http://www.pjbs.org

PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Pakistan Journal of Biological Sciences 7 (9): 1523-1525, 2004
ISSN 1028-8880

Effect of Urea Molasses Multi-nutrient Blocks Supplementation of Dairy Cows Fed Rice Straw and Green Grasses on Milk Yield, Composition, Live Weight Gain of Cows and Calves and Feed Intake

[1]Yeasmin Akter, M.A. Akbar, M. Shahjalal and T.U. Ahmed
[1]Department of General Animal Science and Nutrition,
Dinajpur Government Veterinary College, Dinajpur, Bangladesh
Department of Animal Nutrition, Bangladesh Agricultural University, Mymensingh, Bangladesh

Abstract: The effects of supplementation with urea molasses multi-nutrient blocks of dairy cows fed rice straw and green grasses on milk yield, composition, live weight change of cows and calves and intake were studied under village condition. The cows were offered 250 g UMMB per cow per day. The animal were divided into two groups and randomly assigned to two dietary treatments. The control group (A) received diet containing rice straw, green grasses, wheat bran, rice polish and mustard oil cake. However, the supplemented group (B) received UMMB in addition to normal diet, given to the control group. Supplementation of blocks to cows also receiving straw based diets increased milk production from 2.86 to 4.43 L/d ($P<0.01$) and live weight of calves from 20.29 to 25.57 kg ($P<0.05$). But did not significantly increased live weight, condition score, milk composition and intake of cows. This increase in milk yield is mainly explained by increased intakes of energy and nitrogen. UMMB was as recommended to be used as a strategic supplement in lactating dairy cows especially when fed on low quality roughages or crop residues.

Key words: UMMB, rice straw, green grass, milk, dairy cows, calves

INTRODUCTION

In Bangladesh a major constraint to ruminant livestock is the severe scarcity of feeds and fodders both in quantity and quality. Due to high pressure on land for crop production for human consumption, farmers cannot spare land for fodder production. Cattle and buffaloes mainly subsist on straw based diet with limited supplementation of green fodder and little or no concentrate. So the productivity of ruminants in this region is severely constraints by inadequate nutrition, which interact growth and reproduction rates. Rice straw is the cheapest available roughage source for feeding ruminant livestock in Bangladesh. The animal productivity in Bangladesh mainly depends on the efficient utilization of rice straw having low nitrogen content and digestibility. Nutritive value of straw can be improved by proper chemical treatment and supplemented with nitrogen and energy. It has been reported that if urea-molasses is supplied to the animals with straw then feed intake[1], digestibility and palatability of straw increases. Supplementation particularly with high quality protein is often necessary to maintain adequate productivity[2]. Protein sources in the diet, largely meet the protein requirement of animals. It can provide additional N through rumen fermentation but it is inadequate and costly in Bangladesh. Non-protein nitrogen (NPN) supplements are cheap, readily available and can improve the nutritional status of low quality fibrous feed. Urea is a NPN substance. To mitigate under nutritional problem of cattle can be corrected by using urea molasses multi-nutrient block, which is a feed block that can supply ammonia from urea, soluble sugar from molasses, minerals from CaO and some amino acids from wheat bran. Supplementation with urea molasses multi-nutrient blocks (UMMB) has shown a beneficial effect on growth performance, milk yield and intake[3,4]. By considering the above factual situation and information the objectives of this study were carried out to investigate, the effect of supplementation with UMMB on feed intake and productivity of dairy cows.

MATERIALS AND METHODS

Experimental animals and supplementation: The proposed research was carried out in the surrounding villages of Muktagacha Upazilla, Mymensingh. The experiment was done for a period of 45 days with 14

Corresponding Author: Yeasmin Akter, Lecturer, Department of General Animal Science and Nutrition, Dinajpur Government Veterinary College, Dinajpur, Bangladesh E-mail: yakter_2003@yahoo.com

indigenous dairy cows to study the effect of UMMB in dairy cows and its impact on different parameters (feed intake, growth, milk yield and milk composition). Animals were selected based on milk production, stage of lactation. They were grouped into 2 each having 7 animals. The basal ingredients used in formulating ration for each group of animals were straw, green grass (roadside), wheat bran, rice polish and mustard oil cake. These basal feeds were supplied unsupplemented to one group of animals designated as control (group A) another group was supplemented with urea molasses multi-nutrient block (UMMB) only (group B). This was done in a random manner. The design of experiment followed in this study was Completely Randomized Design.

