EFFECTS OF COMPLETE FEED BLOCKS SUPPLEMENTATION ON THE PERFORMANCE OF GRAZING MARWARI LAMBS[#]

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ABSTARCT

Twenty four Marwari lambs of similar age and confirmation were selected and divided into three equal groups. Animals of T_1 (control group) maintained on sole grazing whereas animals of T_2 and T_3 (treatment groups) were provided complete feed blocks supplementation of 200g and 400g, respectively. Growth parameter viz body weight, height, length, heart and abdominal girth were recorded periodically and data were subjected to be analyzed statistically. The mean values of total weight gain (Kg) and ADG (g/d) in groups T_1, T_2 and T_3 were 4.3±0.13 and 43.87±1.34; 6.48±0.13 and 66.19±1.34; 7.9±0.15 and 80.61±1.57. The statistical analysis of data showed significant increase ($p < 0.01$) in total weight gain and ADG of T_2 and T_3 groups due to effect of treatment. Highest growth was recorded in T_3 followed by T_2 and lowest in T_1 group. From encouraging results of growth in T_2 and T_3 group, it was concluded that supplementation of complete feed block with grazing was beneficial in growing lambs for higher economic return. Net profit for additional mutton production (Rs. 94.15/-) was higher in T_2 group as compared to the T_3 group (Rs. 74.3/-) that indicate, supplementation of 200gm complete feed block was more economical than the supplementation of 400g.

Key words: Lambs, supplementation, growth, complete feed blocks

Introduction

Livestock in general and small ruminants (sheep and goat) in particular play an important role in rural economy of India where small, marginal and landless farmers are the main beneficiaries. The sheep and goats either graze on pastures, wastelands, fallow lands etc. or stall fed to meet their nutrient requirements for various physiological state as well as level of production. The major impediment to rear sheep through intensive farming is higher cost of production. So there is need to adopt appropriate feed technology on one hand and enhanced utilization of non conventional feeds on the other hand to maximize availability and utilization of nutrients for economic sheep production. Concept of complete feed blocks which incorporate both roughages and concentrate could be a better way to utilize cheaper, non-conventional feed and waste products for small ruminant, goat has better ability to utilize them (Prasad, 2009). Ground nut straw (*Arachis hypogea*) locally called guna are easily available at reasonable price because in tube well and canal area of Bikaner district farmers are producing this straw in huge amount. Dhuria *et al.* (2004), Sharma *et al.* (2004), Singh *et al.* (2007) Netra and Pannu (2014) were reported nutritional worth of ground nut straw in their experiments with lambs. Supplementary feeding of concentrate mixture shortens the time of slaughter, increases dressing yield, improves carcass quality and sensory panel evaluation of tenderness (Mc Clure *et al*., 1994). In the study area, Sheep are maintained on grazing with resultant poor growth.Therefore an experiment was conducted to study effects of complete feed blocks supplementation on the performance of grazing Marwari lambs.

Materials and Methods

The research work was conducted in Arid Region Campus (ARC) of Central Sheep and Wool Research Institute (CSWRI), Beechhwal, Bikaner for period of august to November, 2015 (**98** Days). For the present study, existing facilities at Department of Livestock Production Management and Animal Nutrition, College of Veterinary and Animal Science, Bikaner, were also utilised.

All the feed ingredients were procured in one lot before the start of experiment. Experimental complete feed block were made using following proportion of feed ingredients: groundnut straw 30%, sewan straw 15%, guar korma 20%, maize 10%, wheat bran 10%, molasses 8%, mineral mixture 3% urea 2% and common salt 2% in feed technology unit of CSWRI, ARC, Bikaner. Sample of complete feed blocks were analyzed for proximate principles (AOAC, 2005). The proximate composition of feed block (crude protein, 18.56%; ether extract, 1.63%; crude fibre, 15.88%; nitrogen free extract, 53.10% and total ash10.83%) revealed that feed block was good quality.

