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Popular Article

Processing and preservation of feed and fodder

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Introduction

Utilising feed processing technologies to alter the physical and chemical composition of feed materials and enhance nutrient quality, stability, and hygiene is one strategy the feed industry is looking for to offset rising raw material costs. In the last few decades, feed processing has progressed from straightforward "grind and mix" to more sophisticated thermal procedures that combine mechanical and thermal processing of feed ingredients, like pelleting, expanding, and extrusion. Feed processing alters the feed ingredients' molecular structures and particle sizes, among other physical and chemical changes that may or may not improve the feed ingredients' nutritional value. Pig performance and nutrient digestibility are often improved by thermal processing, which also increases protein denaturation, fibre solubalization, and starch gelatinization and utilisation. The nutritional content of processed feeds is decreased as a result of Maillard reactions, oxidation of lipids, loss of vitamins, and additional feed additives, among other detrimental effects of high temperature and prolonged processing. Therefore, before making official recommendations for processing parameters, feed millers should take into account the relationship between animal nutrition and processing.

Roughage processing methods

Roughage processing increases palatability, digestibility, and nutrient availability but not its nutritional value. Processing techniques such baling, field chopping, and cubing must be used to facilitate handling, save transportation costs, and minimise the amount of storage space needed.

Physical method:

Dry processing methods are

Baling: In the field, the forage is chopped and dried. After that, dried fodder is wrapped or baled

with baler. We can easily and conveniently handle and store fodder using this way.

Chopping/Chaffing: The forages are finely chopped into course or finely chopped pieces. By avoiding selective feeding, chopping minimises the amount of plant material wasted. Cutting increases bulk density, which makes handling easier. Additionally enhances digestion since roughages' comparatively large surface area is exposed for microbial digestion.

Grind: Particle size reduction is the procedure. While fine grinding of roughages reduces the digestibility of crude fibre, which results in a faster rate of feed particles in the gastrointestinal tract, course grinding of roughages increases feed consumption and growth rate. Roughage grinding is not cost-effective.

Pelleting: For a variety of species, pelleted feed has grown incredibly popular in recent decades. Animals are fed pelletized ground roughages. enhances the ingestion of subpar roughages. A whole diet consists of: - Pelletizing roughages with low grade using 30% concentration. Pellets range in size from 12/64" to 48/64" and have a density of 40 lb/cft.

Dehydration is the process of lowering the moisture content in a dehydrator by heating it to between 600 and 15000 F for three to five minutes. High DM and CP are retained in dehydrated fodder.

Cubing: -It can raise roughage density by up to 30 pounds per cubic foot. Water is sprayed on premium hay to raise the moisture content to as much as 14%. Roughage is broken down as opposed to ground, leaving the cube with the fewest possible small particles.

Wet processing methods are

Soaking: Soaking is the process of uniformly mixing concentrates with roughage by mixing or spraying water on it, softening the stems and increasing the roughage's digestibility and feed intake.

Chaffing: When green roughages are chaffed, they can be fed straight away or combined with concentrate mixtures or dry roughages without the need to soak.

Chemical method:

The alkali method is mostly used to handle crop wastes from agro-industrial crops, such as straw. Without significantly altering the cell wall, it weakens the intermolecular hydrogen bonds that hold the cellulose fibre together. Using this procedure, straw is soaked for approximately 24 hours in ten times its weight in 1.5% sodium hydroxide. After that, the liquid is drained out and saved for use in subsequent straw batches.

Lime treatment: The cheapest alkali that may be used to effectively treat coarse roughages is calcium hydroxide, which is produced from lime. This method involves using 1.25% commercial

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lime and soaking straw and agricultural byproducts in the lime solution for many days. The results reveal a 25–30% increase in digestibility.

Biological method:

In recent times, there has been consideration to enhance the nutritional content of roughages by utilizing certain bacterial and fungal cultures instead of chemical treatments. plant residue made up of lignin, hemicellulose, and cellulose. By releasing the necessary enzymes from bacteria, the biological treatment simplifies these substances, making them eventually more readily digestible for ruminants to consume. The rapid growth rate of microorganisms leads to the enrichment of roughages with protein levels.

Enzyme treatment: 25 mg/100 kg of straw is sprayed with a cellulase solution.

Processing of grains include different methods namely dry processing (grinding, cracking, crimping, crumbles, popping, micronizing, roasting, dehulling), wet processing (soaking, reconstitution, steam rolling, steam flaking, exploding, pelleting).

Storage

It's important to store grain, hay, and silage correctly to preserve feed quality, lower fly populations, and safeguard water quality. For grain and silage, leakproof covers are required; for hay, they are preferred. Storage shouldn't be done near ponds or streams of water. Storage buildings must be sturdy and safe.

Silage yields a tasty, nutrient-rich feed source that is harvestable in practically any kind of weather. It works well for recovering crops that have been frozen, damaged by hail, or weedy, and it's a green way to get rid of weeds. The biodiversity of plant life is increased by the range of crops and crop mixes that can be sown in silage fields. In order to stop seepage, handle and store silage carefully. High amounts of nutrients and acids found in silage seepage have the potential to raise the concentrations of iron, nitrate, and ammonia in surface and ground water. Silage seepage can infiltrate groundwater or surface water through runoff.

Hay imported from another farm may contain non-native weed species. These alien species may have an effect on biodiversity and weed management. Consider the accessibility of wildlife and the vicinity of water bodies while choosing a location for hay storage. Leaching nutrients from the feed might impact the quality of the water.

Consider the accessibility of the area to rodents and the proximity to water bodies while selecting a location for grain storage. Both the quality of the grain and the water can be impacted by leaching from the grain. When storing treated seed leftovers on the farm, exercise extra caution.

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