Short Communication

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Improving productive performance of crossbred cattle in cold arid conditions of Kargil through UMMB supplementation

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Locally available feed resources are nutritionally rich, but shortage becomes the major constraint, especially (Malik *et al.* 2011) during winter in Kargil, a cold arid district in Ladakh province, wherein temperature varies between –38°C and +39°C (APR 2007), hence, nutritional requirements are not fulfilled (Mondal and Mir 2008). Use of urea molasses mineral blocks (UMMB) for fulfilling the nutrient requirement of livestock fed on crop residues based diet may be an alternative (Wadhwa and Bakshi 2010, Fulsounder *et al*. 2011, Kayastha*et al*. 2012). UMMB could replace 30 to 40% concentrate allowance without any loss of animal production (Garg and Sherasia 2010, Tyagi *et al.* 2013). Till date no attempt has been made to evaluate the response of UMMB supplementation in lactating cows under cold-arid Kargil region. Therefore, the study was undertaken to study the response of UMMB supplementation on milk yield and cost of production in crossbred cows under cold arid condition of Kargil.

Trial was conducted from July to September 2012 under small holder management conditions to ascertain the effect of urea molasses mineral block (UMMB) supplementation on milk production in crossbred cattle. Farmers (13) having crossbred cows (Jersey × local) in early to mid lactation were selected for the on-farm feeding trial. The average body weight of selected cows was 350 kg with average daily milk yield of 5 kg/cow/day. Body weight of animals was determined as per Sastry *et al*. (1988). Based on the local feeding practices, body weight, milk yield, stage of lactation and parity; the animals were divided into 2 equal groups (10 cows/group) as control and UMMB fed group. Animals under the control group were fed in conventional way as per the farmer practice while in treatment group, animals were supplemented with UMMB licks *ad lib*. The consumption of UMMB was monitored weekly by weighing the blocks regularly. All the animals were trained to lick the blocks within an adaptation period of 2 weeks. Animals were allowed to graze for 5–6 h daily and offered dry and green forages with homemade concentrate @ 1–3 kg/ animal/day. The mixed forages consisted of grasses, barley straw and wheat straw. Green fodder mainly lucerne was offered to animals. Animals of treatment group were fed UMMB based ration with 25% less concentrate as compared to control group. Daily recording for green fodder, dry fodder, concentrate and block consumed and milk yielded was done by the farmers on a pre-designed data sheets.

Data were subjected to analysis of variance in a completely randomized design and the significance of the differences between treatment means was determined using the student t-test according to Snedecor and Cochran (1989). Cost-benefit ratio (CBR) was calculated to assess the economical profitability of UMMB supplementation and the partial budget analysis was done to estimate the likely economic impact of supplementation technology (Stemmer *et al.* 1998, Peso 2002).

Chemical composition of the feeds and fodders: The major components of the concentrate mixture were wheat and barley flour. Ingredients used in the formulation of homemade concentrate mixture were adequate in all the nutrients as reported earlier by Mondal and Mir (2008).

Dry matter intake: UMMB supplementation significantly ($P<0.05$) improved intake from dry fodder (Table 1). Nonsignificant reduction in green fodder and concentrate intakes occurred in animals of UMMB fed group. The daily average intake of UMMB was 326 g ranging from 275–375 g. The variation in intake might be attributed to the variability in lactation stage, parity, age and basal feeds provided by the different farmers. Some animals did not lick the UMMB initially, due to palatability problems or access to sufficient green forages. Feeding of UMMB to the crossbred cattle lead a significant ($P<0.05$) increase in the dry matter intake ($kgday^{-1}$ and gkg^{-1} $W^{0.75}$) from basal diet. Improvement in the basal diet due to UMMB supplementation has been well established and may vary widely depending on quality of basal feed and feeding

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system (Singh and Singh 2003).

