Role and Importance of UMB in Livestock Production

All ruminants (e.g., cattle, buffaloes, goats, sheep, and *yak*) have the unique ability to digest fibrous materials by virtue of the microbial action in the rumen. These rumen microbes also convert dietary non-protein nitrogen released from urea into high quality microbial proteins. To do so, the rumen microbes require a certain amount of food nutrients. Under straw-fed conditions, the fibre digestion activities of rumen microbes remain very slow due to inadequate dietary nutrient content in the straw. In the above situation, the fibrous diets are poorly utilised by animals. In other words, a large portion of potentially valuable feed is excreted in the form of faeces, causing a great loss to the farmers. UMB supplies essential nutrients to rumen microbes and helps maximise the microbial activities for better digestion of fibrous feed and for the synthesis of microbial proteins from non-protein nitrogen.

It is a well-known fact that straw and other fibrous plant residues are the main source of feed for ruminants. The nutritional drawback of the feed is the low level of voluntary intake and the negligible amount of protein content. This is further limited by the animals' poor ability to digest straw due to a high degree of lignification. Nevertheless, cereal straws are the only available animal feed that form the principal diet of ruminants in winter. Thus, animals raised on straw alone do not meet the nutritional requirements and are likely to loose their body nutrition throughout the winter months. This kind of under nutrition in farm animals is likely to prevail in many tropical and subtropical regions where cereal straws form the basic diet of ruminants.

Significant developments could take place for the nutrition of ruminants, if marginal improvements could be achieved in raising the feed value of cereal straw. Several methods for pre-treatment of straw have been advocated in recent years. Chopping straw and soaking it into water before feeding is a laborious practice. Treatment with sodium hydroxide or ammonia gas is routinely carried out only on large commercial farms in many developed countries. Ensilation of paddy/wheat straw with urea solution under anaerobic conditions has become a popular farm practice in many developing countries. In recent years, the Department of Livestock Services, HMG Nepal, has introduced this method of straw treatment on government farms and at field level. The ensilation of straw with urea solution, or the spraying of urea solution on straw before feeding, appears to be simple and, often, has been often reported to result in an increase in animal productivity. But, despite this, it has not been used as an ideal approach under field conditions. Many of the farmers who dug silage pits, in order to treat straw with urea, abandoned them after heating a few batches of straw. Some of the reasons for this are enumerated below.

Effort Needed

Preparation of urea solutions, spraying it on to straw, and ensilation under anaerobic conditions are some of the effort and skill-demanding processes needed and are often laborious tasks for small-scale farmers. They also demand additional effort that interferes with normal farm activities.

Element of Risk

When employing this method there is a high risk of urea toxicity in animals, arising from an uneven distribution of urea. Another problem is the risk of straw spoilage which often occurs when unchopped straws are ensiled without the right anaerobic conditions.

In this context, the urea molasses' blocks have been more widely accepted, partly because the technology is easier to apply. The blocks can be made available to animals all times of the day and night and can be given in troughs or hung within the reach of animals kept in the stall. When the pasture is dry and low in nitrogen content, these blocks can also be taken to the fields so that they are available at all times. The technology is almost free of the problems associated with urea toxicity and is easier to handle as per the prevailing conditions for small-scale farmers. It has also been claimed that a significantly higher digestibility of straw can be achieved by supplementing UMB (15% urea), rather than treating the straw with urea alone (Sudana and Leng 1986). This can be attributed to the fermentable carbohydrate and mineral content in the UMBs.

It has long been realised that the responses to supplementation of urea alone (nitrogen), in terms of the productivity of ruminants fed on straw-based diets, are often limited by other nutrients that are lacking in straw. The digestion of fibre in rumen depends on microbial activities that are directly proportional to the population of these microbes in the rumen. The synthesis of rumen microbes not only requires nitrogen but also energy and minerals, because the microbial bodies are made up of organic compounds. This kind of nutritional deficiency in the rumen of ruminants fed on straw diets can largely be corrected by supplementation of multi-nutrient blocks.

The concept of giving UMB supplementation to ruminants is not only to supply nitrogen but also to provide a wide range of nutrients to make up for the nutritional deficiency in rumen. Application of UMB technology has demonstrated a remarkable impact on ruminant production, particularly in India (Leng 1984b), and its use is now being extended to many countries in Africa.

The potentials of multi-nutrient UMB for upgrading the nutritional status of ruminant livestock raised under poor quality roughage include those listed below.

The administration of:

- essential nutrients such as fermentable carbohydrate and nitrogen,
- macro and trace minerals,
- Vitamins (A, D, B), and
- By-pass carbohydrate, protein, and fats.

In future the prospects of UMB supplementation for livestock production are as given below.

The administration of:

- chemicals to manipulate rumen fermentation; anti-protozoal agents,
- methane inhibitors in the rumen; Rumensine,
- Drugs against flukes, ticks, and the endo parasites, and
- hormones to manipulate growth, lactation, and reproduction.

Thus, the multi-nutrient UMB can be used extensively to solve the diversified problems of livestock production.