Twenty four healthy lambs of uniform confirmation and about same age group (6 months, avg body weight = 23.14 kg) were selected and randomly distributed in three groups (T_1, T_2 and T_3), having 8 animal in each group. All the animals were examined for ailments and dewormed with Albendazole as a broad spectrum anti-helminthic before starting the experimental feeding. The experimental lambs were housed in their individual pens, supplied with feeding and watering troughs.

In T_1 (control group) animals were maintained on sole grazing of 8 hr, whereas in T_2 and T_3 (treatment groups) animals were supplemented 200g and 400g, respectively with the complete feed block in addition to grazing of 8 hr in evening. Clean drinking water was also provided adlib. 10 days adaptation period was allowed before data collection.

The attainment of physical biometric parameters could be an indicator of the nutritional status of the animal. Body weight and ADG was recorded weekly, whereas different body measurements including body length (point of elbow to point of hip), height, chest girth and abdominal girth were recorded

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fortnightly in morning before feeding and watering.

The data obtained in the present study were analyzed by conventional statistical procedure described by Snedecor and Cochran (1994) and means were tested for significance by DMRT as modified by Kramer (1957).

Total cost of complete feed block/kg was calculated considering the proportion of individual ingredients and their prevailing market rate (Table 1). Comparative economics was calculated at the end of **98** days experimental period. Therefore the total feed cost/animal and feed cost per kg live body weight gain was also worked out for additional weight gain as compared to the control group (Table 3).

Table 1: Prevalent market cost of feed ingredients used in complete feed block

S.No.	Name of ingredients	Cost (Rs/Quintal)
	Roughage	
1	Ground nut straw	650
2	Sewan straw	450
	Concentrate	
1	Maize	1400
2	Wheat bran	1350
3	Guar korma	1600
4	Urea	580
5	Molasses	900
6	Mineral mixture	8000
7	Common salt	350

Per kg cost was Rs 11.88/-

Results and Discussion

The mean values of total body weight gain (Kg) and ADG (g/d) in groups T_1, T_2 and T_3 were 4.3±0.13 and 43.87±1.34; 6.48±0.13 and 66.19±1.34; 7.9±0.15 and 80.61±1.57. The statistical analysis of data showed significant increase ($p < 0.01$) in total weight gain and ADG of T_2 and T_3 groups due to effect of treatment. The mean values of total gain in body length (inch) and total gain in body height (inch) in groups T_1, T_2 and T_3 were 4.97±0.07 and 3.38±0.06; 5.52±0.04 and 3.96±0.13; 5.75±0.03 and 4.27±0.04. The statistical analysis of data showed significant increase ($p < 0.01$) in total length gain and total height gain of T_2 and T_3 groups due to effect of treatment. Total gain in heart girth showed significant effect

Table 2: Mean ± SE values of different body measurements of lambs under different treatments

Particular	Treatment		
	T1	T2	T3
Body weight (kg)			
Total body weight gain	4.3±0.13^{a}	6.48±0.13^{b}	7.9±0.15^{c}
Average Daily Gain (g/d)	43.87±1.34^{a}	66.19±1.34^{b}	80.61±1.57^{c}
Body measurements (Inch)			
Initial			
Body length	22.2±0.12	22.03±0.15	22.05±0.16
Body height	20.48±0.18	20.36±.08	20.2±0.07
Heart girth	26.58±0.38	26.72±0.16	26.68±0.18
Abdominal girth	28.68±0.28	28.93±0.17	28.75±0.15
Final			
Body length	27.15±0.15^{a}	27.56±0.15^{ab}	27.8±0.14^{b}
Body height	23.87±0.15^{a}	24.32±0.19^{ab}	24.47±0.09^{b}
Heart girth	29.91±0.30^{a}	30.42±0.14^{a}	30.62±0.21^{a}
Abdominal girth	33.32±0.25^{a}	33.98±0.20^{b}	35.68±0.06^{c}
Total gain in body measurements (inch)			
Body length	4.97±0.07^{a}	5.52±0.04^{b}	5.75±0.03^{c}
Body height	3.38±0.06^{a}	3.96±0.13^{b}	4.27±0.04^{c}
Heart girth	3.32±0.10^{a}	3.7±0.22^{ab}	3.93±0.08^{b}
Abdominal girth	4.63±0.08^{a}	5.05±0.22^{a}	6.81±0.17^{b}

