

*Original Research***Apricot Fortified-Urea Molasses Mineral Blocks Ushering Feed Supplement for Cross Bred Cattle in the Cold Arid Kargil Region of J&K State****Nuzhat Hassan^{1*}, Mehdi Akhoun¹, Sabiya Asmat¹, Ajaz A Dar¹, Nasreen Katchu¹, Diskit Dolkar¹ and S. R. Ahmad²**

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Abstract

A study was carried out in a village at Kargil taking lactating crossbred cows, maintained under a smallholder mixed farming system to assess the response of wild apricot fortified-urea molasses mineral block (UMMB) supplementation on milk yield and cost effectiveness during the unavailability of adequate fodder. Forty adult crossbred cows were selected, 20 cows were given free access to Apricot-UMMB in addition to their normal ration and the other 20 cows served as control group. It was studied that crossbred cows given apricot-UMMB supplementation showed significant increase in feed intake, milk yield, fertility rate and body weight gain. The health condition of Group I, supplemented with apricot specific UMMB after 5th week proved to be improving than the Group II dairy cattle. A significant increase ($P < 0.01$) in daily milk yield was observed as a result of apricot-UMMB supplementation after 7th week. Further, it was observed that there was improvement in dry hay intake and overall health condition in those dairy cows. Hence, apricot-UMMB supplementation is cost effective method to utilize locally available feed resource for enhanced animal productivity during extreme winter and feed scarcity seasons in cold arid regions of Kargil area.

Key words: Apricot-UMMB, Cold Arid, Kargil, Crossbred Cattle, Milk Yield

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Introduction

The cold arid area of 7.1 million hectare of the country lies in the state of Jammu & Kashmir covering the Leh and Kargil area of Ladakh region. The majority of people in the region live in rural areas and its livelihood is based on crop and livestock production. Livestock production sector plays a vital role in the

livelihood of the majority of people in this area. However, the benefit obtained from the livestock resources is limited mainly because of extreme climatic conditions. There is decrease trend in total bovine population in the state and one of the major reasons is that the state is facing shortage of dry roughages, concentrates and green fodder particularly in semi-arid cold regions. In Kargil, livestock are fed cereal crop residues such as wheat straw, barley, maize and dry grasses as major source of forage for livestock feeding during the dry season. These feeds are deficient in crude protein, minerals and vitamins, overall resulting in poor nutrition, poor growth and lesser productivity. The use of urea molasses mineral blocks (UMMB) for supplementation based on area specific needs of animals and local availability has the potential to increase the viability of livestock production. On the other hand wild apricot locally known as *Chulli* is a potential stone fruit of the Ladakh region (Parmar and Sharma 1992; Sharma, 2003). The fruits are said to possess many nutritional and medicinal properties (Kapoor *et al.*, 1987). The total sugars content in wild apricot fruit is 6.30 percent and 9.95 mg per 100 g of pulp is the vitamin C contents (Parmar and Sharma, 1992). The press cake, left after oil extraction is considered unfit for human consumption and as cattle feed due to presence of hydro-cyanic acid, however the apricot cake from which the essential oil has been removed is free of hydro-cyanic acid and can be used as feed stuff for livestock (Sharma *et al.*, 2010). The objective of the present study was to assess the response of local availability of wild apricot fortified UMMB supplementation on milk yield, growth condition and determine the cost effectiveness of the supplement in crossbred cows maintained under small holders management conditions.

Materials and Methods

Study Area

The study was conducted under small farm holders management conditions during summer months (March to July 2018) in cold arid region of Kargil in Ladakh (J&K). The area was selected owing to suitability of climate and altitudinal location as per programme of KVK-Kargil.

Animal Feeding and Management

Based on the willingness to participate, 40 farmers with at least one dairy cow were selected for the study (n=40). Average body weight of the selected cows was approximately 230 kg with an average daily milk yield of 3 kg/cow. The animals were divided into two equal groups (n=20 cows/group). One group was supplemented with apricot specific UMMB with normal feeding and control group with no supplementation. Groups were evaluated for body weight gain, milk yield and health status. All the selected animals were fed dry and green forage together with a quantitative amount of home-made concentrate varying from 1.0 to 1.5 kg/animal per day. During the first 3-4 days about 200 g of block licking was

provided then after few days about 400 g was given to restrict intake during the adaptation period. Thereafter, blocks were offered *ad libitum*.

