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Research Article

Carcass Characteristics of Yankasa Ewes Fed Varying Levels of Dietary Premix

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Abstract

Twenty-five Yankasa ewes with average live weight of 10-15 kg and aged 6-7 months were used for the trial and they were randomly allocated to five (5) treatment groups comprising of five animals per treatment and with each animal as replicate. All animals were placed on 5 dietary treatments consisting of 5inclusions levels in a Complete Randomized Design. The experimental dietary premix formulated were 0 % as a control, 25 % LPP, 50 % LPP, 75 % LPP and 100 % LPP were used to determine which dietary premix will give the best or highest dietary needs and the inclusion levels. Dietary premix was administered to the animals with clean water ad-libitum in the morning, in a confined environment. The results revealed that live weight was significantly ($P<0.05$) different between T1, T3 and T4 and as well as between T2 and T5. However, T5 had the highest value. Significant ($P<0.05$) difference was observed between T1, T4 and T5 of the slaughter weight with T5 recording the highest value 31.31kg the dressed weight also significantly ($P<0.05$) differs between T1 and T5, with T5 maintaining the highest value. T1 and T3 of the Hot Dressed weight significantly ($P>0.05$) differ from T5. However, T5 had the highest value. There was no significant ($P>0.05$) difference observed in the dressing percent, head, skin, feet, full stomach, empty stomach, empty small intestine, large intestine, heart and kidney. Significant ($P<0.05$) difference was observed between T1, T2 and T4, T5 and between T2 and T3 of the Liver. However, T5 had the highest value of 0.41kg. Significant ($P<0.05$) difference was observed across treatment groups. The Lung was significantly ($P<0.05$) different across treatment groups. T1 was significantly ($P<0.05$) different from T2, T3, T4, and T5. T5 was however higher in value. Significant ($P<0.05$) difference was also observed in the Trachea across treatment groups. T2 was significantly different from T1, T3, T4 and T5. Significant ($P<0.05$) difference was observed in the Spleen with T1 having the highest value. T1, T2, T3 were significantly ($P<0.05$) different T4 and T5. The Tail was significantly ($P<0.05$) different across the treatments with T4 having the highest value of 0.29kg. The Bladder was however, not significantly ($P>0.05$) different across treatment groups but has T2 recording the highest value of 0.02kg. Carcass yield was increased with increasing level of supplementation while integrity of the relative organ's characteristics was maintained. The best result was obtained when Yankasa ewes fed dietary premix at 50-100 % levels of inclusion. It is therefore recommended that more feeding trials be conductedto ascertain the nutritive value and its suitability as feedstuff for small ruminants particularly during feed scarcity for improved performance and productivity.

Keywords: Carcass; Yankasa; Ewes; Premix; Abuja; Nigeria

Introduction

Small ruminants such as sheep and goats play important role in the livestock subsector of the Nigerian agricultural economy [1]. The small ruminant's skin has been estimated at 7,500 tonnes annually Food and Agricultural Organization [2]. The short generation interval of sheep coupled with high frequency of multiple birth allowed for rapid increases in animal numbers [3]. In Nigeria, small ruminants which represent about 63.7 % of total grazing domestic livestock are widely distributed in rural, urban and peri-urban areas. The vast majority of these small ruminants 70 % are found in the Northern part of the country. Sheep population in Nigeria, which is estimated to be 33.9 million, make sheep the second most important livestock species in the country [4]. The indigenous

breeds of sheep in order of importance are Yankasa 60 %, West African Dwarf 20 %, Uda 10 % and Balami 10 %. It is pertinent to use appropriate supplements and basal diets as a feeding strategy in order to balance the nutrient needs of the rumen microorganisms and the animals [5]. To achieve improved productivity in ruminants, several strategies have been advanced [3,6,7]. Another feeding strategy to achieve fattening objective is to develop a system of feeding with high energy and protein supplements [8]. It is the appreciation of this that gives rise to developing a locally prepared premix to substitute the industrial premix using concentrate and locally available ingredients. According to [9], increase body weight is highly correlated with feed consumption because dry matter intake is a key determinant of growth. An understanding of carcass analysis is imperative in accessing the quality of feed fed to animals among other things. Therefore, this experiment was conducted to improve the Carcass characteristics of Yankasa ewes fed dietary premix at varying levels of inclusion.

