Urea Molasses Multi-Nutrient Block: A Promising Supplement Feed for Improving Growth and Productivity of Livestock

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Introduction

Animal husbandry plays an important role in livelihood security and economic sustenance of farmers, especially in rainfed areas. As per 20th Livestock Census of 2019, the total livestock population in India was 535.78 million in country showing an increase of 4.6% over previous censes GOI, DAHD 2019. The increasing population and diversified food and fodder requirement of the country is expanding at faster rate, enhancing food production for future years is very challenging. Present availability of green fodder is 462 million tonnes and dry fodder is 394 million tonnes and contribution of crop residue, cultivated fodder and grasslands is 54, 28 and 18% respectively. Currently, India is deficit by 35.6% in green fodder and 10.95% in dry fodder and 44% concentrate feed. The fodder production in the country is not sufficient to meet the requirements; also, the forages offered are mostly of poor quality. Dairy animals are an important source of regular income in rain fed agro-eco-system of India. The productivity of dairy animals is greatly constrained by the lack of green fodder and good quality feed during a prolonged dry season. Reduction in milk production and weight losses of animals during the dry season are common features, which culminate in substantial economic losses to the farmers. Feeding balanced ration plays a crucial role in livestock development programme. In order to exploit the genetic potential of animals it is pre-requisite to ensure adequate and balanced supply of nutrients. Crop residues and dry grasses are the major forages used for feeding livestock in India. These crop residues are low in nitrogen, minerals, vitamins and high in fiber and lignin which restrict intake and digestibility in animals. As a result, performance of animal is often sub-optimal that is reflected in stunted growth, delayed maturity, longer inter-calving period and poor milk yield. In this scenario, strategic supplementation of nutrients is essential to improve the utilization of poor-quality roughages. Dietary supplementation of critical nutrients can improve the utilization of poor quality roughages. Considering the availability and price of concentrate mixture, resource poor farmers can hardly afford them. Animal nutritionists, all over the world, have proved that the nutritive value of crop residues can be enhanced if supplemented with deficient nutrients. The use of urea molasses mineral blocks (UMMB) through licking provides fermentable nitrogen, energy and minerals intermittently, necessary for optimum microbial growth. Microbial protein can contribute 30-40 percent of crude protein requirement of an animal. The use of (UMMB) for supplementing crop-residue-based diets for livestock has the potential to increase livestock production and net daily income. Urea molasses mineral blocks (UMMB) can be fed throughout the year but are more beneficially utilized during the dry season or when the animals are grazing

low quality fodder. Molasses based liquid supplements with added N, minerals and vitamins have recently been shown as another approach for increasing nutrient utilization to enhance growth rate and reproductive performance in cattle. Further, liquid supplements are also having advantages of supplying nutrients with fixed quantity, better availability and are easy to transport.

Why Supplement with Urea Molasses Blocks?

- UMMB can be an important source of supplement for ruminant animals to increase feed intake and productivity. This supplemental feed resource is rich in nutrients like carbohydrates, proteins and minerals.
- Ruminants in India are based on fibrous feeds like mature grass and crop residues. These feeds are deficient in protein, minerals and vitamins and are poorly digestible. Both these characteristics keep intake and productivity low.
- Supplementation with Urea Molasses Blocks (UMB) can increase digestibility of fibrous feeds by up to 20%, increase the nutrients the animal receives and can increase feed intake by 25 to 30%. If another good quality protein source such as cottonseed cake is added to the block, the animal will grow faster. Animals also benefit if other feed stuffs such as vitamins, minerals, medicines, etc., are added to the block.
- Blocks are a convenient way to make and store molasses and urea and also feed to animals. They can easily be made and used in villages. A person may make and sell blocks to farmers as a source of income.
- Several formulations are available for the production of UMMB, which allows responding to different prices and availability of potential ingredients.

How to Make Urea Molasses Mineral Block (UMMB)

- Urea Molasses Mineral Block (UMMB) is made from different ingredients where each has its own contribution in the mixture.
- It is usually made up of molasses, urea, minerals, rice bran, wheat bran, protein rich by-products, salt and water which are mixed and processed to the form a block by moulding.
- Molasses provides energy and minerals like sulphur. It increases its intake by the animal.
- Urea is a non-protein nitrogen source which is essential to improve the digestibility of the feed by providing fermentable nitrogen.
- Cereal bran is the most common fibrous feed used and provides energy and helps hold the block together. Oilseed cake is added to supply protein and it is a bypass protein source and provides immediate function for the animal.
- Salt is added to supply minerals and to control the rate of consumption.
- Cement is used to make the block. It makes the block hard and provides calcium.

