CARCASS CHARACTERISTICS AND YIELDS OF YEARLING YANKASA RAMS FED SORGHUM STOVER SUPPLEMENTED WITH DIFFERENT LEVELS OF DRIED POULTRY DROPPINGS BASED DIETS

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Abstract: This research was conducted to study the carcass characteristics and yields of yearling Yankasa rams fed sorghum stover supplemented with different levels of dried poultry droppings based diets. 15 yearling Yankasa rams, weighing 11.5-15.5 kg were randomly allotted into five treatment groups designated T_1, T_2, T_3, T_4 and T_5 consisting of three replicates with one animal per replicate. Chopped sorghum Stover was offered across the treatment groups' *ad libitum* and dried poultry droppings based diet was offered at 2% of body weight with 0%, 20%, 40%, 60% and 80% inclusion levels. Results showed that T_1 recorded significantly (P>0.05) lowest live weight compared to other treatment groups. Similarly, carcass weight of unsupplemented treatment group (T_1) was significantly (P>0.05) lower compared to the other supplemented treatment groups. There was no (P>0.05) differences among the treatment groups in Dressing percentages. However, T_2 had the highest values compared to other treatment groups. Distribution of the slaughtered parts followed the same trend as was observed for live weight and carcass weight. It was therefore concluded that supplementation of sorghum stover with dried poultry dropping based diets favors increase in carcass characteristics and yields.

Keywords: Carcass weight, dried poultry droppings, Sorghum stover, Yields, Yearling Yankasa rams.

Introduction: Yankasa Sheep are widespread in Northern part of Nigeria. They are numerically large in Nigeria. They make up about 60% of the Sheep population [18]. [2] Described it as the intermediate in size between the West African Dwarf Sheep (WAD) and the long-legged Uda. Mature live weights ranges from 30-45 kg in rams and 25-40 kg in ewes. Primarily Sheep are reared for meat production. Their contribution to total meat supply in the country is about 11% [2]. They are widely accepted throughout the country because there is no religious or cultural taboo forbidden its consumption by any segment of the country. Sheep meat (Mutton) is highly sought for during festivities like the Eid- ul - Adha by the Muslim faithful.

In an effort to remove the competition between Man and animal for the insufficient and unavailable food grains as food for Man and feed for animal as well to cut cost of production, the use of unpopular energy and protein materials of farm and agro-industrial wastes has gained more attention. Sorghum stover and poultry litter are some of the unpopular feedstuffs fed to livestock. Animal nutritionist in Nigeria has investigated the usage of these novel feedstuffs [11] [8] [20] [15] [1] [19] [9].

The above authors reported that Sorghum stover can be fed as a basal diet while poultry litter can be fed as a sole supplement which results in increase in weight gain, it can support ruminant's maintenance and as well as production needs especially when fed with suitable more energy source hence a promising feed for ruminant animals like Sheep [3] [9]. Above all, they reiterated further that it can lead to a reduction in feed cost hence has a great impact on the overall cost of livestock production.

However, there is little study on the effect of these novel feed combination on the carcass characteristics and yields on ruminant animal like Sheep. Therefore the objective of this study was to find out the effect of feeding sorghum stover supplemented with different levels of dried poultry droppings based diet on the carcass characteristics and yields of Yearling Yankasa rams.

Materials and Methods:

Location of Experimental Site: Experimental Location: The research was done at the Departmental Research Farm, Goat and Sheep unit of the School of Agriculture and Agricultural Technology, Federal University of Technology, Minna. It is located around the Southern Guinea Savannah agro-ecological zone of the country [13]. Average highest temperature of 30.5^{o}C was recorded in the month of March and 22^{o}C lowest in August. The highest mean rainfall of 1400mm was recorded in the month of July and August. Humidity varies between 60% and 75% [10].

Experimental animals and their management: Fifteen Yankasa rams, weighing 11.5 – 15.5 kg was used for the study. The rams were housed in each pen. Wood shavings were provided as bedding materials for ram comfort. A prophylactic treatment measure was carried on the rams. The rams were thereafter assigned into five treatment groups and fed for 14 days pre-treatment period before data collection. Mineral lick block was supplied throughout the period of the experiment. And water was equally provided *ad-libitum*. Data on feed intake, weight gain were monitored. The rams were raised under

feedlots.