Preparation of UMMB: Molasses (39%), rice polish (20%), wheat barn (20%), urea (10%), lime (6%) and common salt (5%) were used for the preparation of UMMB. Firstly exact amount of molasses was taken in a dish and then mixed with salt, urea at the previous night. Then wheat bran, rice polish, and lime powder were added in above molasses mixture and mixed properly to make a thick pest with a sticky consistency. Then this mixture was placed in wooden box and compressed with weight of suitable size to make more compact blocks. After solidification of the blocks they were ready for distribution. The weight of each UMMB was 2 kg, respectively.

Feeding and management of animals: All 14 lactating cows were stall fed under roofed shed. Each animal was supplied with the quantity of ration based on its maintenance and milk production. The farmers prepared the rations according to the recommendation of the researcher. UMMB were fed to the experimental dairy cows (group B) at the dose rate of 250 g/day/head. Blocks were supplied to the animal in a wooden box for proper licking. All the cows of both treated and control groups had free access to normal feed and clean drinking water. They were fed twice daily, milked once a day in the morning. The calves were tied up at night and were allowed to suckle their dam during daytime after milking. All the farmers kept their animals in shed with individual manger and brick soling floor. The overall management systems for all 14 cows were similar.

Sampling and analysis: All feed samples were collected from the farms and were analyzed for dry matter (DM), crude fibre (CF), crude protein (CP) and ash. Milk samples were collected from each animal and were analyzed before the start of experiment and just before the end of the study. These were analyzed for milk protein and milk fat following Kjeldahl method and Gerber method, respectively.

Record keeping: Initial body weight of each cow of all groups was taken at the beginning of the experiment till the end of the experiment, with the help of weigh band. Daily intake of both roughages and concentrates were recorded by visiting the farm. Daily milk yield of individual cow was recorded daily.

RESULTS AND DISCUSSION

Effect of UMMB on growth performance and body condition score: Effect of feeding UMMB on the live weight and body condition score of cows are shown in Table 1. The initial average live weight of dairy cows before block licking in-group A (control group) and B (UMMB group) were 196.43 202.14 kg, respectively. The final live weight of all cows in the treated groups was 204.57 kg and in control group was 196.29 kg. There was no significant difference between control and treated group but the highest live weight was recorded in UMMB group. Several workers observed better live weight gain in animals fed different types of urea molasses supplementary ration[5,6] which indicates that feeding UMMB to the animals results in increased growth performance. It has been expected that the UMMB should have significantly increased live weight of animals. The average live weight recorded for blocks (UMMB) feeding in the present study were not significant. This variation might be due to variation in genotype, age and managemental condition, variation in composition of UMMB and the experimental animals were lactating. If the animals were of growing stage, there would have been more live weight and there would have possibility of large variation in the weight gain values between the treatment groups.

Before block feeding average body condition score of all cows of group A (control group) and B (UMMB group) were 2.71 and 2.71, respectively (Table 1).

Table 1: Group averages for production parameters and level of significance

Parameters	Control	UMMB	Level of significance
Initial milk yield (L/d)	2.86	2.86	-
Final milk Yield (L/d)	1.93	4.43	**
Milk protein (g/100 g)	3.88	3.90	NS
Milk fat (g/100 g)	4.43	4.60	NS
Initial live weight (kg)	196.43	202.14	-
Final live weight (kg)	196.29	204.57	NS
Initial condition score	2.71	2.71	-
Final condition score	2.79	3.00	NS
Initial calves weight (kg)	20.43	20.29	-
Final calves weight (kg)	21.71	25.57	*

However, body condition scores recorded on day 45 of the experiment were higher in cows fed UMMB (3.00) compared to those fed control diet (2.79) but no significant difference was observed between control and treated group.

