



Importance of Bypass Protein in Dairy Cows & Buffaloes

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Protein, an important constituent in ration of cattle and buffalo, all ruminants derive their protein requirement from two sources. One is rumen un-degraded feed protein that gets enzymatically digested in the abomasum and small intestine and another source of protein is rumen microbes. When protein feed given to ruminants, it is degraded by rumen microbes into ammonia, amino acid and peptides. Subsequently, the microorganisms use these degradable products for the process of microbial protein synthesis, though this may not always be an effective method. Additionally, after being absorbed from the rumen wall, the surplus ammonia created by the breakdown of highly degradable protein feed cakes is transported to the liver where it is converted into urea and excreted by urine. It is nothing more than a waste of the animal's energy, which is used in the manufacture of urea, and food proteins. Although microbial protein is a good quality protein, it may not be sufficient to meet the requirement of high milk yielding animals. So, proteins provided to ruminants which are capable of escaping ruminal degradation called un-degraded dietary protein or bypass protein, which are degraded in the intestines and absorbed as amino acids. Thus, to meet the nutritional requirements of high yielding animals, feed technologies like rumen bypass proteins can be adopted as it has consistently shown not only increased milk yield, but also improved growth and reproduction.

Characteristics of Bypass Protein

- High crude protein content.
- Ideal necessary amino acid profile.
- Roughly 70–75 per cent of the protein in an unbreakable form for rumen digestion.
- About 80% of the un-degradable protein in the rumen will be broken down in the small intestine.

Production Process of Bypass Protein Supplement

In India, bypass protein feed is a novel kind of cattle feed that is produced using a unique chemical process created by the National Dairy Development Board (NDDB). A significant portion of processed solvent-extracted protein meals, whole grains, molasses, minerals and vitamins are included in bypass protein feed. The formulation is unique in that it contains more than 70% rumen undegradable protein out of the total amount of protein in the feed. When proteins undergo certain chemical processing, their solubility changes. This has the benefit of shielding high-quality proteins from rumen breakdown. Many substances have been tried to preserve proteins, including ethanol, tannic acid, glutaraldehyde, formaldehyde, acetic acid, and sodium hydroxide. Formaldehyde (HCHO) has been widely employed in the manufacturing of bypass protein feed, out of all the aldehydes recommended. Groundnut cake treated with HCHO inhibits fungus from growing further and so, the cake's mycotoxin generation. It has been discovered that applying heat to feed ingredients increases the

protection of proteins. It functions on the basis of the concept that heat treatment denatures proteins, thereby shielding them against microbial attack. Certain amino acids, such as cysteine and arginine, become less available when heated to higher degrees; hence, steam treatment has been shown to be beneficial in minimising these losses. Both digestibility and bypass ability are increased by steam treatment.

Benefits of Bypass Protein Feed

- An increase in the efficiency of protein utilisation.
- The availability of vital amino acids has increased.
- Enhance the small intestine's availability of limiting amino acids, such as methionine and lysine.
- Enhancement in the milk yield.
- Improvement in fat and solid not fat (SNF) per cent.
- Better growth in young animals.
- It is simpler to satisfy the needs of animals with high yields.
- Improvement in reproduction efficiency.
- Improved ability to withstand illnesses.
- Helps in increasing net daily income.
- Aids in the management of Salmonella and lessens the growth of mould in feedstuffs.

Conclusion

Dairy animals with high yields have higher dietary needs. They may experience negative energy balance in the early stages of lactation if their food intake is less than their milk output. This causes the body's reserves to be utilized, which causes weight loss, a reduction in milk production and the onset of metabolic diseases such as ketosis. Additionally, it delays next conception and calving thus affecting animal fertility. One of the greatest ways to satisfy these needs is to provide bypass proteins. Additionally, bypass proteins support regular fertility. Therefore, for optimum benefits, farmers are suggested to implement the aforementioned feeding practices.