# CARCASS YIELD OF RED SOKOTO GOATS FED DIFFERENT FORMS OF NEEM LEAVES, SUPPLEMENTED WITH A CONCENTRATE DIET.

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***ABSTRACT***
*The study evaluated the carcass characteristicsof red sokoto goats fed different forms of neem (Azadirachta indica) leaves and concentrate diet. The experiment was carried out at the small ruminants unit Teaching and Research Farm, Federal University of Kashere. Sixteen red sokoto goats (bucks) were allotted into four (4 ) treatments of four goats each. The goats were fed fresh neem leaves, neem leaves hay, neem leaves meal and neem leaves silage at 300g/goat/day for treatments 1, 2, 3 and 4 respectively; and concentrate diet at 125g/goat/day for a duration of sixty three (63) days. Water was served the goats ad libitum.On the last day of the experiment 3 goats from each treatment were slaughtered,bled, eviscerated, dressed and used to determine the carcass yield parameters. The experimental design was a completely randomized design; data were analyzed using a one way analysis of variance. The significant means were separated using Least Significant Difference contained in SAS 9.4 statistical packages, 2018 edition. The concentrate and the neem leaves were analyzed for their proximate composition using the method of AOAC(2000) The slaughter and meat to bone ratio values were not significantly (P.<0.05)different. The dressed weight and dressing percentage values ranged from 3.97 to 4.50 kg and 46.21 to 58.96% , both values were significantly(P>0.05)different. It was therefore concluded that the goats in treatment 1 had the best carcass yield parameters. Further experiments using other classes and breeds of goats as well as other species of ruminants was suggested.*

**Keywords:** Carcass Yield Feed Intake,RedSokotoGoats,NeemLeaves,Supplement

## 1 INTRODUCTION

Many researchers have advocated the use of leaves from trees that retain their leaves during the long dry season to feed ruminants ( Ocheja *et al*, 2022: Ibrahim *et al* 2022;Bhowmik *et al* 2010). Contemporary ruminant feeding in a developing country like Nigeria is partly geared towards searching for inexpensive readily available feed resources, which can partially or wholly serve as substitute for the scarce expensive feed stuffs and inadequate forage (Okoruwa and Adewumi, 2010)The main problem confronting ruminant livestock producers in Nigeria today is the seasonal fluctuation in the availability of forages for ruminant. The use of leaves from trees that retain their leaves during the long dry season,to feed ruminants during the difficult period is very important .one of such leaves that can be used is leaves from Neem *(Azadirachta indica)* tree.

It is important to use leaves from trees to feed goats during the long dry season, due to unavailability of grasses. Neem leaves as supplement to basal diets of crop residues have been shown to improve feed utilization and animal performance in ruminants (Raghuvansi *et al.,* 2017). Neem leaves are high in crude protein. There are, however, wide variations in the reported values. Crude protein concentrations between 17.5% and 18.7% have been reported (Bhowmik *et al.,* 2010). According to Oguche *et.al*.(2018), the nutrition of an animal reflects in the meat quality and meat quality depends largely on the nutritive value , proximate and mineral composition of the feeding materials. The value of a goat carcass depends on the quality of edible parts available for sale and the nutrition of goats have been reported to manifest in the meat quality (Steele, 1996). The ideal carcass can be described as one that has a minimum quantity of bones, a maximum quantity of muscle and an optimum quantity of fat.

The feeding of ruminants should be geared towards producing animals with goodcarcass yield and quality( Ocheja *et al* 2020: Oguche *et al* 2017)

This study was therefore designed to determine the carcass yield, of red Sokoto goats fed different forms of neem leaves and a concentrate diet.

## 2 MATERIALS AND METHODS

**Experimental site**

The study was conducted at the Teaching and Research Farm, Faculty of Agriculture, Federal University of Kashere in Gombe State, Nigeria. The state is situated within latitude 9º54'46N and longitude 9º 46º'27E and 10º57º E and altitude of 349m above sea level. The annual rainfall of Kashere ranges between 800mm-900mm per annum and is characterized by distinct dry season (October-May) and rainy season (June-September) seasons. The annual mean temperature ranges from 30-32$^0$ C and it experiences a relative humidity of 17-90% (National Geospatial Intelligence Agency, 2012).

