WEIGHTS OF BY-PRODUCTS OF CARCASS OF YANKASA RAMS FED *Panicum maximum* SUPPLEMENTED WITH BAMBARA NUT OFFAL AND RICE OFFAL BASED CONCENTRATE DIETS.

[1]Ocheja,J .O, [1]Sadiq,M.S[1]Umar,[1]M.M,[1]Umar, H.A, [2]Madu, I, [2]Yakubu, M.K, [1]Abdulrahman, A.Y and [3]Omada, J.U

[1]Department of Animal Science , Federal University, Kashere ,Gombe State, Nigeria

[2] Department of Animal Health and Production Technology,Federal College of Horticulture, DadinKowa, Gombe State, Nigeria

[3]Department of Animal Production, Kogi State University , Anyigba, Nigeria

(Ocheja,J.O : josiahocheja@yahoo.co.uk)

ABSTRACT

The study evaluated the weights of some by-products of the carcass of Yankasa rams fed Panicum maximum as well as bambara nut offal and cereal spent grains based supplement diets. Twelve Yankasa rams **,**aged about 12 months old *were allotted into four (4) treatments of three rams each. The rams were fed Panicum maximum at 250g/rams/day and a concentrate supplement diet at 150g per/ram/day for each of the treatments for a duration of Nine weeks (63 days). Known volume of water was served , feed and water intake were monitored and recorded The experimental design was a complete randomized design ,data were analysed using a one-way analysis of variance and least significant difference to separate the significant means using SAS, 2009 statistical package , .Concentrate and browse samples were analysed using the methods of AOAC (2000). Daily forage intake , daily supplement intake , total daily feed intake and water intake values were all not significantly ($p<0.05$) different across the treatment means. All the by-product weights determined were not significant ($P>0.05$),except the full gut (30.00 to 35.50%) which was significantly ($P>0.05$)different. It was therefore concluded that Panicum maximum and the supplement diets had no influence on the weights of by-products of Yankasa rams.Further research using other breeds and classes of rams was recommended.*

Keywords: By-Products, FeedIntake ,Skin, Supplement, Yankasa rams.

INTRODUCTION

The down turn in the Nigerian economy with its attendant high unemployment rate and high poverty level calls for redoubling of efforts in the search for other revenue sources for the Government, families and individuals (Abalaka *et al* 2021;Ocheja *et al*, 2019; Odoma,2017). One of the ways of getting this done is to harness the by-products of livestock that hitherto were considered as useless materials and therefore discarded, as well as paying more attention to some of the by-products that attracted little attention before now. Some of these by-products include , horns, hooves, skin, fat, hair, stomach/rumen contents, feathers, bones, blood, egg shell, etc, from cattle ,sheep, goats, rabbits, swine, poultry and even from fish and wild life. These by-products can now be put to good use by collecting them for use locally, sale locally , for processing and value addition as well as export (Ocheja *et al*,2019)

Ocheja *et al* (2019) reported the weights of abdominal fat to range from 0.17 – 0.24,%, hooves ,(0.18 – 0.20%), blood weight(2.91 – 3.10%) gut content (17.09 – 19.91%) for West African dwarf goats fed bamboo leaves and cashew nut shell based diets.

Steele (1996) reported that the weight /value of goat skin represents 8% of the total weight/value of the goat. By-products of sheep carcass include blood, wool , pelt , skin, horns. hooves , rumen/ gut contents (Gatenby 2002)

From the forgoing it is expedient to determine the weighs of the by- products of the carcass of ruminant animals , with a view to encouraging their Processing , value addition, use in the manufacturing industries and export so as to help in diversifying the revenue base of the Nigerian economy and help provide employment opportunities. Further more there is dearth of research data on the evaluation of the by-products of sheep (rams), few available data in ruminants are on goats (Abalaka *et al* , 2021;Ocheja *et al* ,2019 ; Odoma,2017) thus making this research work quite justifiable.

The aim of this work therefore was to assess the weights of some by-products of carcass of Yankasa rams fed ,*Panicum maximum* supplemented with Bambara nut offal and cereal spent grains based concentrate diets.

