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## Growth Performance and Carcass Characteristics of Weaned Rabbit Fed *Alchornea cordifolia* Leaf Meal

Ebegbulem V. N.

Department of Animal Science University of Calabar P.M.B 1115 Calabar, Nigeria

Dauda A.\*

Department of Animal Science University of Calabar P.M.B 1115 Calabar, Nigeria

Udoudo M. J.

Department of Animal Science University of Calabar P.M.B 1115 Calabar, Nigeria

**Abstract:** Thirty six (36) weaned rabbits between the ages of 4-6 weeks were fed graded levels of *Alchornea cordifolia* leaf meal (ACLM) at different inclusion levels in the diet with the aim of evaluating the effect of ACLM on growth performance and carcass characteristics of rabbits. Animals were assigned to the test diets using a completely randomized block design (CRBD). Nine (9) rabbits were randomly allotted to each dietary treatment T1 T2 T3 T4 (diet formulated contain 0%, 5%, 10% and 15%) respectively with three (3) rabbits serving as a replicate after balancing for body weight. All conventional management practices were followed. The experiment lasted for eight (8) weeks. Parameters measured for growth performance are; final body weight, feed intake, feed conversion ratio, total weight gain and for carcass characteristics are; live weight, dressed weight, dressed percent relative weight of major cut (head, neck, shoulder, rack, back cut loin and thigh). The result obtained from this study showed that growth performance of rabbits fed ACLM showed no significant difference ( $P>0.05$ ). The results of carcass characteristics of rabbits fed ACLM showed significant differences ( $P<0.05$ ) in the mean live weight, dressed weight, dressed percent, neck, shoulder and loin. The highest value for live weight, dressed weight, dressed percent, shoulder and neck are observed in T1 (0% ACLM). The study concluded that inclusion level of 5-10% of ACLM is good for optimum performance.

**Keywords:** Rabbit; Growth; Carcass *Alchornea cordifolia*; Characteristics and performance.

### 1. Introduction

The need for adequate supply of quality protein in developing countries like Nigeria is on the increase and it has become necessary to exploit species of animals that are prolific and have short cycle of production. Adeyemi, *et al.* [1] pointed out that poultry, pig and rabbit represent the fastest means of correcting protein shortage of animal protein intake. This is because apart from their high rate of reproduction, these species are characterized by the best efficiency of nutrient transformation into high quality protein. Ukachukwu and Ouagwu [2] reported that the gap between the requirement and supply of animal protein in Nigeria is attributed to shortfall in animal production which is occasioned by scarcity and high cost of inputs in animal production. The increasing competition between man and his livestock for available gains and feed coupled with Nigeria neglect of Agriculture, has led to high cost of available feed resources. Agunbade, *et al.* [3] noted that apart from the fact that these are keenly competed for by humans, they are being imported into the country resulting in a situation that degenerate into a continuous rise in the cost of feed for human and animal feeding. Measures aimed at alleviating feed cost in animal production centered on the introduction of non-conventional feedstuffs. The non-conventional feed ingredient could be processed into a high quality feedstuff that can favourably supplement protein and energy sources which currently plays the dual note of feeding man and his livestock. Rabbits (*oryctolagus caniculus*) have been recommended [4] as having the best productive advantage to utilize the non-conventional feed sources to bridge the protein gap. Tree fodders maintain higher protein and mineral contents during growth than grasses, which decline rapidly in quality with maturity [5]. Tree fodders are important source of nourishment for grazing ruminants and as supplements to improve the productivity of herbivores fed on low quality feeds. Browse forages form part of the complex interactions between plants, animals and crops [6] *Alchornea cordifolia* is a tropical browse plant that is little known and used in the feeding of non-ruminant animals. It is valuable in subsistence agriculture because its foliage are frequently fed to grazing animals or processed into leaf meal for non-ruminants [7]. The objective of this work was to determine growth performance and carcass characteristics of weaned rabbits fed *Alchornea cordifolia* leaf meal (ACLM).

