SUPPLEMENTATION OF GRAZING SHEEP WITH BARLEY GRAIN VERSES UREA-MOLASSES BLOCKS AT MASLAKH RANGE OF BALUCHISTAN, PAKISTAN

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Summary

Sixtyfour Baluchi lambs about 5 months of age were divided into four groups with 16 lambs each. All the animals were grazed together. Group No. 1 (G-1) was kept as control i.e. on grazing only; while group No. 2 (G-2) was offered barley grain @ 200 g/head/day as supplement to grazing; Group No. 3 (G-3) was offered *ad-lib* urea-molasses block (UMB) with 6% cement and group No.4 (G-4) was fed *ad-lib* UMB having 8% cement. These UMB were fed as supplement to grazing. Experiment lasted for 105 days (July to October) in arid zone of Baluchistan. Daily per head consumption of block No.1 was found to be 92.71g; while that of block No.2 was observed to be 90.77 g. Growth rate (g/head/day) was found to be 10, 50, 33 and 15 in G-1, G-2, G-3 and G-4 respectively. Expenditure/kg bodyweight gain was found to be rupees 12.00, 3.64 and 7.74 for G-2, G-3 and G-4 respectively.
(Key Words: Urea Molasses Blocks, Lambs)

Introduction

In hilly tracts of Pakistan like Baluchistan, Northern areas and NWFP there is severe shortage of biomass. Most of the acute ranges are poor in nutrition, but livestock is the mainstay of the farmers of that area. The sheep and goats grazed on these pastures have poor reproductive efficiency and growth rates. Therefore, some sort of supplementation is required to compensate for the poor nutritional value of the pastures. Molasses, a by-product of sugar industry is abundantly available in Pakistan and is a very cheap source of energy as compared to all other similar energy feeds. About one million tons of molasses is produced every year in Pakistan. However, molasses is deficient in nitrogen and urea being the cheapest source of Non-Protein-Nitrogen (NPN), can effectively complement the molasses.

However, there is a need to develop a safe and efficient method of incorporating urea into molasses. Urea molasses blocks (UMB) technology seems to be the answer for the above given problems. The concept of using urea-molasses blocks is not new and about 25 years ago work was initiated in Australia by Bearnes (1963). The major considerations in the development of this kind of product are optimal hardness, storage ability, the ultimate cost to the farmer, as well as the feasibility of the processing method.

However, a proper and cheap binding agent is essential to make a block and it is the gelling process developed initially from the technique of uromol formation developed by Malik & Chopra (1978). Therefore, in this experiment an attempt has been made to compare two levels of cement as a binding agent and to carry out a feeding trial to evaluate the product.

The second objective of this experiment was to compare urea molasses blocks with the barley grain since in Baluchistan barley grain is usually fed as a concentrate, which has a rich energy source but is expensive too. Therefore, in this experiment it was planned to see the comparative efficiency of UMB versus barley in terms of production and economics.

Materials and Methods

Sixty four Baluchi lambs of about 5 months of age and on an average 21 kilogram of bodyweight were divided into 4 groups of 16 lambs each. Group 1 (G-1) was used as control i.e. grazing only and group 2 (G-2) was offered 200 g of barley per animal per day. Group 3 (G-3) and 4 (G-4) were offered *ad-lib* urea molasses blocks (B-1

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with 6% cement and B-2 with 8% cement) respectively. All the lambs were grazed together for 7 hours daily and on return from grazing were separated and confined to their respective pens. Blocks were offered in the galvanized iron tubs. All the barley grain offered was consumed. Blocks were weighed weekly to determine the intake of blocks by animals. The composition of B-1 and B-2 is given in table 1.

The experiment went as planned but 5 animals died during the experiment. One from treatment G-1, G-3, G-4 and two from the treatment G-2. The experiment lasted for 105 days (July to October) and the data obtained was analysed using MSTAT statistical package. The animals died were treated as missing values.

TABLE 1. CHEMICAL COMPOSITION OF UREA MOLASSES BLOCKS AND CONCENTRATES (%)

	Block No. 1 (B-1)	Block No. 2 (B-2)	Barley 200 g/d/ani.
Molasses	65	65	–
Urea	4	4	–
Common salt	2	2	–
Cement	6	8	–
Wheat bran	23	21	–
Dry matter	82.93	83.11	86.0
Crude protein	17.07	17.07	10.8
Crude fibre	2.53	2.53	5.3

Results

Barley/Blocks consumption

Total quantity of barley/blocks consumed during the experiment period of 105 days was found to be 21, 9.74 and 9.53 kg for the treatments G-2, G-3 and G-4 respectively. Block consumption was low in first 24 days of the experiment i.e. 41.25 and 50.42 g/d/animal (table 2) but raised to 259.5 and 253.3 g/d/animal towards the middle of the experiment. Then intake of the blocks droped but stayed consistent towards the last half of the experiment (table 2).

Body weight gain or loss

Results of the growth performance are shown in table 4. Mean initial weight of the animals was 21.09, 21.05, 21.35 and 21.07 kg for G-1, G-2, G-3, and G-4 respectively per head/day. ANOVA showed no significant difference between the treatments (table 4). Mean growth rates for day 24-54 show slight loss in body weight by G-1 and G-2 treatments but animals on G-3 and G-4 treatments gained weight of 0.01 kg/d/animal. Mean growth rates from day 54-84 show weight loss by all four treatments. However, mean growth rates from day 84-105 showed that animals on control were losing weight but the rest of three treatment show positive response in growth rates. Overall growth rates of the experiment showed that animals on barley treatment gave highest response and animals on control the lowest.

