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UTILIZATION OF PINEAPPLE WASTE IN SILAGE PREPARATION FOR LIVESTOCK FEED

K.Sudha Rani[1]* and M.Ravi Kumar[2]

[1]*Assistant Professor, Department of Animal Nutrition, Sri Venkateswara Veterinary University, College of veterinary Science, C.V.Sc Garividi, Vizianagaram, Andhra Pradesh-535101

[2]Associate Professor, Department of Animal Nutrition, Sri Venkateswara Veterinary University, College of veterinary Science, C.V.Sc Garividi, Vizianagaram, Andhra Pradesh-535101

Corresponding author email: drsudha0606@gmail.com

ABSTRACT

The growing need for sustainable livestock feed has driven the exploration of agricultural by-products like pineapple waste, consisting of peels, cores, and crowns. This nutrient-rich by-product shows promise for silage production. This review covers the process of making silage from pineapple waste, highlighting its benefits and the considerations necessary for its effective use in livestock diets. By utilizing this waste, farmers can create an economical and environmentally friendly feed source, enhancing both livestock nutrition and sustainable farming practices.

KEYWORDS: Livestock feed, Nutritional value, Pineapple waste, Sustainable farming, Silage production

INTRODUCTION

Pineapple cultivation in India is significant, with major producing states including West Bengal, Assam, Karnataka, Kerala, Tripura, and Andhra Pradesh. The crop thrives in tropical climates with temperatures between 22°C and 32°C, annual rainfall of 1000-1500 mm, and well-drained sandy loam soils. India produces approximately 1.2 to 1.5 million metric tons of pineapples annually. Andhra Pradesh has about 2,000 to 3,000 hectares under pineapple cultivation, primarily in the Visakhapatnam district. The yield in Andhra Pradesh is comparable to the national average, around 15-20 metric tons per hectare. Pineapple waste, a significant by-product of the pineapple processing industry, often poses disposal challenges. The efficient use of agricultural by-products is essential for sustainable farming practices. Utilizing this waste for silage preparation offers an economical and environmentally friendly solution while providing nutritious feed for livestock. This article explores the methods, benefits, and challenges associated with using pineapple waste in silage production.

COLLECTION AND PREPARATION OF PINEAPPLE WASTE

Pineapple waste, including peels, cores, and crowns, is collected from processing plants, markets, or farms. The waste is chopped into small pieces (1-2 inches) to facilitate fermentation and improve packing density.

MIXING WITH FORAGE

Pineapple waste is mixed with forage crops (e.g., corn, grass, alfalfa) or dry materials (e.g., hay, straw) to balance moisture content and enhance nutritional value. A typical ratio of 70% pineapple waste to 30% forage is recommended.

PACKING AND SEALING:

The mixture is packed into silos, trenches, or plastic bags, ensuring tight packing to eliminate air and promote anaerobic conditions. The silage is then sealed with plastic sheets, weighed down to prevent air ingress.

FERMENTATION PERIOD:

The packed silage is left to ferment for at least 3 weeks, allowing beneficial bacteria to produce lactic acid, which preserves the silage.

BENEFITS OF PINEAPPLE WASTE SILAGE:

Nutritional Value: Over a 20-day period, high-quality silage was prepared, achieving an average pH of 4.2 and a lactic acid content of 6–7%. On a dry matter basis, the nutritive value of the Pineapple Waste silage was superior to conventional maize green fodder. This silage contained 52.0% total sugars, 7.50% crude protein, 56.04% neutral detergent fiber, 19.76% acid detergent fiber, 72% total digestible nutrients, 0.61% calcium, and 0.30% phosphorus. This enhanced nutritional profile makes the silage a more beneficial option for livestock feed compared to traditional maize fodder. Pineapple waste is rich in fiber and certain vitamins, contributing to a balanced diet for livestock. The fermentation process enhances the palatability and digestibility of the silage.

Considerations for Livestock Usage: Pineapple waste has high moisture content, which can lead to spoilage if not properly balanced with dry forage. Ensuring the right mixture is crucial for quality silage. Regular monitoring of the silage is essential to detect any signs of spoilage, such as mould or foul odour. Proper storage conditions must be maintained to preserve the nutritional value of the silage.

Introduction to Livestock Diet: Silage should be introduced gradually into the livestock diet to avoid digestive issues. A gradual transition helps animals adapt to the new feed and maximizes nutritional benefits. Feeding pineapple silage at 25% of diet improved the nutrient intake, energy balance, and body weight gain of growing Myanmar local cattle.

CONCLUSION

Using pineapple waste reduces feed costs by recycling agricultural byproducts that would otherwise be discarded. The utilization of pineapple waste in silage preparation presents a viable option for sustainable livestock feeding. The process not only offers a cost-effective and nutritious feed source but also contributes to waste management and environmental sustainability. Further research and practical implementation can enhance the efficiency and effectiveness of this approach, benefiting both the livestock industry and the environment.

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