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Research Paper

Effect of Feeding Urea Mineral Molasses Block on Milk Production Traits and Economics in Jersey Crossbred Cows.

Veterinary Science

KEYWORDS : UMMB, Milk yield, Milk composition, Nutrient intake

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ABSTRACT

Twelve Jersey crossbred cows in mid lactation with almost similar age, body weight and milk yield were randomly selected from dairy farm of Rajasthan gaushala. These were divided into two groups of six animals. Control group (T1), were maintained on conventional diet of wheat straw (WS) and concentrate supplement (CS). While other group, considered as treatment group (T2), was fed conventional diet plus urea mineral molasses block (UMMB) ad libitum for 60 days. The difference among the control and treatment groups in nutrient intake was significant (p≤0.05) except for EE intake. The average milk yield (kg/d) in groups T1 and T2 were 11.86+0.19 and 13.75+0.31, respectively which differedsignificantly (p≤0.05). Fat and SNF content (per cent) of milk in groups T1 and T2 were 3.76+0.16 and 3.97+0.16; 8.2+0.09 and 9.1+0.09, respectively, which did not differ significantly between the control and treatment group. The cost per kg of milk was Rs.6.94 and 6.53 in T1 and T2 respectively.It was concluded that feeding of UMMB along with basal diet influenced nutrient intake in treatment group cows. Whereas, feeding of UMMB significantly improved milk yield and composition in treatment group.

INTRODUCTION

In Rajasthan state bajra and wheat cultivation occupy a commanding position among cereal crops in terms of greater availability as well as cheaper cost. These Low quality roughages such as cereal straws and stovers form the major part of ruminants ration. These roughages are potential source of feed energy but are poorly digested because of the resistant fiber and low nitrogen content and thus cannot meet even the maintenance needs of the ruminants. Previously report suggest that supplementation of nitrogen, quick fermentable energy and minerals together in a block form, such as urea molasses mineral block (UMMB) lick improves fermentation and utilization of organic matter (Leng 1990; Sihag et al. 2003). The availability of molasses, urea and minerals as source of energy, protein and minerals, respectively through UMMB optimize rumen fermentation and consequently increases utilization of crop residues. Hence, the present experiment was conducted to study the effect of UMMB in wheat straw based feeding systems of dairy animals on milk yield and its composition.

MATERIALS AND METHODS

Jersey crossbred cows (3rd lactation; 375kg B. wt.; 11.86kg/d milk yield) in mid lactation (130+10) were selected from dairy farm of Rajasthan gaushala and divided into two groups of six animals each to form control groups viz. control (T1) and treatment groups(T2). The control groups were maintained on conventional diet of wheat straw (WS) ad libitum and concentrate supplement (CS). The concentrate ingredients were 25% maize, 25% cotton seed cake, 35% DORB, 10% barley grain, 5% calcite. The treatment group was offered ad libitum UMMB with conventional diet. The UMMB was prepared by UMMB block making machine. The UMMB comprised 50 % molasses, 20 % deoiled rice bran, 5% guar korma, 5% cement, 10% urea, 5% mineral mixture, 5% common salt (35.73 % CP and 49.40% TDN). All the ingredients were weighed separately in an electrical balance before mixing. Liquid molasses was heated up to boiling temperature for 2-3 minutes for killing the micro-organism and easy mixing of ingredients with urea and for setting. Molasses was weighed again as the moisture was lost. Urea was broken down to ensure proper mixing and to avoid toxicity problem then urea was added to the molasses and is thoroughly mixed. Then, mineral mixture, guar korma, DORB and salt were added and mixed continuously. Water and cement were added in the ratio of 2:4 to make which is then added to molasses mixture and thoroughly stirred to obtain a consistent paste and prepared UMMB using hydraulic pressure by UMMB machine at 1000 psi. The daily feed intake, UMMB intake and milk yield were recorded. The experiment was conducted for 60 days.

The samples of CS and wheat straw were analyzed for various proximate principles (AOAC, 1995). Milk samples collected daily were subjected to fat analysis by Gerber`s method (BIS, 1977) and SNF was calculated by using the formula % SNF = CLR/4+0.2fat%+0.14(Ramasamy et al; 1999). The data obtained on various parameters studied during this experimental trial were subjected to statistical analysis as described by (Snedecor and Cochran, 1994) and the treatment means were compared by Duncan's multiples range test (Dunken,1995).