Apricot -Specific Urea Molasses Mineral Block (Apricot Sp-UMMB)

Apricot specific UMMB was prepared at KVK-Kargil, Ladakh using dried apricot pulp and crushed apricot oil cake, urea, molasses and mineral along with cereal bran that included rice bran and barley bran (Table 1). Dried apricot pulp and apricot oil cake were boiled to make a paste and to remove any toxic substance. Apricot pulp also has the binding property, therefore there was no need to add cement or quick lime as binding agents. All the ingredients were mixed in a proportion based on nutrient status of ingredients so as to meet requirements of the adult dairy cow. The blocks were manually prepared by the workers.

Table 1: The percentage of ingredients used for Apricot sp-UMMB is as under:

S. No.	Ingredients	Percentage
1.	Apricot pulp	16.5
2.	Apricot oil cake	7.5
3.	Molasses	40
4.	Barley bran	15.5
5.	Rice bran	12.5
6.	Urea	5
7.	Salt	1
8.	Mineral mixture	1

Each block weighed about 1.5 kg (Fig.1&2). The blocks were air dried for 20 days and then fed to the animals. All the animals got used to licking the blocks within an adaptation period of few days.



Fig. 1&2: Apricot-fortified UMM' blocks

Production Parameters

Dairy cows were monitored for the intake of feed and UMMB, milk production, productivity and general health and data was recorded over a period of 20 weeks after an adaptation stage. The body weight of the

cows was estimated at the beginning and end of the feeding trial indirectly. Farmers were advised to record the intake of concentrate, green and dry fodder, apricot-UMMB and milk production.

Results and Discussion

The health condition of Group-I supplemented with apricot specific UMMB after 5th week proved to be improving ($p < 0.05$) than the Group-II dairy cattle (Table 2). Animals that were not supplemented with the UMMB were more susceptible to disease conditions like diarrhea, respiratory infections, infertility and mastitis.

Table 2: Effect on body weight with UMMB supplementation on feed intake and performance of lactating cow

	3 rd week	5 th week	7 th week	10 th week	12 th week	15 th week	18 th week	20 th week
Group-I	+	+	++	++	+++	+++	+++	+++
Group-II	+	+	+	+	-	-	-	+

Also the fertility rate of the Group-I cattle improved significantly than Group-II from 7th week onwards. A significant increase ($P < 0.01$) in daily milk yield was observed as a result of apricot specific UMMB supplementation. Group-I dairy cattle supplemented with Apricot-UMMB on 7th, 12th, 15th and 20th week had an increase of one to half liter in milk yield than the non-supplemented group-II dairy cattle (Table 3).

Table 3: Effect on milk yield with UMMB supplementation on feed intake and performance of lactating cows

Group	Milk Yield						
	(3 rd week)	7 th week	10 th week	12 th week	15 th week	16 th week	20 th week
Group-I	2.14±0.73	3.55±0.83	3.65±0.81	3.90±0.64	3.85±1.04	4.05±0.83	4.20±0.77
Group-II	2.05±0.80	3.20±0.89	2.30±0.57	2.60±0.75	2.70±0.92	3.05±1.05	3.21±1.07

Higher feed intake was noticed in supplemented Group-I on 7th, 12th, 15th and 20th week than the non-supplemented Group-II. Group II showed non-significant difference. There was gain in body weight in Group-I dairy cattle on 12th, 15th and 20th week than the early weeks.

Table 4: Effect (in percentage) on various production parameters with apricot-UMMB supplementation in dairy cattle

S No.	Production Parameters	Percentage
1	Improved milk yield	96
2	Improved body condition	85
3	Improved reproductive status	72
4	Improved the health status	78
5	Any urea poisoning	0
6	Ready to produce apricot-UMMB by their own	70

There was no significant increase in body weight gain in Group-II dairy cattle. No case of any urea poisoning was reported in the Group-I and more than seventy percent of the dairy cow owners were ready to formulate apricot-UMMB by their own as it was cost effective (Table 4).