## 2. Materials and Method

This study was carried out at the rabbitary unit of the Department of Animal Science Teaching and Research farm, University of Calabar, Cross River State, Nigeria. A total of thirty six (36) weaned rabbits mixed breed between the aged of 4-6 weeks were used for the study. Animal were assigned to the test diets using a completely randomized block design (CRBD). ). Nine (9) rabbits were randomly allotted to each dietary treatment T1 T2 T3 T4 (diet formulated contain 0%, 5%, 10% and 15%) respectively with three (3) rabbits serving as a replicate after balancing for body weight. All conventional management practices were followed. The experiment lasted for eight (8) weeks. Parameters measured for growth performance are; final body weight, feed intake, feed conversion ratio, total weight gain and for carcass characteristics are; live weight, dressed weight, dressed percent relative weight of major cut (head, neck, shoulder, rack, back cut loin and thigh). Results obtained were subjected to one way Analysis of Variance (ANOVA) as reported by [Steel and Torries \[8\]](#) and mean were compared using Duncan Multiple Range Test.

## 3. Results and Discussions

The results of growth performance of rabbits fed ACLM are presented in Table 2. The growth performance parameters showed no significance difference ( $P>0.05$ ). The final weight ranged from 1169 – 1400g but no treatment effect as the level of ACLM was increasing in the diet. This finding corroborates the report of [Alikwe et al. \(2014\)](#) who replaced soybean with ACLM for rabbits. The daily feed intake was (51.27-52.79g/rabbit/day) although, it was not significant ( $P>0.05$ ) but the highest value was observed in T3 (10%) ACLM. The increased daily feed intake with ACLM inclusion at 10% may be due to possible increase in the level of antinutritional factors such as tannin which stimulate rabbit slaver which in turn increase feed intake as the dietary ACLM inclusion increased. [Alikwe, et al. \[9\]](#) reported that there was significant difference ( $P<0.05$ ) in feed intake of the rabbits between 15% ACLM and the rest of the treatments is an indication that inclusion levels of 15% and above of ACLM in rabbit diet may decrease feed intake while inclusion levels between 5 – 10% had better performance in feed intake and this is probably due to the lower inclusion levels and also the caecum of the rabbits can digest highly fibrous plant materials. This agrees with the findings of [Aduku and Olukosi \[10\]](#), who stated that rabbits are pseudo-ruminants and as such are able to utilize forages as well as concentrates. The good feed conversion ratio in this study appeared in T1 (0%) of ACLM. improvement of feed conversion ratio had been achieved through addition of proteases in rabbit diets [11]. However, in some studies no improvement of rabbit performance was detected as a result of exogenous enzyme supplementation and ACLM [12, 13]. This suggests that the ability of enzyme supplementation in rabbit nutrition could vary and might depend on the type of diet. The performance of the rabbits fed the test diet in this study was relatively low, in particular when compared to the control. The results of carcass characteristics of rabbits fed ACLM are presented in Table 5. Significant differences ( $P<0.05$ ) were observed in the mean live weight, dressed weight, dressed percent, neck, shoulder and loin. The highest value for live weight, dressed weight, dressed percent, shoulder and neck are observed in T1 (0% ACLM). This could be attributed to the higher percentage of the anti-nutritional factors in ACLM which might render the nutrient unavailable for the animal utilization in the body. [Alikwe, et al. \[9\]](#) reported that other carcass parameters; stomach, spleen, liver and intestine decline with increasing levels of ACLM in the diet which may be as a result of some antinutritional factors in *Alchornea cordifolia* which affects the rabbits in terms of final product (carcass). The author's report agrees with the findings of [Bamgbose, et al. \[14\]](#) who stated that high inclusion of Tigernut Meal (TNM) in the diet of weaner rabbits decrease protein percentage in carcass.

## 4. Conclusion

The study concluded that the use of ACLM as protein in the diet of rabbits has no negative effect, but inclusion level of 5 – 10 % is better for optimum performance of growing rabbit. However, further research on the physiological responses of rabbits is needed.

