

## **Effect of Ensiled Rice Husk with Graded Levels of Doum Palm Molasses on the Growth Performance of Ram**

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**Abstract:** The 84 days feeding trial was conducted to determine the performance of Rams fed graded level of Doum Palm Molasses on the Growth Performance of Ram, a total of Forty-eight (48) rams of the non-descript breed was used for this study, the animals were allocated to treatments constitute a 4 x 3 factorial experimental design, the factors being graded level molasses (sugar cane 5 and doum palm 2.5, 5 and 7.5%) and treatment periods (7, 14 and 21 days). 4 treatments in each period of ensilage; four (4) animals were randomly allocated to each treatment each period of ensilage. T1 as control (sugar cane molasses at 5%), while Doum palm molasses was used at 2.5, 5 and 7.5 and poultry dropping at 15% (T2, T3, T4 and T5 respectively) which was dissolved in 30 liters of water and sprinkled on remained kg with rice husk for period 7, 14 and 21 days in a 300 liter capacity Plastic water reservoir as silo in triplicate. The animals were housed in individual pens with adequate ventilation. The animals were balanced for weight before commencement of the experiment and weighed weekly thereafter throughout the experimental period. The experimental diets (ensiled rice husk with 10% cotton seed cake) were offered at 4% of body weight while groundnut haulm was fed ad libitum as basal diet. Feed intake was determined as the difference of the amounts of feed offered and the refusals. Water will be offered daily and leftover was measured and the experiment lasted for 84 days (12 weeks). The rams were weighed individually on weekly basis using a hanging weighing balance to estimate body weight change. Feed conversion ratio was measured using mean feed intake (kg) divided by mean body weight gain (kg). The results of all the growth parameter measured shows no significant difference ( $P < 0.05$ ) among the various treatment groups however, values for T4 were numerically higher than the others, which could be due to higher inclusion level of the doum palm and 21 days of ensilaged which might lead to adequate fermentation and increase in nutrients content of the materials, an indication that increasing levels of doum palm molasses result in increased performance of fattening rams

**Keywords:** Ensiled, Ram, Doum, Molasses, performance

### **INTRODUCTION**

Sheep is an important livestock species in the socio-economic lives of people around the world including Nigerians (Amin *et al.*, 2018). Sheep provide meat, milk, skin, fibre, and manure to large number of low income, marginal farmers and landless labourers (Kolo *et al.*, 2018). In Nigeria, livestock experience persistent serious shortage of feeds, especially during the dry season. The major problem in sheep productivity is; limited quantity and quality of feed resource (Nsahlai *et al.*, 1998). Possible way to reduce the challenge of inadequate feed supply and maintain production is to utilised crop residues which cannot be consumed by man but can be converted by ruminants into desirable products (Odeyinka, 2011).

Crop residues are parts of crops that remain after the removed of edible portions by human. Crop residues, traditionally considered as agricultural waste after extraction main products which include stovers, straws, husks, cobs, haulms and other leftovers from crop production. The several million metric tons of crop residues are annually produced in Nigeria to feed ruminant (Kolo *et al.*, 2017). Nigeria produced annually over 111.5 million tones of crop residues (Lufadeju 1988).

In general, crop residues are characterized by low content of nutrients which limit their utilization by livestock. Crop residues from cereals crops have low crude protein and high fiber, (Daniel, 1988 and Solomon, 2004). Consequently, when crop residues are fed to ruminants, their intake and digestibility are low, resulting in low level of performance. Crop residues are potentially rich in some sources of energy as about 80% of their DM consists of polysaccharide, but usually underutilized because of their low digestibility, which limits feed intake (FAO, 2002). Rice husks also constitute another by-product of rice production. However, they are not as important as rice straw or rice bran for the feeding of ruminants because of its low nutritional value it is however a valuable source of roughages for ruminants. Rice husks can be milled into a fine powder and used as diluents of other high energy feed stuff. Rice husk can be included in small amounts (15%) in high-concentrate diets for feedlot cattle to help furnish bulk, stimulate appetite and decrease incidence of liver abscesses (feedipedia, 2002). the problem of Rice husk is high silica, high fibre and abrasive nature make its degradation difficult thereby limiting its utilization as feed ingredient for animals (Ikpe *et al.*, 2019). Improved utilization of crop residues can be achieved either through appropriate supplementation or treatment both of which facilitate the microbial breakdown of plant cell wall (Kolo *et al.*, 2017).