RESULTS AND DISCUSSION

The concentrate supplement formulated by the Rajasthan gaushala comprised 35% grain, 25% oil seed (cotton seed) and 35% milling byproduct (rice polish and DORB). The UMMB fed to experimental animals contained molasses 50%, DORB 20% as energy source and urea (5%) as N2 source. The chemical composition of CS, WS and UMMB is given in Table 1. TheCP (14.35%) content of CS fed by the gaushala was slightly lower than any of the CS formulated by the most of the scientists to feed the livestock in their experiments. The nutritive value of the WS recorded in this study was very much similar to the values reported by Raman et al. (2010). Similarly, the CP content of UMMB was similar to the values reported by Raman et al; (2010).

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Table 1. Chemical composition (% DM basis) of concentrate supplement, wheat straw and UMMB

Particulars	Concentrate Supplement	Wheat Straw	UMMB
Crude protein	14.35	4.40	35.73
Ether extract	2.89	0.85	1.70
Crude fiber	12.17	41.73	1.95
Nitrogen free extract	56.78	44.50	44.60
Total ash	7.78	8.44	27.27
NDF	44.82	79.11	12.90
ADF	22.36	58.62	09.44

The voluntary intake of DM through WS in UMMB supplemented group increased significantly ($p \leq 0.05$). The average daily intake of UMMB (kg/d) was 0.245 in treatment group (Table 2). Ghebrehiwet et al. (1988) reported no effect of UMMB on intake of basal ration while Chauhan et al. (1997) reported that the intake of straw based ration was more pronounced in UMMB supplied group. The total DMI (as kg/d or per cent of B. wt.) was statistically different in UMMB fed group whereas Zile et al. (2007b) reported no change in the total DMI in UMMB fed group maintained on wheat straw. The CP intake was observed significantly between control and treatment group. Whereas CF, NFE intake statistically different between groups. Ramesh et al. (2009) also reported similar result. The CP digestibility was highest in T2 group, however there was no significant difference, which shows that nitrogen was equally digested in experimental group as well as control group. Thus, the source of nitrogen had no effect in CP digestibility. The EE digestibility was similar in all groups. Sihag et al. (2007) also reported similar digestibility of CP and EE in control group and UMMB fed group of lactating crossbred cows. Significantly higher digestibility of crude fibre in the UMMB supplemented group (T1). Similar trend was trend was observed in the digestibility of ADF and NDF. These results indicated the stimulation of growth of cellulolytic micro-organism, which might have resulted in improved digestibility of these nutrients. Sihag et al. (2003a) reported that feeding of UMMB with wheat straw as the sole source of roughage encouraged the proliferation of normal microbial population in the rumen. The significant increase in the milk yield by 15.94% in the treatment group suggested that the supplementation of UMMB improved the milk yield. These results were in agreement with the earlier studies by Chauhan et al. (1997) and Ghebrehiwet et al. (1994).

Table 2. Average intake of nutrients (kg/d) and UMMB in Control group (T1) and Treatment group (T2)

Particular	Control group(T1)	Treatment group(T2)
DMI		
Wheat straw*	5.30 + 0.02	6.00 + 0.03
Concentrate	3.20 + 0.01	3.20 + 0.01
UMMB	-	0.245 + 0.00
Total DMI*	8.50 + 0.05	9.20 + 0.07
Total CPI*	0.69 + 0.10	0.80 + 0.13
Total EEI	0.14 + 0.01	0.15 + 0.04
Total CFI*	2.60 + 0.09	2.90 + 0.13
Total NFEI*	4.17 + 0.03	4.60 + 0.09
Total TAI*	0.70 + 0.02	0.83 + 0.02

*($p \leq 0.05$), means with different superscripts in a row differ significantly.

The major milk components like fat and SNF content of the animals fed with UMMB were not significantly over control group. These results were similar to the studies conducted on buffaloes by Zile et al, 2005; 2007b where there was no improvement in any of the milk component in UMMB fed groups.

