EFFECTS OF FEEDING SIGNAL GRASS *(Brachiaria decumbens)* AS A BASAL DIET WITH DIFFERENTSUPPLEMENTAL PROTEIN SOURCES ON CARCASS CHARACTERISTICS OF *BALAMI* RAMS

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ABSTRACT

The research work was conducted at The Federal Polytechnic Bauchi Livestock Teaching and Research farrm where eight (8) rams were used to evaluate the carcass characteristics of the experimental animals after feeding trial. Results showed that fasted live weights were significantly ($p<0.05$) different between the treatments ranging from 24.60 kg as the least value for the control (D) to 26.84 kg for diet C that recorded the highest. The liver weight was significantly ($P<0.05$) affected by the supplemental protein sources ranging from least value of 572 g (D) which is a control to the highest mean value of 639 g (C). The Empty body weight showed no significant ($p >0.05$) difference among the experimental rams ranging from 20.95 kg as the mean least weight in treatment D to the highest mean value of 21.95 kg (C). The dressing percentage of the experimental rams showed significant ($P<0.05$) difference across the treatments. Animals fed diet D had the least dressing percentage (44.98%) while treatment C had highest mean value of 52.17%.Conclusively, most of carcass characteristics were significantly affected by the variation of supplemental protein sources in growing Balami rams when fed *Brachiaria decumbens* as a basal diet.

Key Words: Fasted live weight, Rams, Carcass, *Balami* and Liver weight

INTRODUCTION

It is indisputable that sheep and goats, are increasingly becoming a vital source of animal protein in Nigeria, contributing over 35 % of total meat consumption in Nigeria (Mohammed, 2019). The figure can be higher, if animals not processed in slaughter houses, for which records are not available are included (Mohammed, 2019).In Nigeria, sheep and goats play a significant socio-economic role in the life of the people: they are slaughtered during ceremonies and festivals, and serve as a source of ready cash to small farmers. Fattening of rams in a feedlot is one of the best options of increasing animal protein supply. Good feeding advances average daily gain and feed efficiency as protein and energy levels in the diet are increased (Ebrahimi *et al*., 2007). Ram fattening is done to increase carcass yield by 30-40% during a short period on a high level of nutrition which is usually made up of high energy concentrates (Iwuanyanwu, 2001). The population of sheep in Nigeria is currently estimated at 33.4 million making up 3.1% of the world's livestock (FAOSTAT, 2011). Uda and the Balami breeds are widely distributed within the arid and semi-arid regions of the country. Studies on the productivity of indigenous breeds under improved conditions can be helpful for better evaluation of their potentialities as different breeds react differently to feed. Meat production is based on the growth production of the animal which depends on environmental factors and management practices (Akinleye *et al*., 2019). Carcass composition of various breeds differs considerably in terms of carcass weight, percentages of fat, muscle and bone (Islam *et al*., 2019). This research work aimed to find out the effect of different supplemental protein sources (Cottonseed Cake, Poultry litter and *Moringa oleifera*) weight gain and carcass characteristics of fattened Balami Rams fed *Brachiaria decumbens* as basal diet.

MATERIALS AND METHODS

Feeding trial was conducted for seventy days then followed by evaluation of carcass characteristics. Composition of the supplementary diets is shown in Table 1. The diets containing CSC + MO is

treatment A one containing PL + MO is treatment B, that of C treatment was made up of MRL + MO while D served as control with MO only.

Table 1: Gross Composition of the Supplementary Diets

Ingredients	**Treatments**			
	A	**B**	**C**	**D**
MO	100	100	100	100
CSC	200	00	00	00
PL	00	200	00	00
MRL	00	00	200	00
Total	**300g**	**300g**	**300g**	**100g**

MO=Maize offal, CSC= Cottonseed cake, MRL= *Moringa olifera* leaves, PL= Poultry litter