## **Material and Methods**

### **Experimental Site**

The experiment was conducted at the Livestock Teaching and Research Farm, Department of Animal Production Technology, Ramat Polytechnic. Maiduguri lies within latitude 11°50'N and longitude 13°09'E and has an elevation of 320m above mean sea level (BOSHIC, 2007). The mean ambient temperature could be as low as 23°C during the harmattan season and gets as high as 40°C or more during the hot season. Relative humidity is about 45% in August which usually drops to about 5% in the months of December and January and has evaporation of 203 mm/year. Day length varies from 11 to 12 hours (BOSHIC, 2007).

### **Doum palm molasses preparation**

The doum palm molasses was prepared by 1kg doum palm pulp cover in 2, 3 and 5 litter water and put to boiling for 15 minutes and allowed to cool for about an hour sieving with sieve size of about 45u and 140 x 90mm size was used. The best doum palm molasses based on the viscosity will be selected for trial, and physicochemical analysis while sugarcane molasses was obtained from sugar industry serve as control.

### **Preparation poultry dropping**

Poultry dropping was source from poultry unit and Fresh samples was properly sundried. All the samples were ground to pass through 1mm sieve. Poultry dropping of 15kg was dissolved in 30 liters of water.

### Ensiling procedure

As control (sugar cane molasses at 5%) as T1, while Doum palm molasses was used at 2.5, 5 and 7.5 and poultry dropping at 15% (T2, T3, T4 and T5 respectively) was dissolved in 30 liters of water and sprinkled on remained (Table I) kg with rice husk for period 7, 14 and 21 days in a 300 litter capacity Plastic water reservoir as silo in triplicate. The proportions % are presented in Table 1.

### Experimental Design

The treatments constitute a 4 x 3 factorial experimental design, the factors being graded level molasses (sugar cane 5 and Doum palm 2.5, 5 and 7.5% ) and treatment periods (7, 14 and 21 days).

### Experimental animal and their management

Forty-five (45) rams of the non-descript breed was used for this study. The experimental animals were sourced from Livestock Market in Maiduguri, Borno state. The animals were dewormed with Ivermectin 5% against internal and external parasites at 1ml/50kg body weight before commencement of the experiment. Also Oxytetracycline (a broad-spectrum antibiotic) long acting base was given at 1m/10kg body weight and multivitamin injection was also given at 1ml/10kg body weight for three days to reduce stress. Before commencement of the experiment the animals were adapted for one week during which groundnut haulms *ad libitum* and above ensiled rice husk with 10% cotton seed cake was given to the animals. The animals were housed in pens which have wide windows for adequate ventilation.

### Experimental design and Feeding

The animals were allocated to treatments constitute a 4 x 3 factorial experimental design, the factors being graded level molasses (sugar cane 5 and doum palm 2.5, 5 and 7.5%) and treatment periods (7, 14 and 21 days). 4 treatments in each period of ensilage; four (4) animals were randomly allocated to each treatment each period of ensilage. The animals were housed in individual pens with adequate ventilation. The animals were balanced for weight before commencement of the experiment and weighed weekly thereafter throughout the experimental period. The experimental diets (Table 1) (ensiled rice husk with 10% cotton seed cake) were offered at 4% of body weight while groundnut haulm was fed *ad libitum* as basal diet. Feed intake was determined as the difference of the amounts of feed offered and the refusals. Water will be offered daily and leftover was measured and the experiment lasted for 84 days (12 weeks).