**Experimental Animals, Management, Feed preparation and Experimental procedure**

Sixteen (16) red Sokoto goats aged between 7-9 months were sourced from within Kashere and its environs and randomly allocated into four (4) Treatments of four (4) goats each. The animals were treated with Ivomec for endo and ecto parasites control at 0.3ml each and oxytetracycline, hydrochloride and procaine penicillin at 2.0ml each to take care of scouring and nasal discharge and to provide a common health status. The Neem (*Azadirachta indica)* leaves used for this experiment were collected from within the Federal University of Kashere Campus. The consisted of Bambara nut offal (BNO), Beans offal meal (BOM), Cassava peel meal (CPM), Yam peel meal (YPM), Maize offal (MO), Full fat soya bean (FFSB), Egg shell meal (ESM), Wood ash (Ash). These components were thoroughly mixed after pounding and grinding as the case may be. Each treatment had (4) goats, each goat was fed 125g of the concentrate per day, and the Neem leaves at 300g per Goat per day of which the Neem leaves was fed first, then the concentrate one hour later, the Goats were served known volume of water and the water intake of the goats were determined by subtracting volume of water consumed by the goats from the volume served also taking cognizance of evaporation .loss

Treatment one ($T_1$) was fresh neem leaves; treatment two ($T_2$) was neem leaves hay; treatment three ($T_3$) was neem leaf meal and Treatment four ($T_4$) was neem leaves silage.

The concentrate offered the goats were weighed daily and the left over was also weighed and subtracted from the quantity of feed that was served to determine the feed intake of the animal. The experiment lasted for sixty three (63) days.

**Carcass Yield Determination**

At the end of the sixty three days, 3 bucks per treatment were starved for about 12 hours prior to slaughter but were given water. Slaughtered, were then bled and eviscerated and dressed for carcass indices evaluation. The carcass yield parameters determined were slaughter weight, dressed weight, dressing percentage and meat:bone ratio

The dressing percentage was calculated using the formular:

$$\text{Dressing percentage} = \frac{\text{Dressed weight}}{\text{Live weight}} \times 100$$

The animal was weighed before slaughter, the weight was noted.

The meat :bone ratiio was determined by clearly separating the flesh or the carcass from the bones.

The flesh was assembled and weighed and the weight was recorded. The weight of the flesh was divided by the weight of the bones.

**Table 1 Composition of Experimental Diet**

| Feed ingredients | Value (%) |
|---|---|
| Bambara nut offal | 15.00 |
| Beans offal meal | 1.50 |
| Cassava offal meal | 4.50 |
| Sweet potato peel meal | 3.00 |
| Maize offal | 56.00 |
| Yam peel meal | 10.25 |
| Full fat soya bean meal | 5.00 |
| Egg shell meal | 1.00 |
| Wood Ash | 0.75 |
| Table salt | 2.00 |
| Total | 100.00 |
| ***Calculated nutrient content:*** | |
| Crude protein | 16.15 |
| Crude fibre | 11.30 |
| Metabolizable energy (Kcal/kg diet) | 2,700 |

**Chemical Analysis**

Samples of the Neem leaves and the concentrate diet were analyzed for their proximate composition using the method outlined by AOAC (2000).

**Experimental Design and Statistical Analysis:**

The experimental Design was Completely Randomized Design (CRD). Data obtained was analyzed using a one-way Analysis of variance (ANOVA), means with significant differences were separated using Least Significant Differences (LSD) with the aids of Statistical Package identified as SAS, 9.04 , 2018 edition.

## 3 RESULTS AND DISCUSSION

### 3.1 Proximate Composition of Neem (*Azadirachta indica*) Leaves and Concentrate Diet

The proximate composition of neem leaves and concentrate diet is summarized in Table 2.

