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EFFECT OF FEEDING VARYING LEVELS OF SHEANUT *(Vitellaria paradoxa)* MEAL ON CARCASS CHARACTERISTICS OF WEANER RABBITS *(Oryctolagus cunniculus)*

BY

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ABSTRACT

An experiment was canducted to evaluate the effects of feeding varying levels of shea nut meal (SNM) on the carcass characteristics of weaner rabbits. Twenty (20) weaner rabbits aged four (4) weeks and weighing an average of 0.79 kg were randomly assigned to five treatment groups and fed different diets consisting of varying levels of SNM. Treatment 1(TI) which was the control diet had 0 % SNM while treatment 2(T2), 3(T3), 4(T4) and 5(T5) had 10, 15, 20 and 25 % SNM, respectively. The results showed that, live weight, slaughter weight, eviscerated weight and dressed weight were not significantly ($P>0.05$) affected by the various treatments. Also, apart from the upper fore limb and lower fore limb which were significantly ($P<0.05$) affected by the various treatments, the head, backbone, loins, upper hind limb, lower hind limb, intestine and internal organs (heart, lungs, kidney, liver) were not significantly ($P> 0.05$) affected by the various treatment. It was concluded that varying levels of (SNM) had no significant ($P>0.05$) effect on the different cuts of rabbits and up to 25 % can be included in the diet of rabbits without any deleterious effect.

Keywords: Rabbits, Carcass, Sheanut meal

INTRODUCTION:

In Africa, there has been an increasing shortage of meat and other animal protein in the diets of its average class population. In Nigeria for instance, the protein intake has been on the decline as a result of the ever increasing human population. This acute shortage of animal protein in the diets of Nigerians demands that efforts be directed to the production of animals that are prolific and have short generation intervals such as pigs, poultry and rabbits (Olubajo, 1976).

The need for self-reliance in food production, especially animal protein, is critical, not only at national level but also at family levels. In this regard, rabbits have a great deal to offer. Rabbits were introduced into West Africa as farm animals of economic value and have been recognized to have a very important role to play in the supply of animal protein especially in the rural and peri-urban areas. To redress this deficiency in animal production and hence protein intake, Omole and Onwudike (1995) suggested two options. The first is the use of mini livestock such as rabbits for meat production and the next is the adoption of a feeding strategy that maximizes the use of underutilized feed resources and waste in animal production

Rabbit production provides relatively quicker returns on the money invested when compared with other types of animals. Rabbits have a number of characteristics that might be

advantageous to small holder integrated farming. The small body size, short generation interval, rapid growth rate, genetic diversity, high reproductive potentials are characteristics, which make rabbits suitable as meat producing small livestock in developing countries (Arijeniwa *et al,* 2000).

Rabbits meat has been found to be nutritious, low in fat,ine grained,it provides a suitable alternative to poultry meat (Biobaku and Oguntona, 1997). It was reported that rabbit meat played a good role in the prevention of vascular disease due to its extremely low cholesterol and sodium levels when compared to beef, pork and chicken (Biobaku, 1998). Despite these obvious advantages, improved feed formulation and strategies for enhancing the production potential of rabbits, especially in the tropical and sub tropical region of the world have not been fully exploited (M'cenes *et al*, 1999). To make rabbits rearing more viable as a small scale business, Alawa *et al.* (1990) have advocated the development of alternative feeding materials that will be relatively cheap when compared with the commercial feeds and conventional feedstuffs.

Soya beans, groundnut and maize as conventional feed ingredients have been effectively utilized in rabbits feed production. However, these ingredients also form staple food for human beings in most developing countries. The competition between man and livestock for these feed stuffs has resulted in their cost. There is therefore a need for an alternative feed ingredients such as "shea-nut *(Vitellaria paradoxa)* cake".

Shea-nut *(Vttellaria paradoxa)* cake is a by-product of the Shea fat industry. It is the residue after fat extraction from Shea nuts. Even though the amounts that are available has increased due to high demand for shea fat in cosmetics and as a cocoa butter substitute in chocolate, the meal has not been put into considerable use. Shea nut meal possesses anti-nutritive factors such as saponins, tannins and theobromine, which may have detrimental effects on performance of animals. However, it has been shown that fermentation has the potentials to reduce the negative effects of some of these anti-nutritive factors. This by product is cheaper than soya beans as well as groundnut and may supply considerable amount of protein to animals (Hegarty, 1978; Reed *et al.*, 1990)

The proportion of dressed weight to live weight is often used as a measure of meat production in farm animals. Since there is a relationship between weight and physical characteristics of animals which is a reflection of feed efficiency and performance, this association has been used to examine relationship with economics characteristics such as meat yield and reproductive performance (Maciejoski and Zieba, 1982).