Materials and Methods

Experimental Location

The study was conducted at the Teaching and Research Farm of University of Abuja. Abuja is the capital city of Nigeria located in the centre of the country. At the 2006 census, the city of Abuja had a population of 776,298, making it one of the ten most populous cities in Nigeria. According to the United Nations, Abuja grew by 139.7 % between 2000 and 2010, making it the fastest growing city in the world. The latitude of Abuja, Federal Capital Territory (FCT) is 9.072264o, and the longitude is 7.491302o. Abuja is located at the cities place category with the Global Positioning System (GPS) coordinates of 9°4' 20.1504'' N and 7° 29' 28.6872'' E. and has elevation of 491 meters' height that are equal to 1,611 feet [10].

Experimental animals, diets and their management

A total number of twenty-five Yankasa ewes with average live weight of 10-15 kg and aged (six to seven) 6-7 months were used for the study. The animals were purchased from the local markets across the six Area Councils of Federal Capital Territory. Their ages were confirmed through dental identification. On arrival, the animals were quarantine for four weeks, during which period they were treated against ecto- parasites using Ivomec as a dewormer, with broad spectrum antihelmintic (albendazole) and also injectable antibiotic such as oxytetracycline to prevent infections. The entire sheep were vaccinated with Peste de Petis Ruminantes (PPR) vaccine injected intramuscularly. This is relevant to provide immunity against Peste de Petis Ruminantes (PPR) of sheep and goats. It will also provide healthier and disease- free flock for the study. The ewes were housed individually after quarantined, in concrete floored pens measuring 1.2 m2. The ewes were all tagged and screened to ensure they are pregnancy free. Stool and blood were also screened to confirm worm resistance. Feeding and watering troughs were provided; wood shavings were spread on the floor as litter which were change every two weeks. The selection of dietary premix of 0 % as a control, 25 % LPP, 50 % LPP, 75 % LPP and 100 % LPP were used to determine which dietary premix will give the best or highest dietary needs in terms of comparative between industrial and locally prepared premix. Dietary premix was administered to the animals with clean water adlibitum in the morning, in a confined environment.

Diet formulation

Basal and supplementary diet were used for the study. The basal diet consists of Dusa, BDG, Cassava peal, Cowpea husk and Salt. A total of (50 kg) 500g of the said ingredients were used to feed 25 ewes as basal diet per day. Supplementary diets we prepared into five types of feed, which include treatment one (T1) ewes fed no or 0 % dietary premix as control, T2 ewes fed with 75 % industrial premix (IP) and 25 % local prepared premix (LPP), T3 ewes fed with 50 % industrial premix (IP) and 50 % local prepared premix (LPP), T4 ewes fed with 25 % industrial premix (IP) and 75 % local prepared premix (LPP) and T5 ewes fed with 100 % local prepared premix (LPP).

Experimental design

Complete Randomized Design (CRD) was used for the study. Twenty-five Yankasa eweswere randomly allocated to five (5) treatment groups comprising of five animals per treatment and with each animal as replicate. All animals were placed on 5 dietary treatments consisting of 5 inclusion levels.

Data Collection

Carcass evaluations were carried out according to the procedure of Adu and Brinckman (1981) and Fasae et al. (2011). At the end of the experiment 2 ewes from each treatment were randomly selected from each treatment and fasted for 24 hours to determine their fasted weights. Slaughtering operation was conducted using local method by cutting the jugular veins and the carotid arteries at the atlanto- occipital articulation. The carcasses were properly bled after which cut into retail parts (shoulder, loin, legs, breast, neck, and flank) and each part were weighed. The hot carcass weight was determined after removing the head, feet and gastric intestinal tract (GIT).

Statistical analysis

All data generated in this study were subjected to analysis of Variance (ANOVA) using the General Linear Model (GLM) procedure of [11]. Means will be separated using Least Significant Difference (LSD) test of the same package.

