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Effect of Urea Molasses Straw on the Productive and Reproductive Performance of Indigenous Cows under the Village Conditions of Bangladesh

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Abstract: Thirty-six indigenous postpartum cows were given dry straw *ad libitum* + 1.5 kg concentrates (control) or UMS *ad libitum* + 1.5 kg concentrates (treated). Cows were stall fed. Calves were tied up at night and allowed to free access or suckling to the cows during the whole day. The cows were milked only in the morning. Live weight change of cows and calves were recorded monthly and milk yield was recorded daily. The reproductive performance of cows was also studied. Live weight change of cows -57.40 and 37.75 g/d ($P < 0.05$); milk yield of cows 1.83 and 2.52 kg/d ($P < 0.01$); calf weight gain 96.99 and 139.35 g/d ($P < 0.01$); calving to first service interval 182 and 113 days ($P < 0.01$) ; calving to conception interval, 210 and 134 days ($P < 0.01$) and number of services per conception 2.11 and 1.94 ($P > 0.05$), for controlled and treated groups respectively. It is concluded that UMS can be fed for improving the productive and reproductive performance of indigenous cows under the village conditions of Bangladesh.

Key words: Indigenous, productive, reproductive, cow, straw

Introduction

Livestock plays an indispensable role in the traditional agrarian and largely subsistence economy of Bangladesh (Haq, 1992). The landless and marginal farmers largely depend on livestock for their survival (Ahmed, 1992).

Cattle population of Bangladesh is about 23.7 million heads (Anonymous, 1992), 23.2 million and 22.06 million (Anonymous, 1997). Among these, about 0.25 million are purebred and their crosses and the rest are indigenous low producing Zebu type (Sultana, 1995).

It is reported that 75% of the world's cattle population is in the developing countries (Asia, Africa and Latin America), but it contribute only 21% of the world's milk production and 34% of the beef production (Rahman, 1992). The annual milk production in Bangladesh is about 1.4 million metric ton. About 0.2-0.3 million metric ton powder milk is imported every year.

The main constraint in livestock production in Bangladesh is the acute shortage of feeds and fodder for our animals. Straw is the important crop residue, that contributes the major portion of the fibrous part of the diet of ruminants in the tropical and subtropical countries. In Bangladesh, out of total 29.1 million tons of roughage available for ruminants, rice straw contributes around 23.57 million tons (81%) and green grasses only 1.6 million tons (Tareque, 1985). Therefore, rice straw is the basal feed for ruminants with low nutritive value and low digestibility (Saadullah *et al.*, 1981).

The animal productivity in Bangladesh largely depend on the efficient utilization of this poor quality rice straw with low nitrogen content and low digestibility due to high lignin, silica and oxalate content. That is why the reproductive performance of our dairy cows are not satisfactory.

It was found that if urea and molasses mixture is supplied to the animals with straw then feed intake and digestibility of straw increases (Tareque, 1985). Urea is a non-protein nitrogenous compound that can be used in the ruminant's rations as protein supplement. Rumen micro flora converts urea to protein. Molasses is a sugar mill by product, which can be obtained easily and can provide energy, minerals and vitamins very quickly. It adds sweet flavour and odour and has a special value increasing the palatability and efficiency of feed. The use of non-protein nitrogenous component incorporated with molasses is an economical means of providing suitable protein and energy for ruminant. With this idea keeping in mind the present study was undertaken with the objectives, I) to study the effect of UMS on the milk production of indigenous cow, II) to study the effect of UMS on live weight changes of indigenous cows and calves and III) to study the effect of UMS on reproductive performance i.e., calving to first service interval, calving to conception interval and service per conception.

Materials and Methods

The experiment was conducted at Farming System Research Development (FSRD) site under Sugarcane Research and Training Institute, Ishurdi, Pabna from 1999-2001 June.

A comparative study was conducted for a period of 11 months (December'8 to October'99 with indigenous lactating cows. They were divided into two groups (control and treated group) while each group consists of 18 cows. All the selected animals were being used for both dairy and draft purposes by the farmers. The cows were milked only in the morning. The experimental cows were divided into two groups. One group for normal dry straw feeding another group for urea molasses straw feeding, the calves were tied up at night and allowed to free movement or suckling to the cows during the whole day. The individual weight of the cows (129-238 kg) and calves (12-39 kg) were recorded before starting the experiment. All the cows were stall fed. Managemental conditions of all cows were almost the same. Veterinary treatments were given to the experimental cows if necessary.