At the end of the fattening period of seventy days, two animals per treatment were randomly selected for carcass evaluation. The carcasses were evaluated according to method of Ahmaefule and Udo (2010). The animals were slaughtered in the morning after twelve hours of fasting except water. The animals were weighed before slaughter and after complete bleeding the head was removed at the atlanto-ocipital joint. The rams were skinned, visceral organs were removed, and the hot carcasses weights were immediately recorded. The head, four feet, skin, heart, lungs and trachea, liver, spleen, were separated and weighed. The alimentary tract was weighed full, then emptied and re-weighed and the gut "fill" weight was determined by difference. The empty body weight (EBW) was calculated by subtracting the gut fill from the slaughter weight. Dressing percentage was determined by the following formular.

$$\text{Dressing \%} = \frac{\text{Carcass weight}}{\text{Live weight}} \times 100$$

Statistical analysis

The data generated were subjected to statistical analysis of diet for variance using General Linear Model in Statistical Analysis System (SAS, 1998). Where significant differences existed means were separated using Least Significance Difference (LSD) as outlined by Steel and Torrie (1980).

RESULTS AND DISCUSSION

The effects of supplementing rams with different protein sources on carcass characteristics of rams is shown in Table 2. The result showed that fasted live weight of the animals were significantly ($p<0.05$) different between the treatments. The least value of 24.60 kg was recorded for the control (D) while animals' supplemented diet C recorded the highest weight of 26.84 kg. While Bled weight recorded least value of 23.30 kg in treatment D and treatment C as the highest value (25.35 kg).This is higher than 11.84 to 15.92 kg and 11.42 to 15.10 kg for fasted and bled weight respectively reported by John (2015). The fasted weight is also higher than 17.83 to 20.33 kg reported by Fasae *et al.* (2014) when assessing Yankasa and West African Dwarf sheep, but lower than 36.67 to 45.57 kg reported by Shumuye and Yayneshet (2016) when Abergelle goats were fed with Acacia. This could be due to variation in species, breed, age and diets of the experiments. The Empty body weight showed no significant ($p >0.05$) difference among the experimental rams with 20.95 kg as the mean least weight in treatment D to the highest mean value of 21.95 kg in treatment C. This is higher than 11.94 to 13.54 kg reported byTibin *et al.* (2012) when the authors fed Desert sheep under range condition. The variation might be due to different species, age and individual differences.

Warm carcass weight of 11.05 kg (D) was recorded as the least while the highest value of 14.00 kg was recorded in treatment C. The range fall within 10.3 to 12.30 kg obtained by Fasae *et al.* (2014) when assessing Yankasa and West African Dwarf sheep, but lower than 15.83 to 22.67 kg reported by Tibin *et al.*(2012) when the authors fed Desert sheep under range condition. The variation could be due to differences in breed and feed ingredients. The dressing percentage of the experimental rams showed significant ($P<0.05$) difference across the treatments. The animals fed diet D had the least dressing percentage of 44.98% while the highest mean value of 52.17% was recorded for animals supplemented diet C. This result fall within the range of 45.82 to 50.30 kg reported by Tibin *et al.* (2012) after feeding Desert sheep under range condition. The legs of the animals were statistically

(P<0.05) different across the treatments as a result of supplementing different protein sources. The least value (1.14 kg) was obtained in treatment D treatment while treatment A had the highest value of 1.26 kg. This is lower than 2.07 to 2.38 kg reported by Urbano *et al.* (2012) when the authors fed sheep with Castro bean haulm, but higher than 0.499 kg to 0.577 kg reported by John (2015) as result of feeding Red Sokoto bucks with different supplements. The heads of the ram were statistically (P>0.05) similar between treatments as a result of supplementing different protein sources. The reproductive organ (full) showed variations (P<0.05) between the treatments with the least value (220 g) obtained in treatment C while the highest mean value of 279.5 g obtained in treatment B. The result is higher than 162.2 g reported by Tibin *et al.* (2012). Similarly, the testis weights were significantly (P<0.05) different between the treatments; with the least mean value of 137 g obtained in D while the highest testis weight obtained in treatment C (264 g).

