

Impact of Supplementation of UMMB Licks in the Ration of Dairy Animals

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India is the highest milk producing country in the world and by the end of 2022, India aims at producing 172 MMT milk at an annual growth rate of 4%. This is attributed to large livestock population rather than the productivity. Average livestock productivity in India is quite low due to poor genetic potential, nutrition and management of animal. Nutrition plays pivotal role in exploiting the genetic potential of dairy animal. But in India the biomass resources are very limited and there is shortage of feed and fodder. The available feed resources would need to be utilized judiciously with value addition. Introduction of UMMB lick technology is one of the method developed in recent year to combat the nutritional status of dairy animals. NDBB has developed UMMB manufacturing technology, provided to dairy cooperatives, private organizations and internal agencies. UMMB licks are also manufactured in different states under the co-operative sector. The UMMB lick allows the slow ingestion of urea which in turn is efficiently utilized by the rumen microbes. Several experiments concludes that supplementation of UMMB licks significantly increased feed intake, milk yield, maintained body weight and body conditions score of the cows. Hence in the present article the utility of UMMB supplementation technology, its cost-effective approach to maximizing utilization of locally available feed resources and performance of dairy animals will be discussed.

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INTRODUCTION

Feeding plays vital role in exploiting the genetic potential of dairy animals. It consists of more than 70% of total cost of milk production. Hence it is considered as a critical parameter in the overall success of dairy development program. Indian cattle industry is an integral part of Indian agriculture. Presently India is bestowed with a huge livestock population comprising 222 million cattle, 98 million buffaloes, 124 million goats, 61 million sheep and 489 million poultry. Animal Husbandry, Dairy and Fisheries generate supplementary incomes and gainful employment for rural households, particularly among landless, marginal or small farmers, as well as women. The products obtain from these sectors are also a source of valuable nutrients to millions of people of India. More than 70 million rural families are engaged in milk production in India. Landless, small and marginal farmers with limited resources account for 65% of the total milk production in the country. Dairy cattle production is mostly based on crop residues such as wheat straws, paddy straws, maize stalk; natural herbage like grass, tree leaves etc.; agro-industrial byproducts; very little green fodder include cultivated legumes and non-legumes, pastures, sugarcane tops etc. and concentrates include grains, oil cakes/meals, brans, chunnies etc. Such feeding practice does not provide adequate nutrients to the animals for improving their growth and production potential. In general low quality crop residues are deficient in fermentable nitrogen,

carbohydrate and important minerals. Thus the conventional method of feeding dairy animals solely on wheat straw and small amount of poor grade concentrate is not satisfactory. For supplementing as well as value addition of such poor quality feed resources of ruminants animals, the use of urea-molasses mineral block (UMMB) lick has been recommended by many nutritionists. The main aim is to improve the nutritive value of the traditional straw-based diet and thereby promoting healthy growth and milk productivity of dairy animals. Further ruminants have the unique ability to convert NPN compounds (urea) in presence of readily available source of energy (molasses) to microbial protein of high biological value. Considering these facts urea molasses mineral block (UMMB) were developed to supplement the diet of ruminants based on poor quality roughages by several researchers. In India this technology was introduced in the cooperative dairy sector in 1984, still its use in field condition is very limited. Therefore the present study focus on methodology of preparing UMMB as well as impact of UMMB lick technology on the performance of milch animal.

THE COMPOSITION OF UMMB AND METHODS OF PREPARATION

The primary objective of the UMMB lick is to provide supplementary nutrition to the dairy animals kept in village mainly on straw and crop residue. These are the lick blocks containing urea, molasses, vitamins, minerals and other multinutrients. The ingredients are designed to provide a wide range of nutrients to cover all potential deficiencies. A standard UMMB consists of molasses (30-50%), urea (5-10%), a cereal bran such as rice, wheat or maize bran (15-25%), and oil seed cake such as cotton seed cake, ground nut cake (10-20%), salt (5-7%), lime or cement (5-10%), bone meal (5-7%) and minerals (1-2%). Urea is only source of nitrogen (46%) which readily hydrolysed in the rumen producing ammonia. So readily available source of energy such as molasses (cheap source must be given in urea supplemented feed so that the rate of hydrolysis of ammonia from urea and release of

energy from the molasses remain constant and also facilitate for slow release of ammonia from urea in the rumen). As a result the rumen microbes can easily form the microbial protein for the host animal without causing ammonia toxicity. Such multinutrient block not only provides overall nutrient requirement of ruminant animal but also these are more convenient for packaging, storing and transportation.