Procedures for Production of Urea Multi-NutrientBlock

Urea Molasses Multi-Nutrient Block can be manufactured on the farm. UMMB manufacture is easy and simple and can be afforded by small-holder farmers and commercial producers. Different methods exist which may be used according to local conditions.

The manufacturing of UMMB can be divided into four stages as follows:

- Preparation of the Ingredients.
- Weighing and Mixing of Ingredients.
- Casting and Moulding.
- Drying.

Preparation of the Ingredients

The quantity of the different ingredients is needed to make the UMMB depends on the size of the block to be prepared and the formula to be used. UMMB with different weight and size can be prepared (1 kg, 5 kg, 10 kg and 20 kg etc). The weight of the block to be made determines the amount of each ingredient to be mixed. Using the following standard proportion, UMMB can be produced by thoroughly mixing the accurate quantities of the components viz;, molasses 40%, Rice bran 20%, wheat bran 10%, Urea 10%, cementing agent (Calcite powder) 5%, Lime 5%, mineral mixture 8%, salt 2% etc.

Casting and Moulding

- Once all the ingredients are thoroughly mixed and homogenous mixture formed, place the mixture into moulds.
- Any container, such as tin cans or small buckets can be used as a mould.
- Plastic sheets are used to line the moulds, which make easy to remove the blocks from the mould. The size of the mould to be used depends on the size of UMMB to be manufactured.
- For example to manufacture 5 kg of UMMB we can use rectangular wooden frame of 20 X 20 X 30 cm Length Width & Depth respectively. Compaction will be applied using a wooden bar and left for solidifying for 24 hours.

Drying

The block will be removed from the mold after 24 hours. The UMMB will be left to dry in a well-ventilated room under a shade for about 5-10 days depending upon the weather condition, after which it will be ready for feeding (Licking) by animals.

Characteristics of a Good Urea Molasses Multi-Nutrient Block

- A block is considered to be good when it fulfills the following characteristics are:
- Ingredients are well distributed throughout the block. It does not have lumps of urea.
- It is hard enough not to be squashed between our fingers and should be broken into pieces when it is through to ground. Our hands should feel the sticky appearance of molasses when we hold the block. It should smell a pleasant or sugary smell.

Advantages of the UMMB Technology

- Ingredients are easily available in almost all parts of the country. Methods of preparation are very easy and convenient. UMMB prepared by recommended standards has longer shelf life on storage at a dry place.
- Density of UMMB is much higher than the ingredients, which facilitates long distance transportation at a lower cost.
- UMMB blocks are suitable for supplementing dry fodder-based diets for sustainability of ruminants during lean period.
- UMMB is much cheaper than other conventional source of proteins such as oilseed cakes.

Precautions While Feeding Urea Molasses Mineral Block (UMMB)

- UMMB should be avoided for younger animals (< 6 months).
- UMMB should not be fed to animals which have not eaten fodder throughout a day.

- Consumption of excess quantity of UMMB should be prevented.
- Animals should have always been provided with clean drinking water.
- UMMB must be protected from rainwater so that it does not soften.
- UMMB should only be fed to ruminants (buffalo, cattle, goats and sheep) and never feed to monogastric species like (chicken, donkeys, horses, pigs, rabbits).
- UMMB should not be fed alone; a minimum quantity of roughage is needed to ensure that the animals do not consume excess urea, possibly leads to urea poisoning.
- UMMB should not have higher moisture (Not more than 10 %).
- UMMB should be stored at a dry place protected from insects, pest and rodents.
- UMMB should be offered to the animal in the dry manger etc.

Future prospective and Development

Although various research trial has conducted on UMMB and it has a long history, considerable additional research is still needed in order to fully exploit the benefits of incorporating various nutrients, minerals, additives and drugs in the UMMB. Formulation of blocks based on low cost and locally available feed resources that do not compete with human food should be one of the thrust areas for future work. Some regions are deficient in specific minerals. These regions should be properly mapped and blocks tailored to meet the requirements for specific minerals.

Conclusion

Urea Molasses Mineral Blocks can be an important source of supplement nutrition for sheep and goats to increase intake and increase productivity. It may be concluded that the nutritive value of crop residues which are deficient in nutrients can be enhanced by supplementation of urea, molasses and mineral block. UMMB provides easily fermentable nitrogen, energy and minerals necessary for optimum microbial growth which in turn provides host animal crude protein. Thus, supplementation of UMMB in the ration is quite beneficial. Apart from all positive responses this supplementation improves economic status of livestock owner by giving more economic returns through increased quality milk production.

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