Results And Discussion

The Carcass characteristics for Yankasa ewes fed varying levels of dietary premix mixture is presented Tables 1 & 2. The live weight was significantly ($P<0.05$) different between T1, T3 and T4 and as well as between T2 and T5. However, T5 had the highest value. Significant ($P<0.05$) difference was observed between T1, T4 and T5 of the slaughter weight with T5 recording the highest value 31.31kg the dressed weight also significantly ($P<0.05$) differs between T1 and T5 with T5 maintaining the highest value. T1 and T3 of the Hot

Dressed weight significantly (P>0.05) differ from T5. However, T5 had the highest value. There was no significant (P>0.05) difference observed in the dressing percent, head, skin, feet, full stomach, empty stomach, empty small intestine, large intestine, heart and kidney. Significant (P<0.05) difference was observed between T1, T2 and T4, T5 and also between T2 and T3 of the Liver. However, T5 had the highest value of 0.41kg. Significant (P<0.05) difference was observed across treatment groups The Lung was significantly (P<0.05) different across treatment groups. T1 was significantly (P<0.05) different from T2, T3, T4, and T5. T5 was however higher in value. Significant (P<0.05) difference was also observed in the Trachea across treatment groups. T2 was significantly different from T1, T3, T4 and T5. Significant (P<0.05) difference was observed in the Spleen with T1 having the highest value. T1, T2, T3 were significantly (P<0.05) different T4 and T5. The Tail was significantly (P<0.05) different across the treatments with T4 having the highest value of 0.29kg. The Bladder was however, not significantly (P>0.05) different across treatment groups but has T2 recording the highest value of 0.02kg.

The result of prime cuts for Yankasa ewes fed varying levels of dietary premix mixture on Table 3 shows that all parameters measured indicated significant (P<0.05) difference except for Arm. However, in the Leg, T1 significantly (P<0.05) differs from T3, T4and T5 while T2 differs from T4 and T5 with T4 having the highest value. The Chump does not significantly (P>0.05) differ between T1, T2 and T3 but significantly (P<0.05) differs between T4 and T5, with T5 having the highest value amongst treatment groups. The loin was observed to be significantly (P<0.05) different among treatment groups except for T1 and T3 that are not significantly (P>0.05) different. The Breast was significantly (P<0.05) different across treatment groups except for between T2 and T3 that were not significantly (P>0.05) different. There was no significant (P>0.05) difference between T1, T2, T3 and between T4 and T5 of the Neck.

Table 1: Gross composition of experimental diet (%DM).

Ingredients	T1	T2	T3	T4	T5
Premix	0	0.25	0.5	0.75	0.1
Molasses	25	25	25	25	25
Urea	1	1	1	1	1
Cotton Seed Cake	10	10	10	10	10
Groundnut cake	29	29	29	29	29
Wheat bran	15	15	15	15	15
Corn bran	20	20	20	20	20
Total	100	100	100	100	100

T1 where ewes fed no or 0 % dietary premix as control.

T2 where ewes fed with 75 % industrial premix (IP) and 25 % local prepared premix (LPP).

T3 where ewes fed with 50 % industrial premix (IP) and 50 % local prepared premix (LPP)

T4 where ewes fed with 25 % industrial premix (IP) and 75 % local prepared premix (LPP).

T5 where ewes fed with 100 % local prepared premix (LPP).

Table 2: Carcass characteristics of yankasa ewes fed dietary premix.

Parameter (kg)	T1	T2	T3	T4	T5	SEM	LOS
Live weight	21.00^{a}	26.65^{ab}	28.65^{bc}	32.70^{bc}	33.85^{c}	1.63	*
Slaughter weight	18.96^{a}	25.21^{ab}	25.35^{ab}	30.71^{b}	31.31^{b}	1.69	*
Dressed weight	13.65^{a}	20.63^{ab}	17.48^{ab}	20.43^{ab}	24.73^{b}	1.54	*
Hot dressed weight	9.65^{a}	14.30^{ab}	11.95^{a}	14.15^{ab}	17.55^{b}	0.99	*
Dressing percent	45.91	53.28	41.64	43.4	51.85	1.93	NS
Head	2.28	2.08	2.65	2.84	3.03	0.34	NS
Skin	2.02	1.71	2.23	3.54	3.87	0.44	NS
Feet	0.49	0.85	1.14	1.29	1.43	0.17	NS
Full Stomach	4.15	3.39	3.08	6.38	7.72	0.87	NS