The protein content of 6.44-9.19% for the neem leaves were lower than 18.76 % reported by Fasae *et al* (2018) the values were also lower 12-18% recommended for growing ruminants in the tropics (NRC 1996). However, the supplement may take care of this deficiency, while the protein content of the concentrate diet (16.80%) was within the values of 12.18% recommended by NRC (1996). The crude fibre content of 9.5% for the supplement diet and 18.00% to 23.80% for the neem leaves were adequate for the goats (Lakpini *et al*., 2002). The ether extract values of 3.00% -4.80 % for the Neem leaves were within recommended values for ruminants while that of the concentrate diet fell within the range of 5-6% which if exceeded may reduce appetite and fibre digestion (Maithison *et al*., 1997). The ash value range of 8.00 % - 14.0 % was higher than 11.67 % reported by Fasae *et al* (2018)

**Table 2:Proximate Composition of Experimental Diets**

| Nutrient | Treatments | | | | |
|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Conc |
| Crude protein | 9.19 | 8.55 | 6.44 | 7.88 | 16.80 |
| Crude fiber | 18.50 | 19.30 | 18.00 | 23.80 | 9.50 |
| Ash | 11.50 | 11.80 | 8.00 | 14.50 | 3.15 |
| Ether extract | 3.60 | 3.70 | 3.00 | 4.80 | 5.85 |
| Moisture | 34.00 | 15.00 | 40.50 | 10.00 | 5.05 |
| Dry matter | 64.00 | 85.00 | 59.50 | 90.00 | 94.95 |
| NFE | 23.20 | 41.65 | 22.76 | 41.02 | 60.65 |
| Neutral Detergent Fibre | 54.00 | 55.00 | 54.55 | 52.35 | 60.00 |
| Acid Detergent Fibre | 37.40 | 36.30 | 37.00 | 40.15 | 34.50 |
| Acid Detergent Lignin | 8.60 | 8.70 | 8.45 | 7.50 | 5.50 |
| Ceellulose | 28.80 | 27.60 | 28.55 | 32.65 | 29.00 |
| Hemicellulose | 16.60 | 18.70 | 16.45 | 12.20 | 25.50 |

Conc.=Concentrate, NFE=Nitrogen Free Extract

**Carcass Yield of Red Sokoto Goat Fed Different Forms of Neem (*Azandirachta indica*) leaves and a Concentrate Diet.**

The carcass yield of red sokoto goats is summarized in table 4, the slaughter weight and meat – bone ratio were significantly ($p<0.05$) different. The dressing percentage range from 46.24- 58.96. The dressing percentage in this study were higher than the range of 43.80 – 47.30 reported by Ukanwoko *et al*., (2009) when they fed west African dwarf goats with cassava leaf meal –meal base diets. The higher dressing percentage in this study may be due to the inclusion of the gut, head. Legs and internal organs in the dressed carcass. Cassey and Van Nickrek (1988) had reported that dressing percentage can be influenced by many factors such as fleece and hide weight alimentary tract size and fill as well. Slaughtering procedure and portioning of body fat, also the dressing method can affect the dressing percentage because parts which are considered as offal in some dressing method may not be considered offal in some dressing methods. Ocheja *et al.,* (2016) and Odoemedem *et al*., (2014) recorded significant ($p<0.05$) difference in the values for carcass yield with west African dwarf goats fed bamboo leaves and cashew nut shell base supplement diets and *Panicum maximum* and Bambara nut meal base concentrate diets respectively.

**Table 3: Carcass Yield Data**

| Parameter | Treatments | | | | |
|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | SEM |
| Slaughter weight (kg) | 6.40 | 6.40 | 6.23 | 6.27 | 0.39 |
| Dressed weight (%) | 4.50[a] | 4.00[b] | 4.03[b] | 3.97[b] | 0.09 |
| Dressing percentage (%) | 58.96[a] | 54.82[a] | 53.21[a] | 46.24[b] | 2.72 |
| Meat-bone ratio | 2.14 | 2.07 | 1.96 | 2.10 | 0.14 |

a b c;Means within row with different superscripts are significantly different (P<0.05),

SEM= standard error of mean

## 4.0 CONCLUSION AND RECOMMENDATIONS

### 4.1 Conclusion

The different forms of neem leaves and the concentrate diet have adequate array of nutrients to sustain The goats during the long dry season.

Treatment (1) fed with fresh neem leaves produced the best array of Carcass yield parameters

### 4.2 Recommendations

Further research using other breeds , classes and breeds of ruminants such as sheep and cattle is recommended

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