

QUALITY AND ACCEPTABILITY OF CASSAVA PEEL and *GLIRICIDIA SEPIUM* PELLETS FED TO SOKOTO GUDALI CATTLE

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ABSTRACT

Cattle production plays a critical role in meeting the global demand for animal protein, however the challenge of inadequate nutrition to meet the energy-protein requirement of cattle especially during the dry season has limited their productivity. In Nigeria, Cassava and *Gliricidia* are valuable feed resources that can serve as an alternative feed ingredient which are abundant, affordable but this is dependent on methods of processing and preservation. This study evaluated the quality and acceptability of Cassava-*Gliricidia* pellets as a feed alternative for Sokoto Gudali cows. Three treatments (Treatment 1=75% CP: 25% GL, Treatment 2=50% CP: 50% GL, Treatment 3=25% CP: 75% GL) were adopted for the pellet feed production. Nine Sokoto Gudali cattle were used for the acceptability study using cafeteria method which lasted for 30minutes daily for seven days. The crude protein content of the pellets ranged from 10.11 to 12.02%. Physical quality was measured in term of durability. Pellet preference considered in terms of intake rate showed that cows exhibited a high preference for the Cassava-*Gliricidia* pellets in T1 to other pellets used in this study. The pellets also reduced feed wastage and enhanced overall feed conversion efficiency. This study suggest that Cassava-*Gliricidia* pellets may be a viable and nutritionally balanced feed option for cattle.

Keyword: Cassava, *Gliricidia*, Feed acceptability, Sokoto Gudali, Pellet Durability Index

INTRODUCTION

The unavailability of sufficient forage during the dry season in tropical and subtropical regions is a major problem in ruminant livestock production (Olorunnisomo, 2011). In many developing countries, conventional feed ingredients such as maize, wheat bran, and soybean meal are expensive and sometimes unavailable, limiting the profitability and sustainability of cattle production (Adeyemi *et al.*, 2020). Researchers and livestock producers have therefore looked at alternative feed sources to lessen reliance on pricey traditional feeds while preserving the best possible performance from cattle. Among these alternatives, cassava peels (a by-product of cassava processing) and *Gliricidia sepium* (a fast-growing, nitrogen-fixing leguminous tree) have emerged as promising feed components due to their nutritional benefits and cost-effectiveness (Egbetokun *et al.*, 2021).

Cassava peels are an abundant energy-rich feed resource that can replace maize and other cereals in cattle diets. The combination of cassava peels and *Gliricidia* leaves in pellet form offers a nutritionally balanced, low-cost feed alternative that enhances feed efficiency and reduces waste. Pelletizing improves the uniformity, handling, and intake of feed.

The integration of cassava-*Gliricidia* pellets into cattle diet could enhance growth performance, milk yield, and overall health, making livestock production more economically viable. However, the success of this feed alternative depends on its acceptability, palatability, and nutritional adequacy. This study was therefore conducted to determine the quality and acceptability of pellets produced from cassava peels and *Gliricidia sepium* leaves by cattle.

MATERIALS AND METHODS

Experimental site

The experiment was conducted at the Dairy Unit of the Teaching and Research Farm (TRF), University of Ibadan, Ibadan, Nigeria (3°45 E, 7°27 N; at 220m above sea level).

Forage materials

Gliricidia sepium leaves were harvested from the existing plantations at the TRF. The leaves were separated and air dried to a constant moisture level and thereafter bagged. It was then ground into meal form at the feed mill of the Teaching and Research farm. Cassava peel was purchased from a reputable factory in Ibadan, Oyo state. It was sun dried and then milled into flour. The milled cassava peel (CSP) and *Gliricidia* (GL) meal are then blended in the following treatment.