Most of the animals in on-farm trial had fairly good body condition scores ranging from 2.3 to 3.1. Significantly higher body weight gain (P<0.05) and body condition score (P<0.05) were recorded in animals supplemented with UMMB than for un-supplemented animals. Feeding of UMMB to the crossbred cattle sufficiently meet the nutrient requirement of animals for both maintenance and productive purposes. However, animals under control group were unable to meet the protein requirement due to nutrient deficit.

The cows supplemented with UMMB produced 30% more milk (P<0.05) than the control group (Table 2). These results confirmed the earlier reports represented that an extra yield of 0.5–1.5 kg milk and/or saving of 20–30% concentrate with a reduction of feed wastage of 20–30% (Sahoo *et al.* 2009). Improvement in milk yield on UMMB supplementation may be attributed to balanced energy: protein ratio (in present study what was the ratio ?) that resulted from improved rumen efficiency with optimum concentrations of ammonia in the rumen (Fulsounder *et al.* 2011, Malik *et at.* 2011). Quick response to UMMB supplementation was obtained when animals were fed on rice straw.

Economics of UMMB supplementation: The cost of UMMB, concentrates and dry roughages were considered for the calculation of economics of supplementation. Cost of other variables. viz grazing, green fodder and labourwas the same for both the groups. Procurement price of UMMB was ₹ 22.50/block of 1 kg. Selling price of milk by the farmer during the experimental period was ₹ 30/litre.

Feeding of UMMB improved marginal rate of return by 59.9% with a cost: benefit ratio of 5.99, which appears to be very lucrative over the traditional feeding system (Table 2). The net benefit due to supplementation with UMMB on per animals basis was ₹ 41.1/day over the traditional feeding. High returns are required from any farm innovations to offset the risks associated with its adoption.

Table 1. Effect of UMMB supplementation on feed intake and performance of lactating cows

Observations	Control	UMMB
Dry matter intake (kg/day)		
Green fodder	1.52±0.3	1.47±0.4
Dry fodder	5.49±0.8[a]	6.57±0.7[b]
Concentrate	2.27±0.5[a]	1.73±0.4[b]
UMMB	–	0.3±0.05
Total DM intake (kg/day)	9.28±0.85[a]	10.07±1.0[b]
Dry matter intake (% live weight)	2.67±0.27	2.84±0.30
DMI (g/kg $W^{0.75}$)	114.71±3.74[a]	124.47±4.81[b]
Crude protein intake (g/day)	768±65[a]	837±75[b]
Digestible crude protein intake (g/day)	384	415
Total digestible nutrients intake (kg/day)	4.42	4.69

Values having[ab] superscripts in a row differ significantly (P<0.05).

Table 2. Effect of UMMB supplementation on average milk yield, composition and economics of feeding

Observations	Control	UMMB
Milk yield (kg/day)	4.61±0.24[a]	5.98±0.35[b]
Composition		
Total solids (%)	12.71±0.34[a]	13.20±0.21[b]
Solids-not-fat (%)	8.26± 0.14	8.39±0.16
Crude protein (%)	3.31±0.04	3.39±0.05
Fat (%)	4.45±0.15[a]	4.81±0.25[b]
Ash (%)	0.80±0.21	0.81±0.32
Average milk yield (lt/cow/day)	4.61±0.24[a]	5.98±0.35[b]

Values having[ab] superscripts in a row differ significantly (P<0.05).

Apart from the increase in milk production, animals showed the symptoms of heat at proper time and conceived at first service due to the supplementation of UMMB. Conversely, in un-supplemented control group, average 1.7 services were needed for successful conception. The improvement in reproductive efficiency on the supplementation may be attributed to enhance normal ovarian cyclicity as also reporterd by Alam *et al.* (2006.

In view of the above, the economic returns may be higher if the positive long-term impact of supplementing UMMB on general body condition and reproduction are also taken into account. Considering the present cost of feed supplement and the market price of milk, UMMB supplementation was found both economical and cost effective.