Experimental design: The rams were assigned in to five treatments (T_1-T_5) consisting of three replicates with one animal per replicate. Treatment one (T_1) were rams fed 0 % dried poultry droppings based diet (DPDBD), T_2 were fed with 20 % (DPDBD), T_3 were fed with 40 % (DPDBD), T_4 were fed with 60 %(DPDBD) and T_5 were fed with 80 % (DPDBD). Sorghum Stover was fed to the rams' *ad-libitum* across the treatment groups. The rams were Fed for 106 days.

Carcass evaluation: At the end of the experiment, the rams were slaughtered by cutting the jugular veins and carotid arteries of the neck region after fasting them overnight [17]. They were weighed individually before slaughter. Subsequent weights were taken after slaughter. Dressing percentage was calculated as the Eviscerated weight in relation to live weight before slaughter. After thorough bleeding, they were skinned and eviscerated; the carcasses were split into two halves longitudinally along the median plane of the vertebrae using a knife. These carcasses were then separated into wholesale cuts (hind leg, foreleg, breast, back, and neck) and weighed as described by [12], while other carcass by-products and organs were weighed also as described by [4].

Statistical analysis: All data obtained in this study were analyzed with analysis of variance using the general linear model procedure of SAS [21]. Means were separated using least significant difference test of the same package.

Results:

Chemical composition of supplementary diet (% DM Basis): The results of the proximate analysis and energy determination of supplementary diets (% DM Basis) are shown in Table 1. The dry matter levels of the supplementary diet ranged between 84.20 % in Treatment 1 to 92.80 % in Treatment 5. The crude protein in the supplementary diet varied from 7.00 % in Treatment 1 to 15.40 % in Treatment 5. The crude fibre levels ranged from 3.2 % in Treatment 1 to 12.50 % in Treatment 4.

Ash values of 5.50 %, 12.00 %, 12.50 %, 16.50 % and 25.00 % were recorded for Treatment 1 to 5. The values of ether extracts were lowest (5.00%) in T_1 and highest (17.50%) in T_5. Nitrogen free extract value varied between (26.90%) in Treatment 4 to (63.50) % in Treatment 1. The calculated gross energy ranged from 2.27kcal/g in Treatment 4 to 4.23kcal/g in Treatment 2.

The lowest value of the crude protein of the sorghum stover provides the reason for supplementation. This is in tandem with [25]. Higher level of crude fibre observed for poultry droppings and sorghum stover were as a result of the presence of wasted feed, feathers and egg-shell and the lignifications of the sorghum stover. The ash content values of poultry droppings reported in this study was lower than the values reported by [24]. The total energy value of sorghum stover in this study concurs with the result of [6]. Because of the lower value of sorghum stover energy level additional source of energy is required [3] [1].

The crude proteins of the supplementary diet in this study were within the range reported by [3] except T_1 which was below the range. The total energy contents of the supplementary diet followed the same pattern as for crude protein with the exception of T_1 all others were within the values recommended by [16].

Table 1: Proximate Composition (% DM Basis) of Supplementary Diets fed to Yearling Yankasa Rams

Composition	T_1	T_2	T_3	T_4	T_5
Dry matter	84.20	88.60	92.20	85.80	92.80
Crude protein	7.00	13.13	13.60	14.00	15.40
Crude fibre	3.20	6.70	9.30	12.50	8.00
Ash	5.50	12.00	12.50	16.50	25.00
Ether extract	5.00	20.00	12.50	12.50	17.50
Nitrogen free extract	63.50	36.77	44.30	30.30	26.9
Energy (kcal/g	2.27	2.53	2.81	3.90	4.23

Carcass characteristic and yields of Yearling Yankasa rams fed sorghum stover supplemented with different levels of dried poultry droppings based diet: Results showed that T_1 recorded ($P > 0.05$) lowest live weight compare to other treatment groups. Back, breast and flap, neck weight percentage, slaughter and eviscerated weight values shows that T_1 had ($P > 0.05$) lower value compared to other treatment groups. There was no ($P < 0.05$) difference among the treatment groups in dressing percentage. However, T_2 had the highest values compared to other treatment groups. T_1 recorded ($P > 0.05$) lowest values for fore leg weight and hind leg weight percentage. No significant ($P > 0.05$) difference

was observed among the treatment groups for per cent head, skin and tail weights. T_1 showed significant (P >0.05) lower values for rumen weight percentage than other treatment groups. There was no significant difference across the treatment group for per cent leg weight. Similarly, T_5 recorded significantly (P<0.05) higher per cent weight for oesophagus and drainable blood weight compare to other treatment groups. However, for abdominal fat weight percentage T_4 differs significantly (P<0.05) from other treatment groups. Result indicates that there were no significant (P>0.05) differences across the treatment groups for heart, lung and liver weight. No significant differences (P >0.05) were observed among the treatment group for kidney, spleen and testes weight percentage. T_4 recorded significantly (P<0.05) higher weight percentage for intestine compared to other treatment groups (Table 2).