The gut (full) of the rams was significantly (P<0.05) different between the treatments. Treatment D had the least value of 4.60 g while animals supplemented diet C gave a highest gut value of 5.72 kg more than those fed other protein sources. The empty gut weight showing no significant (P>0.05) difference across the experimental treatments. Rams fed diet C recorded the least value of 2.32 kg while animals fed diet A recorded the highest value of 2.40 kg. The heart weight was not significantly (P>0.05) affected as a result of supplementing different protein sources, but treatment A recorded the least heart weight of 152 g and animals in treatment B recorded higher mean value of 193 g. This is in agreement with the average heart weight of sheep (148.5g) reported by Mamdouh (2014) when the author compared the carcass characteristics of sheep and goats. There was significant (P<0.05) differences between the treatments on weight of the Lungs where treatment D (control) recorded the least lung weight with a value of 323 g while the highest mean value obtained in treatment B (387 g). The value is not in agreement with 274.5 to 510.0g as obtained by Mamdouh (2014) when the author compared the carcass characteristics of sheep and goats, where the variation could be due to differences of breeds and species.

Table 2: Carcass characteristics of Balami rams fattened with different supplemental protein sources fed *Brachiaria decumbens* as basal diet

Parameters	**Treatments**				
	A	**B**	**C**	**D**	**LSD**
Fasted live weight (kg)	26.11^{ab}	25.30^{ab}	26.82^{a}	24.60^{b}	1.969
Bled weight (kg)	24.71^{ab}	24.20^{bc}	25.35^{a}	23.20^{c}	1.096
Empty body weight (kg)	21.89	21.20	21.95	20.95	1.046
Warm carcass weight (kg)	12.56^{b}	12.39.^{b}	14.00^{a}	11.05^{c}	1.124
Dressing percentage	47.94^{b}	48.97^{ab}	52.17^{a}	44.98^{b}	4.862
Leg or shank (kg)	1.26^{a}	1.02^{d}	1.21^{b}	1.14c	0.002
Head (kg)	2.18	2.14	2.14	2.80	0.472
Testis (g)	110^{c}	128^{b}	264^{a}	137^{b}	16.540
Full gut (kg)	5.22^{a}	5.35^{a}	5.72^{a}	4.60^{b}	10.511
Empty gut (kg)	2.40	2.35	2.32	2.35	0.775
Heart (g)	152	193	184	160	82.536
Lungs (g)	350^{ab}	387^{a}	351^{ab}	323^{b}	54.786
Liver (g)	590^{bc}	604^{b}	639^{a}	572^{c}	23.308
Spleen (g)	70	74.4	72.24	74.12	17.143
Kidney (g)	160^{ab}	156^{b}	188^{ab}	204^{a}	43.407
Skin (kg)	1.74	1.70	1.40	2.10	0.856

Means in the same row with different superscript (a, b and c) are significantly different (P<0.05), LSD= Least significant difference

The weight of the liver was significantly (P<0.05) affected by the protein sources with the least value of 572 g obtained in treatment D (control) and the highest mean value of 639 g for animals on treatment C. The highest weight is slightly in agreement with the average liver weight of 652.0 g reported by Mamdouh (2014) when the author compared the carcass characteristics of sheep and goats. Also, the weight of the spleen mean values were statistically similar (P>0.05) across the treatments with the least and highest spleen weights obtained in treatments A (70 g) and B (74.4 g)

respectively which is higher than 47.5 g obtained by Mamdouh (2014) when the author compared the carcass characteristics of sheep and goats, and the variation could be due to differences of breeds.
The mean weight of the Kidneys were significantly ($P<0.05$) different among the treatments. The least value of 156 g recorded for animals on diet C and the highest value obtained in treatment D (204 g). The weight of the skin was similar ($P>0.05$) across the treatments with the least value of 1.70 kg recorded in treatment B while the highest value of 2.10 kg was obtained in the treatment D (control).

CONCLUSION AND RECOMMENDATION

From the analysis, the variation in terms of supplemental protein sources used in the experiment had effects on carcass characteristics when basal diet of Signal grass (*Brachiaria decumbens*) hay was fed to *Balami* rams *adlibitum.* Further research should focus on the effect of different protein supplement on carcass characteristics on other local breeds of sheep.

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