a steady and gradual supply of supplements. Additionally, the animals' digestive system is tuned for optimal NPN utilization by slow intake or consumption.

Table 4: Effect of concentrate and UMMB supplementation on final mean body weight (kg), mean weight gain (kg) and average daily gain (g) of Nellore brown ram-lambs

Treatments	Initial body weights NS	Final body weights**	Cumulative weight gain**	Average daily gain**
T_1	10.95±0.59	17.7^{ab}±0.83	6.75^{a}±0.12	56.25^{a}±0.97
T_2	10.85±0.61	21.77^{bc}±0.75	10.92^{b}±0.09	91.01^{b}±0.73
T_3	10.76±0.65	20.28^{b}±1.16	9.52^{b}±0.07	79.33^{ab}±0.58

Means bearing the same superscript within a row do not differ significantly. *Significant (p<0.05), ** highly significant (p<0.01), NS non-significant.



According to the findings, the T_1, T_2, and T_3 groups' initial weights were 10.95, 10.85, and 10.76 kg, respectively, and their final body weights were 17.7, 27.7 and 20.28 kg. The addition of concentrate and urea molasses mineral blocks to the meal increased performance over the non-supplemented control group and had a substantial (p<0.05) favourable effect on body weight gain as well as nutrient intake. The ADG of Nellore brown lambs in the T_2 (91.01 g) and T_3 (79.33 g) groups was significantly higher (p<0.05) than that of the control group, T_1 (56.25 g). The group that received concentrate supplements had the greatest ADG. In the supplemented groups T_2 and T_3, the ADG (g/day) likewise demonstrated an increasing linear impact, with the T_2 group exhibiting the greatest (p<0.05) ADG (Table 3).

Blood biochemical parameters

Hematology	T_1	T_2	T_3
PCV (%)	25.9	26.05	27.15
Hb (g/dL)	9..13	9..38	10.28
RBC (10^6/ µL)	8.37	8.33	8.64
WBC (10^3/ µL)	10.31	10.48	10.62
Haematocrit (L/L)	0.36	0.35	0.35
MCV (fL)	30.24	30.58	30.96
MCH (pg)	10.29	10.57	10.85
MCHC (g/dL)	37.52	35.84	35.98
Lymphocytes (×109/L)	4.53	3.27	3.14
Monocyte (×109/L)	2.42	2.48	2.52
Eosinophil (×109/L)	0.05	0.06	0.07
Basophil (×109/L)	0.02	0.01	0.01
Platelet count (×109/L)	512.6	632.4	578.9
Lymphocytes (%)	65.45	65.9	66.8
Monocytes (%)	12.85	9.85	10.8
Granulocytes (%)	21.7	24.25	22.4

In this study, UMMB supplementation raised the grazing animals' blood biochemical parameters numerically, but not significantly. This suggests that because UMMB is simple to feed, farmers may consider using it as a supplement (Morales *et al.*, 2000) [8]. Similar to a salt lick, UMM blocks are easily installed in animal sheds where animals may lick them or nibble on little pieces over time. Feeding of UMMB supplementation did not showed adverse effecs on blood biochemistry.

Conclusion

The purpose of the current study was to determine how the growth performance of 24 weaned Nellore brown ram lambs under grazing was affected by the addition of urea molasses mineral block. In general, the body weight of grazing lambs was shown to rise dramatically with supplementation, and UMMB was discovered to be a nutritious supplement for developing Nellore brown sheep. The ADG of animals supplemented with concentrate during grazing was substantially greater than that of lambs fed with UMMB, and both increased performance over the non-supplemented control group and had a substantial ($p<0.05$) favourable effect on body weight gain as well as nutrient intake. Therefore feeding UMMB shown significant increase of body weight gain and no adverse effect on blood biochemistry.

Acknowledgement

Authors deeply acknowledge the contribution and support of ATARI zone X, ANGRAU, Lam and KVK, Kalyandurg for successful execution of the work.

Conflict of Interest: None.

References

1. Ajoy M, Dutta TK, Rout PK, Roy R, Sinha NK, Sharma N. Voluntary nutrient intake and growth performance of Muzaffarnagari lambs under intensive feeding system. Indian Journal of Animal Sciences. 2007;77(10):1034-1038.
2. Currier TA, Bohnert DW, Falck SJ, Bartle SJ. Daily and alternate day supplementation of urea or biuret to ruminants consuming low-quality forage: I. Effects on cow performance and the efficiency of nitrogen use in wethers. Journal of Animal Science. 2004;82:1508-1517.
3. Debasis D, Singh GP. Effect of cold process monensin enriched urea molasses mineral blocks on performance of crossbred calves fed a wheat straw based diet. Animal Feed Science and Technology. 2003;103:51-61.
4. Forsberg NE, Al-Maqbaly R, Al-Halhali A, Ritchie A, Srikandakumar A. Assessment of molasses urea blocks for goat and sheep production in the sultanate of Oman: Intake and growth studies. Tropical Animal Health and Production. 2002;34(3):231-239.
5. Golluscio RA, Paruelo JM, Mercau JL, Deregibus VA. Urea supplementation effects on the utilization of low-quality forage and lamb production in Patagonian rangelands. Grass and Forage Science. 1998;53:47-56.
6. Karim SA, Mehta BS, Sureshkumar S, Verma DL. Growth performance and carcass traits of Bharat Merino lambs maintained under intensive feeding and grazing with supplementation. Indian Journal of Animal Sciences. 2004;74(9):977-979.
7. Karim SA, Verma DL. Growth performance and carcass characteristics of finisher lambs maintained on intensive feeding or grazing with supplementation. Indian Journal of Animal Sciences. 2001;71(10):959-961.
8. Morales AR, Galina MA, Jimenez S, Haenlein GFW. Improvement of biosustainability of a goat feeding system with key supplementation. Small Ruminant Research. 2000;35:97-105.
9. Petit HV, Castonguay F. Growth quality of prolific crossbred lambs fed silage with fish meal or different amounts of concentrate. Journal of Animal Science. 1994;72:1849-1856.
10. Singh R, Kumar S, Brar BS. Evaluation of urea molasses multi-nutrient blocks enriched with area specific mineral mixture in buffaloes. Indian Journal of Animal Sciences. 2010;80(6):561-564.
11. Snedecor GW, Cochran WG. Statistical Methods. 8th edn. The Iowa State University Press, Ames, Iowa, USA; c1994.