2.0 MATERIALS AND METHODS

2.1 Experimental Location: The experiment was conducted at the Small Ruminant unit of the Livestock Teaching and Research farm, Kogi State University, Anyigba, located in the derived Guinea Savannah zone of Nigeria on latitude $7^0 15^{`}$ and $7^0 29^{`}$ N of the equator and longitudes $7^0 11'$ and $7^0 32'$E of the Greenwich meridian. The zone lies in the warm humid climate of the tropics with distinct wet and dry seasons in April to October and November to March respectively. Annual rainfall ranges from 1400-1500mm with an ambient temperature of about 25^0C with the highest in March and April (Kowal and Knabe 1972). The average altitude is 420 meters above sea level (Ifatimehin *and* Ufuah 2006).

2.2 Feed preparation, Experimental Animals, and Management

Twelve (12) Yankasa rams,aged about 12 months old were used for the study. The animals were housed individually and treated with Ivomec, for endo and ecto parasite control at 0.3ml each and oxytetracycline, hydrochloric and procaine penicillin at 3.0ml each as prophylactic treatment to provide a good and common health status. The *Panicum maximum* used for the study was obtained from within Kogi State University Campus,Anyigba, wilted for 24hours to reduce the moisture content before feeding The supplement components were Bambara nut offal (BNO),rice offals (RO), bone meal (BM), and Table salt .The rams were allotted in a Completely Randomized Design (CRD) into four (4) treatments. Each treatment had 3 rams. Each ram was fed 150g of the supplement diet per day**.**

The grass was wilted for 24 hours and fed at 250g /goat/dayfor each treatment, the concentrate was fed 1 hour later

Feed served the rams was weighed daily and the left over was also weighed and subtracted from the quantity of feed served to determine the feed intake. Known volume of water was served and the water intake of the rams recorded. The study duration was Nine weeks (63days),after a preliminary feeding period of 7 days.

Table 1: Composition of Supplement Diets (% Dry matter)

Ingredients	**Composition/Treatments**			
	T_1	T_2	T_3	T_4
Bambara Nut Offal	64.00	48.00	32.00	30.00
Rice Offal	32.00	48.00	64.00	66.00
Table salt	1.00	1.00	1.00	1.00
Bone meal	3.00	3.00	3.00	3.00
Total	100	100	100	100
Calculated nutrient content (% DM)				
Crude protein	18.10	17.80	17.45	17.40
Crude fibre	16.30	17.10	17.50	17.90
ME (Kcal/kgDM)	2800	2785	2740	1720

2.3 By-products Weights Determination

On the last day of the feeding trial the ramswere starved for 12 hours , but were given water, they were then slaughtered , bled, eviscerated and dressed .the horns, hooves , rumen content, full gut, and skin were removed, the blood of each slaughtered ram was collected in a container, they were all weighed and their weights converted to percentage of slaughter weights

2.4Proximate Chemical Analysis; Samples of *Panicum maximum* and the supplement diets were analyzed for their proximate composition using standard procedure according to the methods of AOAC (2000)

2.5 Experimental design and Statistical Analysis

The experimental design was a completely randomized design (CRD). Data were analysed using a one-way analysis of variance (ANOVA) and treatment means with significant differences were separated using least significant difference (LSD) with the aid of SAS, 2009 Statistical Package

3.0 RESULTS AND DISCUSSION

3.1 Proximate Composition of *Panicum maximum* and the Concentrate Diets

The proximate composition of the grass and concentratediets are summarized in Table 2.

The protein content of the concentrate diets of about 18% fell within the values of 12-18% recommended for growing ruminants in the tropics while that of the grass fell below the recommended values . (NRC, 1996), but was also above the critical value of 8% required to provide adequate ammonia for normal rumen functions (Lakpini, 2002).The fibre and energy of the supplement were within recommended values for rams (Lakpini *et al,* 2002). The energy value of the grass was below recommended values for rams ,but compensated for by the supplement.

Table 2: Proximate Composition of *Panicum maximum* and supplement diets (%DM)

Nutrients	Treatment				
	T_1	T_2	T_3	T_4	Panicum maximum
Crude Protein	18.40	18.00	17.80	17.64	10.85
Crude Fibre	8.50	8.70	8.76	8.90	21.60
Nitrogen Free Extracts	57.30	57.60	57.40	58.20	45.00
Ether Extracts	6.50	6.70	6.15	6.25	4.50
Ash	6.55	6.60	6.70	5.65	14.60

3.2 Feed Intake and Water Intake of Experimental Animals

The feed and water intake records of the experimental Yankasa rams is presented in Table 3.