At first urea, molasses and straw were weighed. A polythene sheet was spread over the earth, then the straw was scattered on it. The urea was placed in a dish and dissolved with water. Molasses was added with urea solution and mixed thoroughly by a stirrer or stick. Urea molasses solution was poured into a watering can from the dish and sprayed over the straw and mixed vigorously by hand. The composition of urea molasses straw is 3: 15:82.

The UMS was preserved into a big polythene bag or jute bag for future use, but not used for more than 3 days. Because, after 3 days fungi are grown slowly, being harmful to animal. Urea molasses straw was fed *ad libitum* to all the cows and calves of treated group and normal dry straw was fed to control group. All the cows and calves in both control and treated groups were fed the same amount of concentrate mixture and *ad libitum* drinking water.

Parameters studied: The following parameters were studied from this experiment.

a) Body weight changes of cows and calves, b) Milk yield of cows, c) Calving to first service interval, d) Calving to conception interval and e) Service per conception.

Chemical analysis of UMS: Chemical analysis of UMS was done in the Nutrition Laboratory of Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka. Crude protein was determined by Kjeldahl method. The percentage of nitrogen was then multiplied

by 6.25 to obtain the per cent of CP. The chemical composition of UMS was DM 72.8%, OM 85.0%, CP 10.0%, ADF 40.2% and Ash 16.7%.

Statistical analysis: The experiment was carried out in completely randomized Design (CRD). Statistical analysis of experimental data were done. At first treatment effect was calculated in accordance with Snedecor and Cochran (1967). Later analysis of variance was estimated according to Alder and Roessler (1968).

Results and Discussion

The experiment was done to evaluate the potential effect of UMS on the productive and reproductive (calving to first service interval, calving to conception interval and service per conception, calf weight gain) performance of indigenous cows, those have discussed in the following sub-headlines.

Live weight change of cows: The average live weight changes of cows are shown (Table 1). The average live weight change of control and treated groups were -57.40 ± 120.76 and 37.75± 110.89 g/d, respectively. Statistical analysis showed that there was a significant difference ($P < 0.05$) between live weight change of two groups. The higher live weight gain of treated group than that of control ones was possible by taking more DMI and by the positive effect of UMS. Moreover, it was seen that lactation month wise live weight change (gain or loss) of treated group was always much greater than that of control group. The probable cause is the catalytic effect of urea and molasses from UMS. Several researchers observed better live weight gain in different types of cattle by feeding urea molasses straw (Huque and Chowdhury 1995 and Trung *et al.*, 1989).

