

Popular Article

Feeding Soybean Straw to Cattle and Buffalo: Nutritional Value, Benefits, and Considerations

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Introduction

Soybean straw, also known as soybean stubble or residue, is the plant material left after harvesting soybeans. As global soybean production continues to increase, the availability of this by-product has grown, presenting an opportunity for its use as a feed resource for ruminants, particularly cattle and buffalo. This article explores the nutritional value of soybean straw, its potential benefits, and important considerations for its use in ruminant diets.

Nutritional Composition of Soybean Straw

Soybean straw's nutritional value can vary depending on factors such as variety, growing conditions, and harvesting methods. On average, it contains:

1. Dry Matter: 88-92%
2. Crude Protein: 4-7%
3. Neutral Detergent Fiber (NDF): 65-75%
4. Acid Detergent Fiber (ADF): 45-55%
5. Lignin: 7-10%
6. Ash: 5-8%

The relatively high fiber content and low protein make soybean straw a low

quality roughage. However, its availability and potential for improvement through various treatments make it a valuable feed resource in many regions.

Benefits of Feeding Soybean Straw

- 1. Cost-effective feed source:** In areas with significant soybean production, straw can be an economical alternative to other roughages.
- 2. Drought resilience:** During periods of fodder scarcity, soybean straw can help maintain rumen function and provide a basic energy source.
- 3. Environmental sustainability:** Utilizing crop residues like soybean straw reduces waste and promotes circular agricultural practices.
- 4. Rumen health:** The high fiber content supports rumen function and can help prevent acidosis when combined with more concentrated feeds.

Considerations for Feeding Soybean Straw

- 1. Nutritional limitations:** Due to its low protein and high fiber content, soybean straw should not be the sole feed for cattle or buffalo. It needs to be supplemented with

protein sources and more energy-dense feeds.

2. Palatability: Soybean straw is generally less palatable than other crop residues like wheat or rice straw. Mixing it with more palatable feeds or using feed additives can improve intake.

3. Anti-nutritional factors: Soybean straw may contain anti-nutritional factors like tannins and lignin, which can reduce digestibility and nutrient availability.

4. Physical form: The straw's coarse texture may limit intake. Chopping or grinding can improve consumption and digestibility.

5. Mycotoxin risk: Improper storage can lead to mold growth and mycotoxin production. Proper drying and storage are crucial.

Strategies for Improving Soybean Straw Utilization

1. Physical treatments

Chopping: Reduces particle size, increasing intake and digestibility.

Grinding: Further increases surface area for microbial attack in the rumen.

2. Chemical treatments

Urea treatment: Increases crude protein content and improves digestibility.

Sodium hydroxide treatment: Breaks down lignin bonds, enhancing digestibility.

3. Biological treatments:

Fungal treatment: White-rot fungi can break down lignin, improving digestibility.

Ensiling: Can improve palatability and preserve nutrients.

4. Supplementation:

Protein sources: Oilseed meals, legumes, or urea can address protein deficiency.

Energy sources: Grains or molasses can complement the low energy content of straw.

Minerals and vitamins: Essential to balance the diet and support overall health.

Feeding Recommendations

1. Cattle

Dairy cattle: Soybean straw can comprise up to 20-30% of the total dry matter intake, depending on production level and other diet components.

Beef cattle: In maintenance diets, soybean straw can make up 50-60% of the ration when properly supplemented.

2. Buffalo

Generally more efficient at utilizing low quality roughages compared to cattle. Can include soybean straw at 30-40% of the diet for maintenance, with appropriate supplementation.

3. Growing animals

Due to higher nutrient requirements, limit soybean straw to 20-25% of the diet for growing cattle and buffalo.

Practical Considerations

1. Gradual introduction: Introduce soybean straw gradually into the diet to allow rumen microbes to adapt.

2. Monitoring: Regularly assess body condition, milk production, and growth rates to ensure nutritional adequacy.

3. Water availability: Ensure ample clean water is available, as high-fiber diets increase water requirements.

4. Processing facilities: Consider the need for chopping or grinding equipment if feeding large quantities.

5. Storage: Proper storage is crucial to

prevent mold growth and maintain nutritional quality.

Conclusion

Soybean straw can be a valuable feed resource for cattle and buffalo, particularly in regions with significant soybean production or during periods of fodder scarcity. While its nutritional limitations necessitate careful diet formulation and supplementation, various treatment methods can enhance its feeding value. When properly utilized, soybean straw can contribute to cost-effective and sustainable ruminant production systems. As with any feed management change, it's advisable to consult with a livestock nutritionist or Veterinarian to develop a balanced feeding program tailored to specific animal needs and local conditions.