



Revitalizing Sorghum Production in Support to Livestock Industry

S&T in Agriculture



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Key Findings and Policy Implications

- The most important finding is that a 21-day fermentation period produces the highest-quality sorghum silage, maximizing crude protein, improving digestibility, and ensuring better preservation.
- The 21-day fermentation also resulted in lower crude fiber and moisture content, enhancing feed intake and extending shelf life of the silage.
- The SV2 and SV3 varieties showed superior nutritional performance, with minerals such as calcium and phosphorus influencing fermentation efficiency, though prolonged fermentation may cause nutrient losses.
- Promoting optimal fermentation practices and high-performing varieties can improve feed

quality, livestock productivity, and overall feed security.

Background

Livestock production in many rural areas is constrained by the shortage of quality feed, particularly during dry seasons when natural pastures are limited. Farmers often rely on low-quality agricultural residues and weeds, resulting in poor animal performance and reduced productivity. Sorghum, a drought-tolerant and high-yielding crop, offers a viable alternative as a forage resource due to its adaptability to diverse environmental conditions and its suitability for silage production.

Silage making is an effective method of preserving forage and ensuring a stable supply of nutritious feed throughout the year. However, the quality of silage is influenced by several factors, including crop variety and fermentation duration. This study addresses the need to identify the optimal combination of these factors to improve silage quality and support livestock development.

Research Objectives

General Objective

- To develop and evaluate three sorghum varieties for silage production under different fermentation periods.

Specific Objectives

- To evaluate the nutritional quality of sorghum silage under varying fermentation durations.
- To identify the most suitable sorghum variety for optimal silage production.

Methodology

The study was conducted at Cagayan State University – Piat Campus using three sorghum varieties obtained from the Department of Agriculture. The experiment followed a simple random and ranking technique to evaluate the effects of different fermentation periods (14, 21, and 28 days) on silage quality. Sorghum plants were harvested at 75 days, chopped, and packed in airtight containers to facilitate fermentation. Samples were analyzed for proximate composition, including crude protein, crude fiber, crude fat, ash, moisture, and mineral content (calcium and phosphorus). Laboratory analysis was conducted to determine the nutritional value of the silage under each treatment.

Key Findings

- The 21-day fermentation period yielded the highest crude protein content and overall best silage quality.
- Crude fiber decreased with longer fermentation, improving digestibility and feed intake.
- Moisture content declined with extended fermentation, enhancing silage preservation.

- The variety SV2 and SV3 varieties showed superior nutritional performance, particularly in crude protein content.
- Calcium and phosphorus influenced microbial activity and fermentation efficiency.
- Prolonged fermentation (28 days) may lead to nutrient losses..

Table 1. Proximate Composition of Sample Analyzed for Percentage Dry Basis.

Component	Variety	14 days	21 days	28 days
1. Crude Protein	SV ₁	8.26	8.79	7.57
	SV ₂	8.61	10.23	8.82
	SV ₃	10.58	10.59	9.00
2. Crude Fiber	SV ₁	26.87	24.92	24.90
	SV ₂	27.49	26.26	24.74
	SV ₃	26.15	25.48	24.70
3. Crude Fat	SV ₁	2.55	2.54	1.12
	SV ₂	3.53	2.85	2.66
	SV ₃	3.05	2.86	2.53
4. Ash	SV ₁	7.09	6.51	6.36
	SV ₂	7.97	7.45	6.34
	SV ₃	8.43	7.84	6.34
5. Moisture	SV ₁	83.88	77.67	77.43
	SV ₂	83.87	72.59	73.68
	SV ₃	82.09	76.43	75.03

Conclusion

The study confirms that sorghum is a viable and sustainable feed resource for livestock, particularly when processed into silage under optimal conditions. The 21-day fermentation period and the use of superior varieties such as SV2 and SV3 significantly enhance silage quality. Adoption of these practices can improve feed availability, increase livestock productivity, and contribute to agricultural sustainability.

Policy Recommendations

- Promote the adoption of sorghum silage production among livestock farmers, especially in feed-scarce areas.
- Standardize the 21-day fermentation period as a recommended practice for optimal silage quality.
- Encourage the use and distribution of high-performing sorghum varieties such as SV2 and SV3.
- Strengthen farmer training and extension services on proper silage-making techniques.
- Support further research on additional sorghum cultivars and fermentation conditions.

- Integrate sorghum silage production into livestock development and climate adaptation programs.

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Target Policy Actors and Beneficiaries



Editor's Note

This policy brief is based on results of the CSU-funded project "Development and evaluation of three sorghum varieties under different fermentation period for silage production" This project was implemented by the Cagayan State University - Piat Campus. The CSU - Piat Campus project team is composed of Dr. Michael M. Uy



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