The values for daily supplement intake,(141.30 – 145.33g),daily forage intake(240.90 – 245.50g) and total actual daily feed intake(385.50 – 389.90g) were all not significant($P<0.05$),the values for total feed intake were higher than 253 - 407 g reported by anyanwu *et al* (2011)for West African dwarf sheep fed browse from 3 multipurpose tree species, but much lower than 920 – 931.65 g reported by Ocheja *et al* (2011) for Yankasa rams fed Panicum maximum and a concentrate diet , and about 597.50 g reported by Arigbede *et al* (2011) for West African dwarf rams fed graded levels of molasses and *Enterolobium cyclocarpium* seeds based concentrates as supplement to *Panicum maximum,* these disparities could be due to differences in the seasons in which the experiments were conducted, breeds and the composition of the concentrate diets . The Water intake (380.00 – 390.0 ml) showed no significant ($p>0.05$) difference , the water intake values followed the pattern of the dry matter intake, this could also mean that the supplement diets/composition did not influence the water intake

Table 3: Feed Intake Records of the Experimental Yankasa Rams

Parameters	Treatments				SEM
	T_1	T_2	T_3	T_4	
Daily Supplement Intake (g)	144.40	141.30	145.33	142.60	3.86
Daily Forage Intake (g)	245.50	244.20	240.90	245.30	3.38
Total Daily Feed Intake (g)	389.90	385.50	396.23	387.90	2.55
Water intake (ml)	380.00	386.90	385.50	390.00	5.40

SEM Standard Error of Means

3.3: Weights of By-Products of the Experimental Yankasa Rams

All the by-product weights determined were not significantly ($P>0.05$) different, except the full gut values (30.00 to 35.50%) which showed significant ($P< 0.05$) difference, this could however not be explained. all the values also did not follow a definite trend. This result was almost at par with that obtained by Abalaka *et al* ,(2021) who reported non significance in the weights of all the by-products evaluated for West African dwarf goats fed Panicum maximum supplemented with Bambara nut and rice offal based supplement diets and Ocheja *et.al*., (2019), who recorded non significant($P<0.05$) differences in all the by-products evaluated except abdominal fat , when they fed Bamboo leaves and supplement diets containing graded levels of cashew nut shell to West African dwarf goats. However, Ozung and Anya (2018), reported significant($P<0.05$) values in the weights of some internal organs and by-products when they fed West African dwarf goats with cassava peels meal based diets with African yam bean concentrate. Odoemedem *et. al*.,(2014), also obtained significant ($P<0.05$) differences in the weights of the internal organs and some by-products in West African dwarf bucks fed *Panicum maximum* supplemented concentrate containing bambara nut meal. The observed differences could be attributed to differences in the concentrates and forages fed to the goats.

Table 4: Weights of By-Products (%of Slaughter Weight) of The Carcass of Yankasa Rams Fed *Panicum maximum* and a supplement Diet

By-Products	Treatments				
	T_1	T_2	T_3	T_4	SEM
Skin	8.10	8.30	8.05	8.55	1.00
Full Gut	30.00[a]	34.70[a]	34.40[a]	35.50[a]	1.01
Hooves	0.25	0.24	0.21	0.23	0.15
Horns	0.18	0.17	0.18	0.19	0.20
Blood	3.85	3.90	3.80	3.70	0.66
Rumen Content	14.65	14.90	15.15	15.20	0.39

a, b,=Treatment means on the same row with different superscripts differ significantly (p>0.05).
SEM= Standard Error of the Means.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1Conclusion

Panicum maximum as well as bambara nut offal and cereal spent grain based supplement diets did not influence the weights of the by-products of Yankasa rams. Bambara nut offal and rice offal based concentrate diets are suitable for feeding Yankasa rams especially during the long dry season.

4.2 Recommendations

Feeding and management practices should be developed and tailored towards the production of some of these by-products but without compromising the meat yield. Further research should be carried out using other breeds of sheep.

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