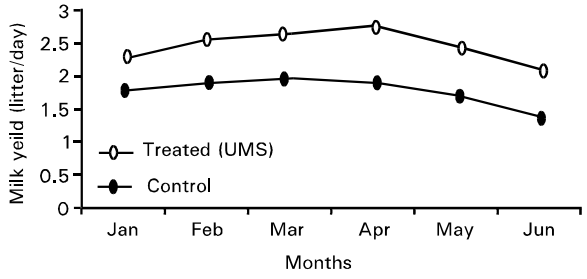

Fig. 1: Effect of UMS feeding on milk yield

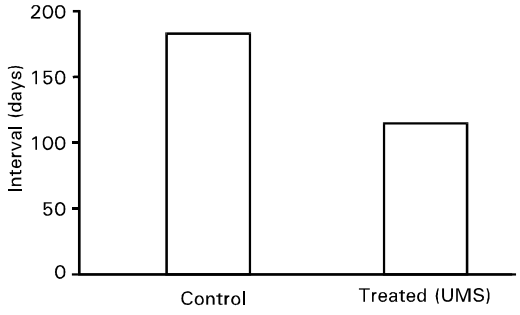

Fig. 2: Effect of UMS on calving to first service interval

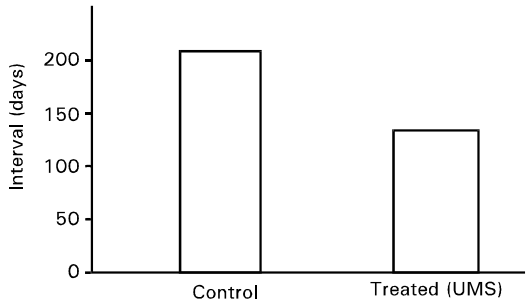

Fig. 3: Effect of UMS on calving to conception interval

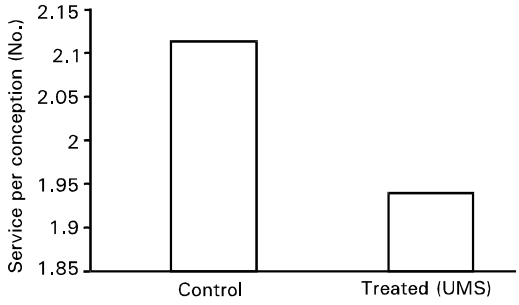

Fig. 4: Effect of UMS on service per conception

Milk yield: Average milk yield of control and treated groups were 1.83 ± 0.79 and 2.5 ± 1.01 kg/d, respectively (Table 1; Fig. 1). This result was partially supported by Islam and Huque (1995). The difference of milk yield between two groups of cow was statistically significant ($P < 0.01$). In this experiment, although the cows of both control and treated group produced more milk than initial production, nevertheless treated group produced about 42% more milk than that of control group. Moreover, the lactation month wise milk production of treated group was always much greater than that of control. The results indicate that UMS has a positive effect on milk production of indigenous cows. So many researchers described the positive effect on milk yield of cows by feeding urea and molasses supplementation (Kunju, 1986; Saadullah, 1991; Davison *et al.*, 1987).

Calf weight gain: The average calf weight gain of control and treated groups were 96.99 ± 15.30 and 139.35 ± 29.69 g/d, respectively (Table 1). The result was supported by Shahoo *et al.* (1990) and Daniel *et al.* (1986). Statistical analysis showed that

Table 1: The summary of performance of animals of control and treated groups

Parameters	Control Mean ± SD	Treated Mean ± SD	Level of significance
Average live weight change of cows (g/d)	-57.40± 120.76	37.75± 110.89	*
Average milk yield (kg/d)	1.83± 0.79	2.52± 1.01	**
Average calf weight gain (g/d)	96.99± 15.30	139.35± 29.69	**
Average calving to first service interval (days)	182.0± 77	113.0± 56	**
Average calving to conception interval (days)	210.0± 61	134.0± 54	**
Average number of services per conception	2.11.0± 1.32	1.94± 1.0	NS

NS = Non Significant * = Significant at 5% level of probability ** = Significant at 1% level of probability

there was a significant difference ($P< 0.01$) between calf weight gain of two groups. The higher weight gain was possible by taking UMS and concentrate mixture. The calf weight gain was not so satisfactory in the early period and obtained better performance in later period of the experiment. Similar results were obtained by Daniel *et al.* (1986). Because, in the later period, calf's rumen was well developed and it was efficiently able to utilize the UMS.

Calving to first service interval: The average calving to first service interval of control and treated groups were 182 ± 77 and 113 ± 56 days, respectively (Table 1; Fig. 2). This result is partially supported by Ghosh *et al.* (1993).

The difference between two groups were statistically significant ($P < 0.01$). Calving to first service interval of treated group was decreased due to the effect of UMS.

Calving to conception interval: The average calving to conception interval of control and treated groups were 210 ± 61 and 134 ± 54 days, respectively (Table 1; Fig. 3).

Statistical analysis showed that the difference between two groups of cow was significant ($P < 0.01$). Optimum economic fertility could be achieved with an average interval of 85 days calving to conception De Kruif (1978). Although the results of this experiment were not fulfilled the optimum calving to conception interval, but treated group reduced the interval than that of control group probably by the effect of UMS.

Service per conception: The average number of services per conception of control and treated groups were 2.11 ± 1.32 and 1.94 ± 1.0, respectively (Table 1; Fig. 4).

The observed value of number of services per conception in both control and treated groups were higher than the optimum (1.3) as reported by De Kruif (1978). There was no significant difference between two groups. Because, the number of services per conception may be influenced by physiological condition of sire and dam, percentage of viable sperm, semen preservation methods, insemination techniques, proper heat detection of cow, skillness of inseminator etc. Urea molasses straw has positive effect only on physiological condition of dam of treated group but other conditions were similar in both control and treated groups. Therefore, the difference between two groups was not significant. From this study it can be concluded that UMS has a positive effect on the productive and reproductive performance of indigenous cows under the village condition of Bangladesh.

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