The UMMB can be prepared by two process namely Hot process and Cold process. In hot process, the weighed quantity of urea molasses are mixed together in an iron pan and heated for about half an hour while being stirred slowly. Still hot, other feed ingredients are added and mixed thoroughly. Blocks are prepared by using a hydraulic press. This method is labour intensive, time consuming and very expensive. The cold process of manufacturing UMMB involves firstly proper weighing, grinding and mixing of ingredients, followed by molding and drying to produce final UMMB licks. The cold process has the merits of saving time, energy, labour and is less expensive. So, the farmers can use make of cold process in manufacturing UMMB licks at their own level. However the consistencies of the molasses play an important role in the successful manufacture of UMMB which depend upon the quantity of sugar in the molasses. This sugar quantity, expressed as a percentage of total weight in the molasses is called the BRIX value. To ensure good hardening the BRIX value should be 80 or more that can be checked with a small pocket refractometer.

PERFORMANCE OF ANIMAL IN FEEDING UMMB LICKS

Various studies had been conducted in India and abroad to assess the optimum level of feeding of UMMB for cross bred cattle for optimum performance of animal. Increased milk yield 1 to 1.5 kg/day, better reproductive performance and lower inter-calving period was reported on feeding UMMB @ 500 g/head/day with Rice straw (1.4kg/head/day) and concentrate (2.25kg) Wang et al (1995), Chen et al (1993). The post-

partum reproductive intervals of cow was lower in the animals supplemented with UMMB on rice straw based (Hendratno 1999, Mazed 1997), which is of economic significance. When buffalo heifers fed on rice straw diets were supplemented with UMMB, daily weight gain was 650 g. versus 620 g. for control animals (Lu et al., 1995).

Supplementation of UMMB in the ration of ruminant animal improves the digestion and utilization of nutrients as reported by various investigators. UMMB lick is effective in increasing nutrient digestibility of low quality roughages through improved ruminal fiber digestion (Wu and Liu 1996, Zhang et al (1997) studied the effect of supplementary urea containing lick blocks on NH₃- N concentration and pH value in the rumen of wethers. The pH did not alter, while rumen NH₃-N ($P < 0.01$) concentration significantly increased and approached or exceeded 13 mg/100 ml rumen fluid, the optimal level of NH₃-N for rumen microbial activity suggested by Hume, Moir and Somers (1970). The improvement in the rumen ecosystem is beneficial to rumen microbial activity, and hence rumen digestion. Xue et al., (1995) observed that when the animals were supplied with an additional urea block of 50 g per head per day, the microbial protein yield was increased (11.87 vs 10.18 g/day) and synthetic efficiency was improved compared to that of control. Further ,it has also been reported that when rice straw, maize stover and sugar cane bagasse were incubated in the rumen of buffaloes supplemented with UMMB, the 48- hour degradation of feedstuff nutrients was significantly higher than in the rumens of animals without block supplementation (Guan et al., 2001c).

PROSPECTS AND ADVANTAGES OF UMMB LICK TECHNOLOGY

From the various studies it was observed that UMMB lick technology has a great role to play in the efficient utilization of agro-industrial by-products and in meeting the nutritional needs of animals to exploit better performance in their

productive life. Further value addition like addition of anthelmintics or some other drugs will enhance the adoption of this technology among the farmers. The incorporation of Fenbendazole in UMMB led to 13 percent increase in milk production in buffaloes (Knox, 1995; Sanyal and Singh, 1995). Preliminary trials on medicated blocks carrying Replanta, a herbal drug, hastened uterine involution and postpartum ovarian activity. Thus, supplementation of UMMB lick in the ration of dairy animals helps in overcoming the malnutrition/under nutrition, increase production at farm level and generate better returns for a dairy farmer with the following advantages:

1. The various feed ingredients being used in the formation of UMMB are easily available in the market.
2. The method of its preparation is very easy. Farmers can make UMMB for themselves as well as can sell them in the market.
3. UMMB can be stored for a long time under dry conditions. Similarly, it can be transported to long distance without difficulty.
4. UMMB are more suitable for supplementing dry fodder based diets for sustainability of ruminants especially during droughts and floods.
5. Licks are hard enough to control gradual intake by the animal.
6. UMMB is comparatively cheaper source of energy, protein and minerals than the conventional source of proteins like mustard or cotton oil cakes and concentrated.

CONCLUSION

From the above discussion it can be inferred that due to the unique ability of the ruminants to synthesize microbial protein of high biological value from the cheaper NPN source like Urea in presence of readily available energy source like Molasses, it is well established fact that UMMB lick technology is best suited to provide additional nutrition to the animal raised on straw based diet.

It becomes very much essential to introduce this technology to a greater number of livestock owners through extension programme. However one should obey the following precautions before going to introduce UMMB lick to their animals.

1. An UMMB cannot be used as a supplement for animals younger than 6 months, or by animals which have not eaten anything for the whole day.
2. UMMB should not have more than 10% moisture.
3. UMMB should be stored at a dry place and must be protected from rainwater so that it does not soften.
4. UMMB should be offered to the animal in the dry manger.
5. Consumption of too much UMMB must be prevented
6. Animals must always be provided with clean drinking water

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