This study was designed to evaluate the effect of varying levels of Shea nut cake on carcass parameters of rabbits in terms of weight of different cut parts which are directly proportional to growth of rabbits and also to ascertain the level to which Shea nut meal can be included in the diets of weaner rabbits.

MATERIALS AND METHODS

The experiment was carried out at the rabbitry unit, State Veterinary Centre, Ministry of Livestock and Management, Bosso, Minna. Minna is situated on latitude 9^0 31` and $9^0$ 45`

North and longitude 6^0 31` and $6^0$ 15`East. It has a mean annual precipitation of 1102.6 to 13311mm and temperature range of 38 ^{0}C - 42 ^{0}C and the vegetation is guinea savannah (NSADP,1990)

The animals used for this experiments were obtained from a local market within Minna.The animals where four weeks old with an average weight of 0.79 kg. Twenty rabbits were randomly allotted to five treatments groups with two replicates each in a completely randomized design. The rabbits were placed in hutches made of wood and wire mesh. The hutches were washed and thoroughly disinfected using a disinfectant diluted with water. Feeders and drinkers were placed in each of the hutches. Antibiotics and coccidiostat were administered as prophylactic treatment against bacteria and coccidiosis infection. The rabbits were fed in the morning at 8:00 hrs and in the afternoon at 16:00 hrs .

The ingredients used in formulating the diets for this experiment were maize, groundnut cake, rice offal, shea nut meal, bone meal, salt, lysine, methionine, vitamins/mineral premix. Maize, groundnut, salt and bone meal were bought at Minna central market. Rice offal was obtained from an agro-miller at Gidan Mangoro. Methionine, lysine and vit/min premix were purchased from an agro-veterinary store in Minna. Shea nut meal was obtained from a local source in Bida. Five diets with varying inclusion levels of shea nut meal were formulated and fed to the rabbits. The diets were designated as T1 (0 % SNM), T2 (10 % SNM,) T3 (15 % SNM), T4 (20 % SNM), and T5 (25 % SNM).The composition of the experimental diets are presented in Table 1

Table 1: Composition of experimental diets (%)

Ingredients	diets				
	T1	T2	T3	T4	T5
Maize	60.54	50.99	44.65	41.42	36.66
Ground cake	25.21	24.76	26.11	24.33	24.09
Rice offal	10.00	10.00	10.00	10.00	10.00
Shea nut cake	0.00	10.00	15.00	20.00	25.00
Salt	0.50	0.50	0.50	0.50	0.50
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Vit/min*	0.25	0.25	0.25	0.25	0.25
Bone	3.00	3.00	3.00	3.00	3.00
Total (kg)	100.00	100.00	100.00	100.00	100.00
Crude protein (cp%)	17.99	18.00	18.01	18.00	17.99

***vit/min composition:** to provide vitamin and mineral per 2.5kg diet, Vit. A contains 8.000,000.00 l.U, Vit, D_3,1,500,000.00 IU, Vit. E 7,000.00 Mg, Vit K_3 1,500.00Mg. Vit. B_1 2,000.00 Mg, Vit B_2 2,500.00 Mg, Niacin 15,000.00 Mg, Pantothenic Acid 5,500.00 Mg, Vit. B_6 B_6 2,000.00 Mg. Vit. B_{12} 10.00 Mg. Folic acid 500.00 Mg, Pantothenic Acid 5,500.00 Mg, Vit. B_{12} 10.00 Mg, Folic acid 500.00 Mg, Biotin 12 250 Mg, Choline chloride 175,000.00 Mg, Cobalt 200.00 Mg, Copper 3,000.00Mg, Iodine 1,000.00Mg, Iron 21,000.00Mg. Cobalt 200.00Mg, Copper 3,000.00Mg, Iodine 1,000.00 Mg, Iron 21,000.00 Mg, Magnanese 40,000.00 Mg, Selenium 200.00 Mg, Zinc 31,0000.00 Mg and Antioxidant 1,250 Mg respectively.

Two rabbits from each treatment were selected for carcass analysis at the end of the experimental period. The rabbits picked were kept off feed for 12 hours and each was weighed and slaughtered by slitting the jugular vein, bled and weighed again to obtain the slaughtered weight. Other parameters measured include the eviscerated weight, the dressing percentage which was determined using the formula below.

$$\text{Dressing percentage} = \frac{\text{Carcass weight (kg)}}{\text{Live weight}} \times \frac{100}{1}$$

The weight of the head, forelegs, hind legs, thoracic and abdominal segments and the internal organ (heart, liver, kidney, lungs and intestine) were also recorded. These were expressed as percentage of the live weight.