Table 2: Carcass characteristics and yield of Yearling Yankasa ram fed sorghum Stover supplemented with different levels of dried poultry droppings based diet

A. Treatments

Parameters	T_1	T_2	T_3	T_4	T_5	LSD	LS
Carcass Yield							
Live weight (kg)	11.3^{b}	17.3^{a}	16.0^{a}	16.7^{a}	17.7^{a}	4.4	*
Slaughter weight (kg)	10.3^{b}	15.3^{a}	14.3^{ab}	14.7^{ab}	14.7^{ab}	4.9	*
Eviscerated weight (kg)	3.8^{b}	6.7^{a}	5.7^{ab}	5.8^{ab}	6.0^{a}	2.1	*
Dressing (%)	32.7	38.3	35.3	35.0	34.2	8.3	NS
Wholesale cuts expressed as percentage of live body weight							
Fore leg weight (%)	8.1^{ab}	8.7^{ab}	8.3^{ab}	9.1^{a}	7.8^{b}	1.0	*
Hind leg weight (%)	8.2^{b}	9.7^{a}	8.9^{ab}	8.9^{ab}	8.4^{ab}	1.2	*
Back weight (%)	5.3	7.2	5.5	5.9	6.0	2.2	NS
Breast & flap weight (%)	9.8^{b}	11.6^{a}	11.1^{ab}	10.7^{ab}	10.6^{ab}	1.3	*
Neck weight (%)	3.2	4.0	3.7	3.6	4.0	1.0	NS
Carcass by-product expressed as percentage of live body weight							
Head weight (%)	8.2	8.5	7.0	6.6	8.3	2.6	NS
Skin weight (%)	5.2	5.5	5.1	5.4	5.3	0.9	NS
Tail weight (%)	0.1	0.2	0.2	0.2	0.1	0.2	NS
Leg weight (%)	2.9	3.0	3.1	2.7	2.8	0.7	NS
Rumen weight (%)	3.4^{b}	3.1	3.7^{ab}	4.3^{a}	3.2^{b}	0.7	*
Oesophagus weight (%)	0.1^{b}	0.1^{b}	0.2^{ab}	0.1^{b}	0.3^{a}	0.1	*
Abdominal fat weight (%)	0.8	1.8	1.3	1.5	1.0	2.5	NS
Drainable blood weight (%)	1.0^{c}	2.0^{b}	1.7^{bc}	2.0^{b}	3.0^{a}	0.9	*
Organ expressed as percentage of live body weight							
Heart weight (%)	0.6	0.6	0.6	0.6	0.6	0.2	NS
Lungs weight (%)	1.0	1.3	1.3	1.3	1.4	0.6	NS
Liver weight (%)	1.3	1.4	1.4	1.5	1.3	0.4	NS
Kidney weight (%)	0.2	0.3	0.3	0.2	0.3	0.3	NS
Intestine weight (%)	4.2^{ab}	3.8^{b}	4.3^{ab}	5.0^{a}	4.3^{ab}	1.2	*
Spleen weight (%)	0.1	0.1	0.1	0.1	0.1	0.1	NS
Testes weight (%)	0.5	0.6	1.0	0.9	1.0	0.8	NS

abc: Mean values with the same letters along the row are not significantly different (P < 0.05) LS: Level of Significance, * = Significant difference (P<0.05), NS = not significant (P>0.05), LSD = Least significant difference

The higher live weight gain reported in this present study for treatment groups supplemented with different levels of dried poultry droppings based diet (DPDBD) concur with the earlier work of [14]. They reported that supplementation promoted body weight gain, dressing percentage and increased proportion of edible offal's. Similarly supplemented treatment groups had higher values for slaughter and Eviscerated weight. This was in agreement with the findings of [22][23][5], in their previous study on sheep and goat. They all observed higher values for all the parameters measured in favour of the supplemented treatment group compared to unsupplemented treatment group. The same trend was observed for internal organs. Higher values obtained in this study came from the treatment groups supplemented with DPDBD. This result is in conformity with the earlier work of [14] [7].

Conclusion: From the result of the present study, it was therefore concluded that supplementation of sorghum stover with dried poultry dropping based diets favors increase in carcass characteristics and yields of Yearling Yankasa rams.

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