Table 3. Average milk yield (kg/d), 4% FCM yield (kg/d), MILK FAT% AND SNF % FOR CONTROL GROUP (T1) AND TREATMENT GROUP (T2)

Particular	Control group(T1)	Treatment group(T2)
Milk yield*	11.86 + 0.19	13.75 + 0.31
4% FCM yield*	11.43 + 0.19	13.69 + 0.31
Fat	3.76 + 0.16	3.97 + 0.16
SNF	8.30 + 0.09	8.95 + 0.09

*$p<0.05$, means with different superscripts in a row differ significantly.

Cost of milk production

The cost of per kg milk production (Table 4) showed reduction by 6.28% in treatment group (T2)due to the supplementation of UMMB. The ad libitum UMMB supplementation to lactating crossbred cows can reduce the cost of production. Hence, it was concluded that the improvement in nutrient intake, milk yield and composition and lower cost of production in UMMB supplemented group in cows could easily be achieved as UMMB supplied the adequate nutrients for better performance in dairy animals of medium level of production. Similarly, maintenance of protein and energy balance in the diets of dairy animals is also one of the main factors to be considered to augment the productive performance of lactating animals.

Table 4. Economics of milk production

	T_1	T_2
Total Intake/day (kg)	53.50	56.90
Total milk/day (kg)	71.16	82.50
Total expenditure/day (Rs.)	493.80	539.19
Total income/day (Rs.)	2134.80	2475
Net profit/day (Rs.)	1641	1935.81
cost/kg of milk (Rs.)	6.94	6.53

The cost of UMMB wasRs.17/kg block

REFERENCE

AOAC. 1995. Official Methods of Analysis, 16th ed. Assoc. Off. Anal. Chem., Washington, DC. USA. | BIS. 1977. Determination of fat percentage by Gerber method. ISI:1224 (part-1), Bureau of IndianStandards, ManakBhawan, New Delhi. | Chauhan, T.R., R. Gupta, S.S. Dahiya and B.S. Punia. 1997. Effect of supplementing urea molasses blocks in the ration of buffaloes on nutrient utilization and milk production. Indian J. Anim. Sci. 67:418-421. | Duncan, D.B., (1955). Multiple range and multiple F tests. Biometrics, 11: 1-42. | Ghebrehiwet, T.R., M.N.M. Ibrahim and J.B. Schiere. 1988/1994. Response of growing bulls to dietscontaining untreated or urea treated rice straw with rice bran supplementation. Biolog. Wastes. 25:269-280. | Raman, R.S., Chahal, S.M. and Sihag, Z.S. 2010. Effect of supplementation of urea molasses mineral blocks on growth, Nutrient Utilization and Metabolites in Growing Buffalo Heifers.Indian J. Anim. Sci. 27(2):116-121. | Ramasamy, D., Shibu, A.V. and Gopi, H. 1999. Dairy Technologists` Handbook, International Book Distributing Co. Lucknow, U.P. | Ramesh, B.K., Thirumalesh, T. and Suresh, B.N. 2009. Effect of Feeding Urea Mineral Molasses Block on Milk Production, Milk Composition and Onset of Estrus in Dairy Animals. Indian J. Anim. Sci. 26(4):322-326. | Sihag., S.M. Chahal and B.S. Punia. 2003a. Microbial population in rumen of buffaloes given urea molasses mineral blocks (UMMB) containing different energy and protein sources with wheat straw. Indian Buffaloes J. 1(1): 11-14. | Snedecor, G.W. and W.G. Cochran. 1968. Statistical Methods. 6thedn. Iowa state Univ. Press. Ames. Iowa. USA. | Zile, S. Sihag., B.S. Punia and Nand Kishore. 2005. Effect of feeding urea molasses mineral blocks on nutrient utilization, milk production and its composition in buffaloes. Indian Buffaloes J.3:39-42. | Zile, S. Sihag., B.S. Punia and Nand Kishore. 2007. Effect of feeding urea molasses mineral blocks on productive performance of lactating buffaloes. Indian J. Anim. Sci. 24(1):24-26. | Zile, S. Sihag., B.S. Punia and Nand Kishore. 2007b. Effect of feeding urea molasses mineral blocks onproductive performance of lactating buffaloes. Indian J. Anim. Sci. 24:24-26.