All data obtained were subjected to analysis of variance (ANOVA) using SPSS (2006), while means were separated with the Duncan Multiple Range Test as described by Steel and Torrie (1980).

RESULTS AND DISCUSSION

Table 2 shows the proximate composition of experimental diets fed to rabbits. The crude protein content ranged from 13.25 % in T1 to 19.25 % in T5. The values obtained for ether extract was highest in T1 (24.00 %) and lowest in T3 (17.00 %) ash content of 10.30 % was recorded in T5 being the highest and (8.00 %) in T3 being the lowest. Crude fibre ranged from 19.04 % in T3 and 10.25 % being the lowest in T2, respectively.

Table 2: Proximate Composition of Experimental Diet.

	Experimental Diet				
Components	T1	T2	T3	T4	T5
Crude protein (%)	13.25	14.08	18.64	19.03	19.25
Moisture (%)	8.57	8.98	8.98	8.66	7.65
Ether extract (%)	24.00	23.00	17.00	17.90	18.00
Ash (%)	9.03	9.62	8.00	8.49	10.30
Crude fibre (%)	11.66	10.25	19.04	18.29	16.75
Nitrogen free extract (%)	33.49	34.07	28.34	27.63	28.05

T_1, (0 % shea nut meal), T_2(10 % shea nut meal), T_3(15 %shea nut meal), T_4(20 % shea nut meal), T_5(25 % shea nut meal).

The result on carcass proportions showed that varying levels of shea nut meal (SNM) inclusion in the diets of growing rabbits had no significant effect ($P>0.05$) on the average dressing percentage, average weight of the carcass and different body parts, such as heart, lungs, kidney, liver, upper hind limb, lower hind limb, head, backbone and loins. While significant differences ($P<0.05$) were observed in the weight of upper fore limb, lower fore limb and the intestine (Table 3). This result revealed better values for rabbits on shea nut based diet than those in the control group.

The non-significant ($P>0.05$) difference observed in the weight of liver, lungs, heart and kidney among the treatments can also be explained with the observations of Sankyan *et al.* (1991) that in goats, the heart attained most of its weight during development of the fetus and may show no appreciable growth thereafter. The non-significant difference between the

animals in the treatment with respect to the liver, lungs, heart and kidney implies that there was no detrimental effect of increased inclusion levels of Shea nut meal on the performance of experimental animals.

Table 3: Weight of body cuts of rabbits fed varying levels of SNM diets

	Experimental Diets						
Parameters	***T1***	***T2***	***T3***	***T4***	***T5***	***SEM***	***LS***
Live weight	1300	1400	1500	1425	1300	46.22	NS
Slaughter weight	90.18	92.85	93.54	96.44	96.13	1.02	NS
Eviscerated weight	70.53	73.48	71.43	71.73	74.79	0.98	NS
Dressed weight	62.39	63.25	61.80	62.87	65.12	0.73	NS
Skin	8.13	10.22	5.71	8.85	9.6	0.99	NS
Heart	0.31	0.28	0.23	0.34	0.31	0.01	NS
Lungs	0.64	0.80	0.67	0.66	0.78	0.03	NS
Kidney	0.73	0.68	0.80	0.81	0.78	0.02	NS
Liver	2.14	2.22	2.45	2.48	2.26	0.08	NS
Upper-hind Limb	18.0	17.58	18.09	17.14	18.41	0.36	NS
Upper-fore Limb	9.93^{b}	11.07^{ab}	11.07^{ab}	10.43^{ab}	11.54^{a}	0.23	*
Lower-hind Limb	1.48	1.68	1.64	2.00	1.99	0.10	NS
Lower-fore Limb	0.85^{b}	0.93^{ab}	0.93^{ab}	1.13^{a}	1.16^{a}	0.05	*
Head	10.25	9.73	9.49	10.92	10.05	0.25	NS
Backbone	9.40	11.49	8.62	9.33	10.42	0.46	NS
Intestine	15.82^{ab}	15.38^{b}	17.96^{ab}	20.40^{a}	17.19^{ab}	0.73	*
Loins	11.27	12.39	11.85	11.74	11.34	0.46	NS

a and b= mean with different subscript on the row are significantly ($p > 0.05$) different
* = significant difference($p \leq 0.05$)
NS = No significant difference ($p \geq 0.05$)
SEM = standard error of mean
SNM = shea nut meal
T_1(% shea nut meal), T_2 (10% shea nut meal), T_3 (15%shea nut meal), T_4 (20% shea nut meal) T_5(25% shea nut meal)

CONCLUSIONS AND RECOMMENDATION:

Based on the results obtained from this study, it can be concluded that varying levels of shea nut meal (SNM) had no significant effect on the carcass characteristics of rabbits and can be included in the diets of rabbits without any deleterious effect.

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