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PERFORMANCE OF UDA RAMS FED SORGHUM HUSK ENSILED WITH SOYA BEAN MEAL AND POULTRY LITTER

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ABSTRACT

Study was conducted at Usmanu Danfodiyo University Teaching and Research Farm Sokoto, to assess the performance of Uda rams fed sorghum husk ensiled with soybean meal (SBM) and poultry litter. Sixty three (63) days feeding trial was conducted using twelve (12) growing Uda rams. Silage was prepared using 70% sorghum husk and varying levels of SBM and poultry litter across the treatments i.e. 70% sorghum and 30% SBM, 70% sorghum husk and 30% poultry litter, 70% sorghum husk, 15% SBM and 15% poultry litter for treatment A,B, and C respectively. The ensiled diets were fed at the rate of 60:40 ensiled to concentrate. The results showed the chemical composition of experimental diet crude protein (CP) content was lower (13.78%) in treatment B and higher (14.84%) in treatment A. While crude fiber (CF) content increased from 22.13% in treatment A to 25.57 in treatment C. Ether extract varied between 6.52% (treatment A) and 7.67% treatment C. Feed intake was higher in treatment with SBM (soybean med). Average daily gain (ADG) obtained from the animals range from 72.38-186.51kg/day, from treatment D (control) to treatment A. Cost of feed per kg weight gain indicated that, treatment A was significantly lower (N429.77/kg) ($P<0.05$) compared to other treatments. Silage containing 70% sorghum husk and 30% soybean meal was better due to lesser cost of production.

INTRODUCTION

Livestock play an important role in dry land management because livestock production is the main activity that sustains livelihoods in those low productivity and unstable environment. The semi-arid and a sub-humid zones host over 90% of cattle and 70% of sheep and goat population (RIM, 1992). Sheep are valuable domestic animals in the tropical livestock production system. Sheep in the tropics account for approximately 34% of the total population of the world grazing ruminants and represent a valuable resource in most developing world. Sheep contribute significantly in converting feed resources into products of economic value as meat, wool, and milk. However, the conversion of feed material to those products would not come easily without a cost. In many arid and semi-arid areas of the world, uneven rainfall distribution leads to wide fluctuations in the quantity and quality of forage available to animals. Furthermore, there are increasing indices towards intensification of livestock production in Nigeria (Muhammad *et al*., 2007). The main challenge is ruminant quality feeds year in year out (Kallah *et al*., 1997).

Materials and Methods

Description of Experimental site

The experiment was conducted at the Usmanu Danfodiyo University Livestock Teaching and Research Farm. The farm is situated within the main campus of the university at about 10km north of Sokoto metropolis in

Wamakko Local Government Area. Sokoto state has a semi- arid climate, which is characterized by low rainfall, in which the mean annual rainfall is about 700mm although, rainfall vary in amount from year to year.

Sourcing of Experimental Feed Ingredients

Maize cobs was purchased from Zamfara State, and crushed using grinding machine. Soybean meal and cotton seed cake has been purchased from Kano and Funtua respectively and ingredients for concentrate diet was

purchased from Sokoto Kara Market. Poultry litter was obtained from Chick Tech Farm Kasarawa Area Sokoto State.

Ensiling of Experimental Feeds (basal diets)

The silage was prepared using maize cobs fortified with soybean meal and poultry litter as shown in the Table 1. Forty percent water by the weight of the feed to be sprinkled on the diet before ensiling. The mixture has been thoroughly mixed and poured into 120 liter containers, then compressed using stones until filled to the brim without air space. The top of the containers has been covered tightly with nylons to provide anaerobic environment suitable for fermentation, then covered with the lid and stones placed on the top. The treatment and proportions of the ingredients are shown in Table 1. The experimental treatments we're designated as treatment A, B, C, and D in which represent the control diet.

Table 1: Gross Composition of Ensiled Experimental Diets Treatments

TREATMENTS			
Ingredients (%)	A	B	C
Sorghum husk	70	70	70
Soybean Meal	30	-	15
Poultry litter	-	30	15
Total	100	100	100

Formulation of Control Diet

Control diet designated as treatment D (Table 2) was formulated and consist: 20 percent ground nut haulms, 20 percent cowpea husk, 24 percent wheat offal, 25 percent cotton seed cake, 10 percent rice milling waste, and 1 percent salt which will give a calculated crude protein of 16 percent, crude fibre 24 percent, ether extract 4 percent and energy of 2023kcal/kg ME.

Table 2: Gross Composition of Control Diets

Ingredients	**% inclusion level**
Groundnut haulms	20
Cowpea husk	20
Wheat offal	24
Cotton Seed Cake	25
Rice milling waste	10
Salt	1
Total	**100**
Calculated crude protein (%)	16
Calculated crude fibre	24
Calculated energy (kcal)	2023

Formulation of Concentrate Diet

Concentrate diet has been formulated using maize, cotton seed cake (CSC), wheat offal, cowpea husk and salt as outlined in Table 3.