Shortage of feeds and fodders, in terms of both quantity and quality, is a major problem for developing countries like India in meeting the nutritional requirement of livestock. The unpredictable severe climates also adversely affect agronomy and livestock. There is need of strategic scientific feeding and health management of livestock with a need of alternate feed resources to meet the feed requirement in semi-arid cold areas. As, such regions are prone to mineral deficiencies in livestock therefore supplementation of mineral mixtures also essential for proper utilization of feeds. Urea molasses feed blocks are either made to test their efficacy with a target group of ruminants or to provide continuing nutritional support for them. Results suggested that 30 to 40 % concentrate allowance could be reduced by feeding UMMB without any loss of animal production (Garg *et al.*, 1998). Several workers have shown increased intake or digestibility, or both, normal feed when the feed is supplemented with urea, molasses and minerals (McLennan, Wright and Blight, 1981; Deniel and Nath, 1986).

Spraying of these additives on the straw is not a viable option due to the risk of urea toxicity and problems of distribution, handling and storage of molasses under field conditions. Various treatments – physical, chemical, physiochemical and biological – have also been tried to improve intake and utilization of nutrients from poor quality roughages. Improper use may cause severe economic loss, especially in the case of urea. An excessive amount of urea or faulty treatment of roughages treated with it may harm, or even kill, animals due to ammonia toxicity. The problem of feeding urea to animals has been overcome in India by the introduction of feed supplementation blocks in the form of urea-molasses mineral block (UMMB) licks developed at the National Dairy Development Board (NDDB), Anand, India (Kunju, 1986). Several researchers had previously reported on the use of UMMB licks for supplementing crop residue-based diets for large and small ruminants (Sansoucy, 1986). When supplementation in the form of UMMB lick was provided, the ammonia-N (NH₃-N) in the rumen fluid increased to optimum (Manget Ram and Kunju, 1986; Kunju, 1988; Manget Ram, 1989; Mohini, 1991). In a trial by Wang *et al.* (1995), dairy cows (n = 10) supplemented with multinutrient blocks produced 1.1–1.5 kg (5.3–5.9 percent) more milk than those without blocks (n = 10), and less metabolic disorders were observed in the supplemented animals.

Many farmers reported improvement in the general health of animals on supplementation with block licks compared with feeding straw alone. The use of locally available apricots and its by-products is cost effective and alternative source nutritious supplement for livestock. The left over apricot press cake is also high in proteins, vitamins, minerals and can be utilized in feeds (Singh 1951; Sharma *et al.*, 2010). Increased straw intake was reported by all farmers, with simultaneous improvement in milk yield and fat percentages (Dave and Choudhary, 1986). UMMB feeding stimulates rumen fermentation, thereby, increases feed intake by

animals, increases microbial protein synthesis and supply at abomasum level, giving higher productivity. Earlier studies by other workers in India (Makkar and Saijpaal, 1996) also reported 6–8 percent increase in milk production in cows consuming 400–500 g UMMB daily. Improves daily milk (0.5–1.0 kg) and fat (0.3–0.5 percent) yields and increased lactation length. It was observed in field trials that the animals licked the blocks in sizable quantities, depending on the composition of their basal diet. In general, each 3-kg block lasted for one week per animal. Supplemented buffaloes sustained peak milk yield for longer (4 vs 2 weeks) than their unsupplemented counterparts (Randhawa *et al.*, 2002). This could replace up to 20 percent of the concentrate in the diet without affecting the quality and quantity of milk produced and body weight in buffaloes fed with 30–35 kg green fodder (Chauhan *et al.*, 1997).

Conclusion

Use of locally available apricot in UMB's can provide an alternative, cost effective and definite utilization for the optimum yield and performance in dairy cattle especially during the unavailability of adequate fodder. This supplementation overall improved the health status, body weight gain, increased milk yield, and decreased susceptible to disease conditions like diarrhea, respiratory infections, infertility and mastitis in dairy cattle. Therefore, in Ladakh region, the apricot specific UMM Blocks can be considered as alternative feed supplements for livestock.

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