

Urea Molasses Blocks to improve milk production and reproductive performance of cross-bred dairy cattle under smallholder farm condition in Bangladesh

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Introduction Crop residues constitute more than 90% of the feed resources available for ruminant livestock in Bangladesh. The major crop residue is rice straw, which serves as the main feed for dairy cattle. Low quality straw based diets, feed scarcity, poor reproductive management and diseases results in a substantial decrease in milk production and reproductive performance of dairy cattle. Previous studies indicated that delayed puberty and extended calving to conception interval are the characteristics of cross-bred cattle (Alam and Ghosh 1994). Rice straw is severely deficient in protein and mineral content and, therefore, unable to provide proper nourishment for ruminants. Milk production in Bangladesh is mainly carried out by smallholder farmers. Most of the cross-bred cattle are crosses between local and zebu cattle (e.g. local x Sahiwal) or local cattle and *bos taurus* (e.g. local x Holstein Friesian). Such crosses are particularly common on small and medium size farms. Feeding urea molasses blocks (UMB) together with rice straw has been found to be a satisfactory method of improving digestibility and results in improvement in the productive and reproductive performance of cross-bred cattle (Hendratno, 1999). This experiment was conducted to study the effect of UMB on milk production and reproductive performance of cross-bred cattle.

Materials and methods Smallholder dairy farms rearing cross-bred cattle in a peri-urban area of Mymensingh district were used in this study. Management, environmental conditions and feeding practices were similar on all farms. Cross-bred cows (local zebu x Holstein Friesian and local zebu x Sahiwal), between the second and sixth parity, age 4-9 years, and healthy were used. Eighty cows from 35 smallholder farmers were included, most stall-fed with straw based diets and cut and carry grass depending on the availability. Cows were fed mainly rice straw with seasonal green grass. Wheat bran, sesame oil cake, rice polishings or rice bran and common salt were also supplied to the animals. Cows were dewormed at the beginning of the experiment. The composition of the UMB was 39% sugar cane molasses, 20% wheat bran, 20% rice polishings, 10% urea, 6% lime powder (CaO), and 5% common salt (NaCl). Blocks were supplied to animals twice daily within a wooden box which allowed licking, not biting. All cows with access to UMB had free access to the normal feeds available to the other cows and all cows had access to clean water. Milk samples were collected weekly, from 15 days after calving, for estimation of progesterone (P4) level by Radioimmunoassay (RIA), until oestrus detection. The FAO/IAEA RIA Kit was used to determine the P4 concentration in milk. Artificial insemination (A.I.) was available. Milk samples were then taken on the day of service (day 0) (sample-1), 12-14 days (sample-2) and 20-23 days (sample-3) post A. I. until confirmation of pregnancy. Oestrus behavior was monitored visually. Confirmation of pregnancy was carried out by rectal palpation. Milk yield data, adjusted for stage of lactation, (e.g. to onset of ovarian activity, first oestrus and conception) and calving interval was analyzed statistically, as a randomized complete block design (RCBD) with two factors. Duncan's Multiple Range Test (DMRT) was used to measure the differences between treatment means.

Results The average milk yields were 5.61 and 6.48 kg/d for control and UMB group in Holstein cross (HC) and 3.95 and 4.72 kg/d for control and UMB group in Sahiwal crossbred (SL) cows (Table 1). There were significant differences ($P<0.05$) between control and UMB group in HC and SL cows and also significant difference ($P<0.01$) between two cross-bred cattle in milk production of 180 days. Interval from calving to 1st P4 rise in HC and SL were reduced by 11 (93 vs 82) and 39 (119 vs 80) days, calving to first oestrus were reduced by 39 (162 vs 123 and 151 vs 112) days in both HC and SL cows but statistically there were no significant difference in control and UMB group or between two crossbred cattle for both parameters. There were significant difference ($P<0.01$) in calving to conception in HC (233 vs 170) and in Sahiwal (209 vs 143) cows. Calving interval also significant ($P<0.01$) in both HC (516 vs 453) and SL (492 vs 425) cows. The increased in milk production and reduction of reproductive interval in cross-bred cattle were stated by Hendratno, 1999 and Miah et al. 2000 in the same management condition. These results indicate that UMB supplementation for straw based diets fed to cross-bred cattle have a positive effect in both milk production and reproductive parameters. The reduction of calving interval has an economic value for dairy farmers as more lactations per cow are a possibility..

Table 1: Effect of UMB supplementation on production and reproductive performance of cross-bred cattle

Parameters	Holstein cross		Sahiwal cross		s.e.m
	control	umb	control	umb	
Milk yield (kg/d)	5.61 ^{ad}	6.38 ^a	3.95 ^c	4.72 ^{dc}	0.08
Calving to (d) 1st P4 rise	93	82	119	80	3.98
Calving to 1st estrus (d)	162	123	151	112	4.51
Calving to conception (d)	233 ^a	170 ^{bc}	209 ^{ab}	143 ^c	5.16
Calving interval (d)	516 ^a	453 ^{bc}	492 ^{ab}	425 ^c	5.12

Means with different superscripts in the same row differ significantly (p<0.05)

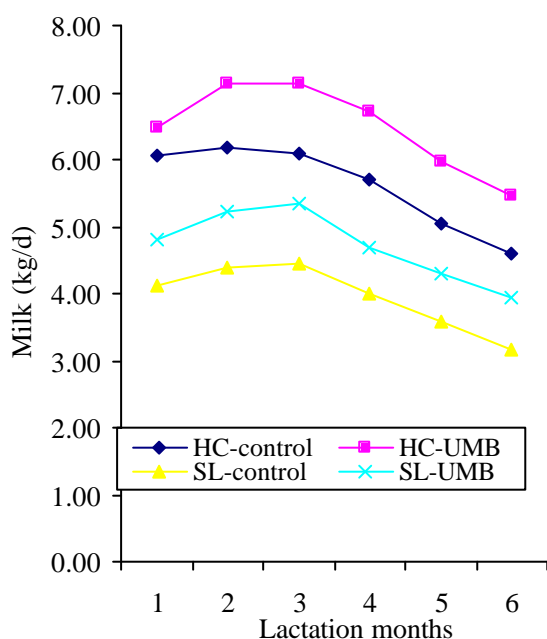


Figure 1 Milk yield of UMB supplemented and non-supplemented cows

Conclusions Urea molasses blocks may be used as feed supplements to improve milk yield and reproductive efficiency of cross-bred dairy cattle offered straw based diets in Bangladesh.

References

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