TABLE 2. BLOCK CONSUMPTION OVER THE EXPERIMENT (g/D/ANIMAL)

	Block No. 1	Block No. 2
Day (0- 24)	41.25	50.42
Day (24- 54)	259.50	253.30
Day (54- 84)	128.30	111.30
Day (84-105)	122.90	128.30
Overall average consumption Day (0-105)	92.71	90.77

TABLE 3. INDIVIDUAL DAILY CONSUMPTION OF VARIOUS INGREDIENTS (G)

	Block No. 1	Block No. 2
Molasses	60.26	59.00
Urea	3.71	3.63
Common salt	1.85	1.51
Cement	5.56	7.26
Wheat bran	21.32	19.06

Discussion

In Pakistan, Muller and Rollinson (1979) introduced the NPN/molasses liquid supplement licks for ruminants. The supplement was designed to provide lower levels of NPN in order to permit maximum intake of molasses. Significant improved performance of calves and dairy animals was noted.

TABLE 4. GROWTH PERFORMANCE OF LAMBS OVER THE EXPERIMENT

	G-1 Control	G-2 Barley 200g/d/ani.	G-3 B-1	G-4 B-2	S.E	Significance level
No. of observations at the end of experiment	15	14	15	15		
Average initial weight/animal (kg)	21.09	21.05	21.35	21.07	0.91	N.S
Average weight day 24/animal (kg)	23.49	23.26	23.08	22.89	1.02	N.S
Average weight day 54/animal (kg)	23.39	22.92	23.38	23.20	0.96	N.S
Average weight day 84/animal (kg)	22.30	22.28	22.07	21.89	0.93	N.S
Average weight day 105/animal (kg)	22.68	23.21	23.0	22.50	0.96	N.S
Growth rate day 0-24 (kg/day/ani.)	0.10	0.09	0.07	0.08	0.008	N.S
±SE within treatments	(0.014)	(0.012)	(0.012)	(0.015)		
Growth rate day 24-54 (kg/day/ani.)	−0.001	−0.020	0.010	0.010	0.021	N.S
±SE within treatments	(0.020)	(0.051)	(0.010)	(0.011)		
Growth rate day 54-84 (kg/day/ani.)	−0.040	−0.070	−0.040	−0.040	0.035	N.S
±SE within treatments	(0.064)	(0.048)	(0.022)	(0.010)		
Growth rate day 84-105 (kg/day/ani.)	0.010	0.050	0.030	0.030	0.011	N.S
±SE within treatments	(0.010)	(0.024)	(0.007)	(0.025)		
Growth rate overall day 0-105 (kg/day/ani.)	0.010	0.050	0.033	0.015	0.0094	N.S
±SE within treatments	(0.005)	(0.003)	(0.008)	(0.004)		

TABLE 5. ECONOMICS (RUPEES)

	G-1	G-2	G-3	G-4
Price/kg. feed	–	3.0	1.29	1.28
Total expenditure	–	63.0	12.51	12.20
Expenditure/kg Bodyweight gain	–	12.0	3.64	7.74

One U.S. dollar = 18.50 Pakistani Rupees

Slow and continuous supply of fermentable nitrogen and carbohydrates in rumen increases the digestion rates of roughages (Krebs and Leng, 1979). Estimates of the optimal concentration required for maximum rate of DM digestion and fermentation have varied widely from less than 50 mg N/l to 250 mg N/l (Satter and Slyter, 1974; Mehrez et al., 1977). Urea-molasses blocks are appropriate method of providing continuous supply of non-protein nitrogen to animals since they tend to lick blocks (Leng, 1984).

Sudana (1985) showed that supplementation of Urea-molasses block increased straw dry-matter intake by 26% and converted liveweight loss to liveweight gain significantly ($p < 0.001$). It was also found by the same worker that urea-molasses block supplement has been found superior to urea alone. Rana and Lengar (1982) and Sansoucy et al. (1972) have reported encouraging results with urea-molasses block known as "Uromol" produced at Agricultural University Ludihana, India.

Mirza et al. (1986) and Mirza et al. (1988) have shown that the growth performance of large and small ruminants is higher with the supplementation of urea molasses blocks as compared to the basal diet only.

It was expected at the begining of this experiment that animals on block treatment would show higher response compare to barley treatment. However, this could not be achieved but the reason for this is perhaps cement being used as the binding agent which depressed intake of the blocks and therefore, weight gain was depressed too. Mirza et al.(1988) showed that growth rates of 0.025 kg/d/animal when 5% cement was used in the block containing 10% urea level. Our results are quite close to Mirza et al. (1988) for the animals on block treatment at 5% cement level. When the level of cement in the block was increased to 8% (table 1) the growth rate was decreased to 0.015 kg/d/animal.

These results show that with the increase in level of cement in UMB block the consumption decreased slightly but difference in liveweight gain between the blocks treatment is about 45% (table 4). The results of this study are in line with the findings of Mirza et al. (1988) who found a growth rate of 0.025 kg/d animal when cement was used as binding agent at 5% level.

Hendrawan (1986) fed urea-molasses blocks as supplement to sheep. He found that liveweight gain of the sheep on block containing 6.9% cement and 3% urea gave 0.019 kg/d/animal liveweight gain which is very similar to our findings.

Table 5 shows economics of the treatments and it was found out that animals on treatment G-3 showed the lowest cost and animals on treatment G-4 cost higher than the treatment G-3 but feeding of barley is much more expensive than the treatment G-3 and G-4. Thus it can be concluded that feeding of urea-molasses block as supplement is more economical than barley.

We can expect further improvements in response if this sort of supplementation is tried during winter season; because of the reduced availability of biomass. Reduction of block consumption in the latter stages of experiment could have been overcome by proper feeding management i.e. keeping the UMB tube clean from faeces etc. By adding some source of phosphorous in UMB, probably growth can be further enhanced.

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