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**Table-1.** Gross composition of experimental diets for weaner rabbits

Ingredient	T1 (0%)	T2 (5%)	T3 (10%)	T4 (15%)
Yellow Maize	36.00	36.00	36.00	36.00
ACLM	0.00	5.00	10.00	15.00
Palm oil	2.20	2.20	2.20	2.20
Crayfish dust	2.00	2.00	2.00	2.00
Wheat offal	16.00	11.00	6.00	1.00
Rice husk	25.00	25.00	25.00	25.00
Bone meal	2.00	2.00	2.00	2.00
Lysine	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Salt	0.10	0.10	0.10	0.10
Total	100.00	100.00	100.00	100.00
Calculated analysis				
% crude protein	15.85	15.87	15.92	15.97
% crude fibre	10.24	10.78	101.32	11.87
MEKcal/kg	2546.24	2621.46	2696.24	2711.24

ACLM= *Alchornea cordifolia* leaf meal

Premix\* (grow fast) Manufactured by Animal Care Service Consults Nigeria Ltd., Lagos, supplying the following per kg ofpremix; vitamin A = 32,000,000 IU, vitamin B3 = 640,000 IU, vitamin E = 2,000 IU, vitamin K = 800 mg, thiamine (B1) =600 mg, riboflavin (B2) = 1600 mg, pyridoxine (B6) = 600 mg, vitamin B12 = 4 mg, pantothenic acid = 2000 mg, folic acid= 200 mg, biotin = 8 mg, choline = 80 mg, antioxidant = 50 g, managanese = 32 g, zinc = 20 g, iron = 8 g, copper = 2 g, iodine = 0.48 mg, selenium = 80 mg and cobalt = 80 mg.

**Table-2.** Growth Performance of Rabbit fed ACLM

Parameters	T (0%)	T2 (5%)	T3 (10%)	T4 (15%)	SEM	LOS
Initial weight (g/rabbit)	550.00	575.00	587.50	587.50	60.60	
Final weight (g/rabbit)	1400.00	1269.00	1350.00	1169.00	53.50	
Total feed intake (g/rabbit)	2907.00	2875.00	2956.00	2871.00	72.10	
Weekly feed intake (g/rabbit)	363.30	359.30	369.50	385.90	9.01	
ADF (g/rabbit/day)	51.90	51.33	52.79	51.27	1.29	
Total weight gain (g/rabbit)	850.00	69.40	762.50	581.50	60.90	
Weekly weight gain (g/rabbit)	106.25	86.72	95.31	72.66	7.61	
ADG (g/rabbit/day)	15.18	12.39	13.62	10.38	1.09	
FCR	3.42	4.14	3.88	4.94	0.35	
Mortality	16.67	0.00	0.00	0.00		

a, b, c means in the same row with different superscript are significantly different ( $P < 0.05$ ), NS = Not Significant different ( $P < 0.05$ ) ADF=average daily feed intake, ADG=average daily gain, FCR=feed conversion ratio, SEM=standard error of mean, LOS= level of significance, ACLM= *Alchornea cordifolia* leaf meal

**Table-3.** Carcass Characteristics of rabbit fed ACLM

Parameters	T1 (0%)	T2 (5%)	T3 (10%)	T4 (15%)	SEM	LOS
Live weight (g)	1398.00a	1200.00b	1300.00ab	1158.00b	44.70	*
Dressed weight (g)	820.00a	666.70ab	700.00ab	550.00b	46.10	*
Dressed percent (%)	58.40a	55.46a	53.80a	47.52b	1.72	*
<b>Relative weight (%) of major cuts</b>						
Head	8.22	8.48	7.49	6.95	0.49	
Neck	1.39b	1.56ab	2.25a	2.08ab	0.23	*
Shoulder/forelimb	8.90a	7.59ab	6.94bc	5.90c	0.41	*
Lung/trachea	0.54	0.61	0.57	0.45	0.06	
Rack	8.85	9.34	9.44	8.19	0.62	
Back cut	15.53	14.58	16.48	14.46	0.91	
Loin	4.59a	3.30	2.93b	3.40ab	0.44	*
Thigh/hind limb	15.76	15.35	14.44	13.76	0.62	

*a, b, c means in the same row with different superscript are significantly different (P<0.05), NS = Not Significant different (P<0.05)*

SEM=standard error of mean, LOS= level of significance