Table 3: Gross of Concentrate Diet

Ingredients	**% inclusion level**
Maize	19
Cotton Seed Cake	30
Wheat offal	30
Cowpea husk	20
Salt	1
Total	**100**
Calculated crude protein (%)	16.21
Calculated energy (kcal)	2081.8

Experimental Animal and their Management

Twelve (12) entire male Uda lambs weighing between 20- 25 kg were purchased from Achida market in Sokoto State for the experiment. The lambs were transported to the Livestock Teaching and Research Farm. Usmanu Danfodiyo University, Sokoto located at the permanent site of the university. The lambs were quarantined, dewormed with Sambizole 11 dewormer at the rate of 3mls/kg live weight of the animal and sprayed against ecto-parasites by use of Trictic and treated with oxytetracycline HCL at the rate of 1ml/kg live weight (a blood spectrum antibiotic) administered intramuscularly. The lambs were group fed and managed intensively for two weeks before of the commencement of the experiment. The animal's weight were balanced for each treatment and then allocated to four treatment diets with three replicate each. The lambs were housed individually in a pen measuring 1 x 1 meter.

Experimental Design and Feeding Procedure

Completely randomized design (CRD) (Steel and Torrie, 1980) was used in this experiment with number of animals representing replicate. Three (3) animals were for each treatment and has been balanced for weight. The pens has been disinfected and each animal was assigned to one of the experimental diet and fed *ad libitum* for 63 days at the rate of 60:40 ratio basal to concentrate diet. Water was also be made available always.

Data collection

Feed intake and weight measurement

The animals are weighed prior to the commencement of the experiment and subsequently on the same day of every week between 9-10am after withdrawing feed for 14-16 hours, to avoid error due to gut fill. Daily record of both feed intake was taken throughout the 63 days of the feeding trial.

Statistical Analysis

The data generated from the experiment were subjected to analysis of variance (ANOVA) using CRD design as outlined by (Steel and Torrie, 1980). Significant differences between the treatments means has been indicated using (LSD) Least Significant Design. At ($p<0.05$) level of significant.

Results and Discussion

Results on the performance of Uda rams fed ensiled sorghum husk with poultry and soybean meal were presented in (Table 4) from the Table it could be seen that final weight, average daily gain, feed intake and dry matter intake were significantly ($P>0.05$) similar in treatments A, B and C but varies in treatment D which is the control had significantly ($P<0.05$) lower value compared to the rest of the treatments.

The high feed intake observed in this study may be attributed to the fact that all the feed ingredients used are known to be palatable to ruminants (Topps, 1995). Likewise, (Nelson *et al.*, 1976) reported that increased moisture content of silage material brought about by increase in fermentation which includes anaerobic respiration and can lead to higher intakes of silage feed. This could also be because of the palatability of the ensiled diets. The ADG (73-187g/day) obtained in the present experiments comparable with the values (120-144g/day) reported by (Muhammad *et al*., 2016). However, the higher ADG obtained in the present study might be due to the fact that Uda sheep are known to have higher growth rate compared to Yankasa and West African dwarf sheep (Maigandi and Nasiru, 2006).

Feed Intake and Live weight Changes

Table 4: Performance of Uda rams fed ensiled sorghum husk with soybean meal and poultry litter

	Treatments				
Parameters	A	B	C	D	SEM
Initial weight (kg)	22.33	23.33	23.67	22.00	1.60
Final weight (kg)	38.00^{a}	34.57^{a}	34.00^{a}	28.08^{b}	1.75
Weight gain (kg)	15.67^{a}	11.24^{ab}	10.33^{ab}	6.08^{b}	1.33
Average daily gain(g)	186.51^{a}	133.81^{ab}	122.97^{ab}	72.38^{b}	15.79
Feed intake (g)	1116.67^{a}	1046.67^{a}	1075.00^{a}	776.67^{b}	71.51
FCR	6.32^{b}	7.80^{ab}	8.78^{ab}	11.68^{a}	1.16
DMI(g/kg)	1002^{a}	900^{a}	920^{a}	670^{b}	500
OMI(g/kg)	90.67^{b}	90.23^{b}	91.40^{ab}	93.47^{a}	0.61
DMI as % body weight	2.68	2.60	2.71	2.39	2.59

a,b,: means in the same row with different superscripts differ significantly ($p<0.05$), FCR= Feed Conversion Ratio; DMI = Dry Matter Intake; OMI= Organic Matter Intake.

Cost of Production

The results shows that the average daily cost of feed consumed in A, B and C is the same (P>0.05). However, the average daily cost of feed consumed in treatment D is lower in treatment D compared to treatment A, B and C.The results shows that the cost per kg weight gain in treatment A, B, and C are the same (P>0.05), likewise in treatment B, C and D. The cost of the feed per kg weight gain is lower in treatment A compared to that in treatment D.

The ensiled diets have a relatively lower cost of feed compared to the control diet. The average daily cost of feed consumed (N/kg) is higher in treatments A, B and C because the feed intake is higher in those treatments compared to the control diet. However, the cost per kg weight gain is lower for the ensiled diets because the ensiled diets have a better (lower) FCR than the control diet.

Table 5: Cost of production of Uda rams fed ensiled sorghum husk with varying levels of SBM and poultry litter waste

	Treatments				
Parameters	A	B	C	D	SEM
Average daily cost of feed consumed (N/kg)	75.93^{a}	71.19^{a}	73.10^{a}	52.81^{b}	4.86
Cost of feed per kg weight gain	429.77^{b}	530.53^{ab}	597.34^{ab}	794.53^{a}	0.22

a,b,: means in the same row with different superscripts differ significantly at (P>0.05)

Conclusion

Average daily gain (ADG), feed intake and crude protein (CP) were higher at treatment A (70% sorghum husk and 30% soybean meal). Cost of feed per kg live weight gain was significantly lower for animals fed treatment A. The observation indicated the suitability of ensiling 70% sorghum husk and 30% soybean meal.

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