Treatment 1: 75%CSP and 25% GL

Treatment 2: 50%CSP and 50% GL

Treatment 3: 25%CSP and 75% GL

Preference and Acceptability Trial

Nine Sokoto Gudali cattle were used for the acceptability study. The method used is the cafeteria method of feeding. Separate large feeders were used to enable the nine (9) animals feed simultaneously over a period. The

animals were served 10kg each of the treatments and were replicated twice. Feeding was allowed for a period of 30 minutes daily for 15days; 10days for adaptation and 5days collection period. Average daily intake was calculated by deducting the leftover from the feed offered. Feed sample with Coefficient of Preference (CoP) less than 1 was considered poorly accepted, while CoP greater than 1 was greatly accepted.

Durability measurement

The durability of the pellets was evaluated using Friability Test Apparatus. Twenty pieces from each treatment was placed in a tumbling box and allowed to spin for 100 rpm. The samples were recovered, and the fines were separated from the pellets.

Statistical analysis

The experiment was in a completely randomized design. The data obtained were subjected to analysis of variance using SAS (2008). Means were separated using the Duncan multiple range test.

RESULTS AND DISCUSSION

The result of the proximate composition of the experimental diets is presented in Table 1. There was significant difference ($p < 0.05$) in the DM content of the feed, the values ranged from 86.66% to 91.43%. The highest value was observed in T1. Crude protein and fiber fraction of the feed also showed significant differences across the group. The highest CP value (12.02) recorded in T3 is associated with increased level of *Gliricidia sepium* leaves (Olorunnisomo and Fayomi, 2012) in the diet. The CP value ranged from 10.11 to 12.02, this is well above 8% suggested by Norton (1994) for effective ruminal function.

Table 1: Proximate composition (%) of Pellets

Nutrient (%)	T1	T2	T3	SEM
DM	91.43 ^a	90.47 ^{ab}	86.67 ^b	0.19
CP	11.84 ^a	10.11 ^b	12.02 ^a	0.01
NDF	53.51 ^b	55.31 ^a	55.63 ^a	0.04
ADF	38.37 ^c	40.37 ^b	41.63 ^a	0.03
ADL	15.34 ^c	16.26 ^b	16.70 ^a	0.02

^{a-c} Means in the same rows with different superscripts are significantly different ($p < 0.05$)

DM = Dry matter content, CP = Crude Protein, NDF = Neutral detergent fiber, ADF = Acid detergent

Presented in Table 2 is the pellets durability index (PDI) and hardness of pellets made from *Gliricidia sepium* leaves and cassava peels. The pellet hardness value of 49.36 N for T3 was significantly ($p < 0.05$) higher than 46.29 N for T1 and 38.55N for T2. However, no significant difference was observed in the PDI value across the treatments. The value ranged from 99.33% to 99.54%. Table 3 shows the acceptability of the experimental diets. There was significant difference ($p < 0.05$) in CoP across the treatments. T1 was considered acceptable by the cattle with CoP of 1.81 while T3 was the least accepted with CoP of 0.24. This was in accordance with the work of Olorunnisomo and Fayomi, 2012, who observed an increase in preference with higher proportion of cassava peel.

Table 2: Pellet hardness and durability

Parameter	T1	T2	T3	SEM
Hardness (N)	46.29 ^a	38.55 ^b	49.36 ^a	0.18
Durability (%)	99.51	99.33	99.54	0.02

^{a-b} Means in the same rows with different superscripts are significantly different ($p < 0.05$)

N = Newton, SEM = Standard error of the means

Table 3: Acceptability of pellets made from *Gliricidia sepium* leaves and cassava peels

	T1	T2	T3	SEM
CoP	1.81 ^a	0.94 ^b	0.24 ^c	0.00
%Pp	60.69 ^a	31.35 ^b	7.96 ^c	0.15

^{a-c} Means in the same rows with different superscripts are significantly different ($p < 0.05$)

Cop = Coefficient of Preference, %Pp = Percentage Preference

CONCLUSIONS

In conclusion, Sokoto Gudali cattle could be successfully managed on pelleted feed mixture under an intensive system in the tropics based on the current experimental condition. The 75:25 CSP-GL ratio was highly

acceptable with a reasonable level of durability percentage. It is therefore recommended as the optimal formulation; it can be used as feed for cattle during dry season

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