Empty Stomach	0.58	0.55	1.17	1.77	1.68	0.21	NS
Empty S/Intestine	0.6	1.55	1.29	1.91	2.03	0.29	NS
Large Intestine	0.37	0.39	0.45	0.34	0.52	0.03	NS
Heart	0.17	0.17	0.22	0.13	0.17	0.01	NS
Kidney	0.12	0.07	0.08	0.09	0.53	0.09	NS
Liver	0.26^{ab}	0.22^{a}	0.32^{bc}	0.35^{cd}	0.41^{d}	0.02	*
Lungs	0.19^{a}	0.22^{b}	0.23^{b}	0.27^{c}	0.28^{c}	0.01	*
Trachea	0.04^{c}	0.02^{a}	0.03^{b}	0.04^{c}	0.04^{b}	0	*
Spleen	0.07^{b}	0.06^{b}	0.06^{b}	0.05^{a}	0.05^{a}	0	*
Tail	0.12^{a}	0.15^{b}	0.18^{c}	0.29^{e}	0.21^{d}	0.02	*
Bladder	0.02	0.03	0.02	0.02	0.01	0	NS

abcde ** Means in the same row with different superscripts differ significantly (P<0.05)

T1 where ewes fed no or 0 % dietary premix as control.

T2 where ewes fed with 75 % industrial premix (IP) and 25 % local prepared premix (LPP).

T3 where ewes fed with 50 % industrial premix (IP) and 50 % local prepared premix (LPP)

T4 where ewes fed with 25 % industrial premix (IP) and 75 % local prepared premix (LPP).

T5 where ewes fed with 100 % local prepared premix (LPP).

SEM: Standard Error of Mean.

LOS: Level of Significant.

Table 3: Prime Cuts of Yankasa Ewes Fed Premix Supplemented Diets.

Parameter (kg)	T1	T2	T3	T4	T5	SEM	LOS
Leg	0.89^{a}	0.98^{ab}	1.02^{b}	1.61^{c}	1.52^{c}	0.1	*
Chump	0.53^{a}	0.47^{a}	0.52^{a}	0.75^{b}	1.21^{c}	0.09	*
Loin	0.66^{b}	0.45^{a}	0.73^{b}	1.48^{d}	0.98^{c}	0.12	*
Breast	0.36^{a}	0.51^{b}	0.59^{b}	0.78^{c}	1.20^{d}	0.1	*
Neck	0.75^{ab}	0.59^{a}	0.82^{b}	1.25^{c}	1.16^{c}	0.08	*
Mid Rib	0.46^{a}	0.55^{a}	0.75^{b}	0.93^{b}	0.80^{b}	0.06	*
Main Rib	0.40^{a}	0.59^{ab}	0.73^{bc}	1.00^{d}	0.93^{cd}	0.08	*
Arm	1.32	0.84	0.93	1.43	1.43	0.11	NS

abcde ** Means in the same row with different superscripts differ significantly (P<0.05)

T1: where ewes fed no or 0 % dietary premix as control.

T2: where ewes fed with 75 % industrial premix (IP) and 25 % local prepared premix (LPP).

T3: where ewes fed with 50 % industrial premix (IP) and 50 % local prepared premix (LPP)

T4: where ewes fed with 25 % industrial premix (IP) and 75 % local prepared premix (LPP).

T5: where ewes fed with 100 % local prepared premix (LPP).

SEM: Standard Error of Mean.

LOS: Level of Significant.

However, significant (P<0.05) difference was observed between T2 and T3 and as well as between T1, T4 and T5. Mid Rib T1 and T2 were significantly (P<0.05) different from T3, T4 and T5. However, T5 had the highest value. The Main Rib was significantly (P<0.05) different across the treatment groups with T4 having the highest value.

Conclusion and Recommendation

From the results of this trial, it was concluded that Yankasa ewes fed locally prepared premix at 50-100 % inclusion diet level, can satisfactorily supplement industrial premix. An understanding of carcass analysis is imperative in accessing the quality of feed

fed to animals among other things. This study was undertaking to evaluate the carcass characteristics of Yankasa ewes fed locally prepared premix to supplement the industrial premix.

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