It may be concluded from the study that urea molasses mineral supplementation (UMMB) to the crop residues based ration may be a good alternate in the Kargil area where feed scarcity prevail around the year. UMMB supplementation increased the intake of nutrients, milk production in crossbred cattle and proved a cost effective method for improving the productivity levels under harsh climatic condition and feed scarcity of Kargil region.

SUMMARY

The study was carried-out to assess the response of urea molasses mineral block (UMMB) supplementation on milk yield and cost effectiveness with lactating crossbred cows, maintained under smallholder mixed farming system at cold arid conditions, Kargil. Crossbred cows (20) in early to mid lactation were selected; 10 cows were given free access to UMMB in addition to normal ration and the other 10 cows served as control. Supplementation of UMMB licks significantly increased feed intake, milk yield and maintained live weight and body condition score of the cows. UMMB improved general health of the animals with enhanced cash benefit of over ₹ 41.1/cow/day. The UMMB supplementation technology was found a cost-effective approach to maximize the utilization of locally available feed resources which are scarce in the region as it remains covered with snow and cutoff from rest of world for 6 months.

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REFERENCES

Alam M G S, Azam S U and Khan J. 2006. Supplementation with urea and molasses and body weight, milk yield and onset of ovarian cyclicity in cows. *Journal of Reproductive Development* **52** (4): 529–35.

APR. 2007. *Annual Progress Report.* Krishi Vigyan Kendra, Sher-e-Kashmir Universityof Agricultural Sciences and Technology, Kashmir, Kargil.

Fulsounder A B, Sorthiya L M, Tyagi K K, Patel M D and Malik P K. 2011. Effect of graded level of molasses supplementation on dry matter intake, body condition score, milk yield and its composition in lactating Surti buffaloes. *Indian Journal of Animal Production and Management*.

Garg M R and Sherasia P L. 2010. Production of urea-molasses-mineral blocks in a process developedby Dairyboard of India. *Success and Failures with Animal Nutrition Practices and Technologies in Developing Countries*. FAO Electronic Conference 1–30 September 2010, pp. 21–24.

Kayastha T B, Dutta S and Roy R K. 2012. Impact of supplementation of UMMB licks in the ration of dairy animals. *Vetscan* **7**: 107–10.

Malik P K, Arvadia M K, Deshpande S B, Fulsounder A B, Tyagi K K and Siddique R A. 2011. Effect of nitrogen and cutting management on production potential and quality parameters of Kanchru (Apludaaristata) fodder. *Indian Journal of Animal Nutrition* **28**(2): 137–143.

Mondal G and Mir M S. 2008. Chemical composition of commonly used feeds and fodders available in Ladakh. *Indian Journal of Animal Sciences* **78**: 328–30.

Ranjhan S K. 1998. *Nutrient Requirements of Livestock and Poultry*. Indian Council of Agricultural Research, New Delhi, India. pp. 3–9.

Sahoo B, Vishwanath C, Bhushan K J and Agarwal A. 2009. Effect of Urea Molasses Mineral Block Supplementation on milk production of cows (*Bos indicus*) in mid Hills of Uttarakhand. *Indian Journal of Animal Nutrition and Feed Technology* **9** (2): 171–78.

Sastry N S R,Thomas C K and Singh R A. 1988. *Farm Management and Poultry Production*. 5th edn. Vikas Publishing House, Delhi, India.

Snedecor G W and Cochran W G. 1989. *Statistical Methods.* 8th edn. Iowa State University Press, Ames, Iowa.

Tyagi K K, Sorathiya L M,Fulsounder A B, Manish D and Malik P K. 2013. Effect of molasses replacer "Sweetos" on DMI, nutrient digestibility, body weight gain and body condition score in Surti buffalo heifers fed on paddy straw based ration. *Indian Journal of Animal Nutrition* **30**(1): 52–55.

Wadhwa M and Bakshi M P S. 2010. Urea-molasses-multinutrient blocks/licks: a blend of nutrientsfor ruminants. *Success and Failures with animal nutrition practices and technologies in developing countries.* FAO Electronic Conference. pp35–40.