Means in a row with no common superscript significantly differ ($p<0.01$) (a, b, ab, c - superscripts)

Table 3: Comparative economics of different treatment group

Parameters	Group T_1	Group T_2	Group T_3
Block intake per animal during entire period of 98 days (kg)	00	19.6	39.2
Total cost of block intake per animal (Rs)	00	232.85	465.70
Initial body weight (kg)	23.13±0.42	23.18±0.79	23.12±0.84
Final body weight (kg)	27.43±0.44^{a}	29.67±0.71^{b}	31.02±0.75^{b}
ADG (g/d)	43.87±1.34^{a}	66.19±1.34^{b}	80.61±1.57^{c}
Total weight gain per animal (kg)	4.3±0.13^{a}	6.48±0.13^{b}	7.9±0.15^{c}
Additional weight gain as compare to control group	-	2.18	3.6
*Additional mutton production (kg) per animal	-	1.09	1.8
# Return of additional mutton production (Rs) per animal	-	327	540
Net profit for additional mutton production (Rs) per animal	-	94.15	74.3
Cost per unit live gain for additional weight gain (Rs/Kg)	-	106.81	129.36
Benefit : Cost ratio	-	1 : 2.47	1 : 6.26

Means having different superscripts in a row differ significantly ($p<0.01$), #Prevailing market rate of mutton 300 per kg and *Assuming 50 % dressing percentage

($p<0.05$) of treatment only in T_3 group, whereas abdominal girth revealed significant effect ($p<0.01$) of treatment only in T_3 group.

Results of this experiment indicated that supplementation of nutrients through complete feed block improve growth rate of lambs, whereas lambs reared only on grazing showed lower growth, which means grazing could not meet the nutrients requirement of growing lambs to achieve acceptable levels of growth.

Earlier, improved growth rate were also reported by Chopade *et al*. (2010); Mubi *et al*. (2011); Yadav and Khan (2011); Suresh *et al.* (2013) and Dey *et al*. (2014) as a results supplementary feeding in growing animal.

The higher cost of feed per kg live weight gain in T_2 and T_3 was due to exceptionally high prices of ingredients procured during the experimental period due to famine conditions.

Lower feeding cost of per unit live gain for additional weight gain was recorded in T_2 group animals (Rs. 106.81/-) as compared to the T_3 group animals (Rs. 129.36/-). From the results it appeared that, supplementation with 200gm complete feed block is more economical than the supplementation with the 400g.

Benefit cost ratio indicated that lower cost for unit profit gain in T_2 group (1 : 2.47 Vs 1 : 6.26) as compared to the T_3 group and supported that economic feasibility of 200g supplementary feeding system.

Conclusion and Recommendations

The experiment with lambs during monsoon and post monsoon period provide knowledge on the positive effect of using complete feed blocks as a supplement to animals on poor quality straws and grazing natural grassland. The encouraging results on physical biometric parameters and cost analysis of production further justify the need for supplementary feed along with grazing. So it was concluded that complete feed blocks can improve the efficiency of utilization of poor quality roughages and improve animal performance that otherwise could only be obtained by using greater qualities of conventional energy and protein supplements.

Although preparations and handling of blocks may be cumbersome processes but complete feed block are economic and acceptable method of feeding urea, molasses and also a cost effective approach to maximizing the utilization of locally available feed resources for better animal performance in the monsoon and post monsoon season.

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