Although feeding of UMMB could not make significant differences in body condition score of the lactating animals, the non-significantly increased condition score resulting from UMMB suggests that feeding of UMMB had a positive effect on condition score of dairy cows because they got additional nutrients from UMMB such as energy, nitrogen, minerals etc. On the other hand the initial live weight of calves in UMMB and control groups were 20.43 and 20 29 kg and the final live weight were 21.71 and 25.57 kg (Table 1). There was significant difference ($P<0.05$) between control and treated group. Highest live weight was found for UMMB group.

Effect of UMMB on milk yield and milk composition: The effect of feeding UMMB on milk yield of dairy cows under rural condition was depicted in Table 1. The average daily milk yield prior to block feeding was 2.86 L for control and UMMB group. During the experimental period of 45 days average daily milk yield (litres) for control and UMMB groups were 1.93 and 4.43, respectively. There was significant difference between control and treated group. Highest milk yield was found for UMMB. So it is clear that UMMB feeding has significant effect on milk yield of cows as described by Wanapat *et al.*[4]. In the present study protein and fat percent of milk in the treated group increased slightly compared to initial values (Table 1). But no significant result was found in two groups. The results of the scientists working on the change in milk composition suggest that it depends on many factors most important of which is the composition of the diets. The diets containing more protein and fat will increase protein and fat contents of milk[7]. However, conflicting results are also reported by some authors that the feeding had no significant effect on milk composition[8,9].

Effect of UMMB on feed intake: In this experiment with dairy cows fed straw based diets and green grass with and without UMMB supplementation, but did not significantly increased of feed intake for the diet supplemented with UMMB. It has been showed that UMMB lick supplementation of a straw based diet increases digestibility, feed intake, live weight gain and the net return and that macro and micro elements can be easily incorporated in the blocks thereby correcting multi-nutritional deficiencies of ruminants in developing countries[4,9]. It can be concluded that urea molasses multi-nutrient block supplementation of straw based diets increases live weight of cows and calves, condition score, milk production and intake in dairy cows.

REFERENCES

1. Thu, N.V. and P. Uden, 2001. Effect of urea molasses cake supplementation of swamp buffaloes fed rice straw or grasses on rumen environment, feed degradation and intake. Asian–Australasian J. Ani. Sci., 14: 631-639.
2. Knox, M. and M.W. Zahari, 1997. Urea molasses blocks for parasite control. Proceedings of a Workshop Organized by FAO and the Danish Centre for Experimental Parasitology Ipoh, Malaysia, pp: 5-12 October, 1997.
3. Shamilima, G.Y.C., N.J. Siulapwa, H.W. Witola, K. Muzandu and G. Sikazwe, 2000. Field evaluation of feed supplementation package for improving milk production using locally available feed resource in Zambia. Indian J. Vet. Res., 9: 55-58.
4. Wanapat, M., A.Petlum and O. Pimpa, 1999. Strategic supplementation with a high quality feed block on roughage intake, milk yield and composition and economic return in lactating dairy cows. Asian-Australasian J. Ani. Sci., 12: 901-903.
5. Alderete, R., H. Losada, M. Osorio and E. Arand, 1995. Effect of molasses/urea and blood meal supplementation on the heifers. Cuban J. Agril. Sci., 29: 29-38.
6. Saadullah, M., D.R.D. Sarker, M.A. Huq, A. Samad and S. Islam, 1994. Study on the effect of replacement of wheat bran by urea molasses block lick in straw base diet on the performance of draught cows. Bangladesh J. Ani. Sci., 23: 163-168.
7. Khan, M.A.S., S.K. Bain and S.A. Choudhury, 1990. Study on the effect of feeding urea treated rice straw supplemented with different levels of fishmeal as by pass protein in early lactating cows. Bangladesh J. Ani. Sci., 19: 119-130.
8. Ahmed, T.U., A.K.M.A. Mannan, M.S. Rahman and A. Haque, 1982. Study of urea treated rice straw in milk production. Bangladesh J. Ani. Sci., 11: 20-27.
9. Teller, E., J.M. Godeau and R.D.E. Baere, 1980. Effect of administration of urea on the composition of milk. Dairy Sci. Abst., 43: 220.
10. Yan, T., D.J. Robert and J. Higginbotham, 1997. The effects of feeding high concentrations of molasses and supplementing with nitrogen and unprotected tallow on intake and performance of dairy cows. J. Ani. Sci., 64: 17-24.