**Table 1: proportion (%) of rice bran ensiled with fruit molasses**

Factors		Rice bran	Poultry litter %
Molasses	Cane 5%	80	15
	Fruit 2.5	82.5	15
	Fruit 5	80	15
	Fruit 7.5	77.5	15
Treatment period (days)	7		
	14		
	21		

## **Data collection**

### **Measurements of productive parameters**

#### **Feed intake**

Feed consumption from each treatment was measured on daily basis by subtracting left over from feed served per sheep. Adequate measures were taken to safeguard against spillage and related wastage.

#### **Weight change**

The rams were weighed individually on weekly basis using a hanging weighing balance to estimate body weight change.

#### **Feed conversion ratio**

Feed conversion ratio was measured using the formula below:

$$\text{Feed conversion ratio} = \frac{\text{Mean feed intake (kg)}}{\text{Mean body weight gain (kg)}}$$

## **Statistical Analysis**

Data obtained are subjected to 4 x 3 factorial experimental design and significant difference between treatment means were separated using the Duncan's multiple range test at  $P < 0.05$

## **RESULTS AND DISCUSSIONS**

### **PROXIMATE COMPOSITION OF THE EXPERIMENTAL DIET**

The chemical composition of the individual feed ingredients is presented in Table 2. Dry matter content of the treatments ranges between (86.00%) in T1 and (88.00%) in T5. This dry matter content indicates all constituents excluding water of the ingredients used in the formulation. The value is comparable to the range obtained elsewhere for based diets as reported by Tona et al., (2014). CP level decreases as the RHD concentration increases. Crude protein (CP) content was higher in T1 (8.0 %) and lower in T3 (12.00%). However, the crude protein values recorded for diets in this study were within the critical range of 8 to 12% reported (Isah et al., 2012). Differences and variation in crude protein percentage among formulations may be due to the type of protein source and its level of inclusions in the rations. The differences observed could also be associated with the used of poultry dropping. The highest value of ether extract (EE) was obtained in diet 2 (10.00 %) and the lowest was recorded in diet 1 (9.00). Higher ether extract has the tendency to reduce dry matter feed intake and may decrease effective digestibility. Hence having this diet formulation will be an added advantage to the animal fed with the diets. It has been reported that NDF content of feed can be used to predict the feed intake since it measures the total fibre component of feed.

**Table 2. proximate composition of the experimental diets**

Constitutes	T1	T2	T3	T4	T5
Dry Matter	86	87	86	86	88
Crude Protein	8.0	11	9.0	10	12
Ether Extracts	9.0	12	10	11	10
Crude Fibre	15	18	17	19	18
Ash	3.0	3.5	4.5	4.0	4.5
Nitrogen Free Extract	42	42.5	45.5	47	42

**Table 3. Growth performance of Rams fed graded level of doum palm molasses in ensiled Rice Husk**

Parameter	T 1	T 2	T 3	T4	T5	SEM
Induction body weight (kg)	21.39	21.91	23.92	21.91	21.39	2.56 <sup>NS</sup>
Body weight gain (kg)	12.10	13.09	13.61	14.09	12.28	2.22 <sup>NS</sup>
Average daily gain (g/day)	192.10	207.70	216.10	223.6	194.90	35.20 <sup>NS</sup>
Feed intake (g/day)	896.00	983.00	973.00	931.0	911.00	77.00 <sup>NS</sup>
Feed conversion ratio (g/g)	4.71	4.89	4.67	4.23	4.65	0.95 <sup>NS</sup>

SEM=Standard error of mean, NS= Not significant.

The results of all the growth parameter measured shows no significant difference ( $P < 0.05$ ) among the various treatment groups however, values for T4 were numerically higher than the others, which could be due to higher inclusion level of the doum palm and 21 days of ensilaged which might lead to adequate fermentation and increase in nutrients content of the materials

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