

PERFORMANCE AND CARCASS CHARACTERISTICS OF GROWER RABBITS FED GRADED LEVELS OF CASSAVA LEAF (*Manihot esculenta*) MEAL

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Abstract

The study was to determine the effect of feeding graded levels of cassava leaf (*Manihot esculenta*) meal in place of full fat soya bean meal on the performance and carcass characteristics of grower rabbits. Fresh cassava leaves were shade dried to a constant weight and milled. Sample of the cassava leaf meal were subjected to proximate analysis to determine the nutrient composition and the anti-nutrients content. Eighteen grower rabbits were weighed and randomly assigned to 3 dietary treatments (T1, T2 and T3) containing 0, 10 and 20% cassava leaf meal respectively in a 3×6 completely randomized design. Diet T1 served as the control diet with 0% CLM. Diets T2 and T3 contained 10 and 20% CLM. Feed and water were provided ad-libitum for 56 days. The result of the performance revealed no significant difference ($P>0.05$) in the total weight gain (731.33-743.33g); average daily weight gain (13.06-13.27g); total feed intake (2675.00-2912.00g); average daily feed intake (47.77-52.00g) and the feed conversion ratio (3.75-3.92). There were no significant difference for the cut parts, visceral organs, and small and large intestine length. No adverse effect was observed on the rabbit as a result of the anti-nutrient in the test diets. The result showed high yield of live weight, carcass weight and skin with 10% cassava leaf meal. This study suggests that replacement of soybean meal with up to 20% cassava leaf meal will increase the carcass weight, live weight, skin weight and visceral organs development at a lower cause.

KEYWORDS; Cassava leaf meal, Grower rabbits, Performance, Cut parts, anti-nutrients.

Introduction

Increased competition for available conventional feedstuff and its high cost have led to animal nutritionists, scientists and agriculturists having the need for research into the use of non-conventional feedstuffs that are cheap, readily available and possible substitute for more expensive protein and energy sources (Obun and Adeyemi,2012).

The feeding cost constitutes about 80% of the total cost of intensive production in livestock industry (Tewe et al., 2002). Hence the focus is on alternative feedstuff which could be either substituted directly for cereals or can be included a certain level to attain a comparable production quality with the conventional cereal without deleterious effect on the animal health (Ukachukwu, 2008).Cassava which is widely cultivated in the tropics appears to be one of the possible alternatives for overcoming these chronic high feed cost in livestock industry (Ukachukwu, 2008).

Ravindran and Ravindran (1988) reported that the yield of cassava leaves can be as much as 4.6 tones dry matter per ha taken as a by-product of root harvest. Cassava leaves as a protein source can be combined with low-protein cassava peels and used in rabbit feeding. Both are wastes constituting disposal problems especially where large quantities of cassava plants are harvested and processed. Cassava leaf contains some anti-nutritional factors like cyanogenicglucosides, tannin, saponins, etc which are toxic to the animals when consumed without reducing the concentration of the toxins. Studies by Ravindran *et al* 1987).has demonstrated the possibility of producing cassava leaf meal with low cyanide levels..

There has been increased awareness of rabbit meat production in developing countries as a means of alleviating animal protein shortages. Although protein can be sourced from plants, the place of animal protein remain unequal, due to its balanced amino acid profile.

Materials and Methods

The research was conducted at the Rabbitry Unit of the Teaching and Research Farm of the Department of Animal Production and Health, Faculty of Agriculture and Life Sciences, Federal University Wukari, Taraba State. Wukari is located at latitude 7°51' N orth and Longitude 9°47' East (Wikipedia, 2011). Fresh cassava leaves (*Manihot esculenta*) were harvested from the farms around Wukari. The leaves were washed and dried under shade for three days to a constant weight. The dried cassava leaves were milled and put into an airtight container. Sample of the milled cassava leaves was taken for proximate analysis and anti-nutrient content determination. Three diets were formulated using Cassava Leaf Meal (C.L.M.) in replacement for full fat soybean as shown in Table 1. Diet 1 served as a control with 0% CLM, while diet 2 and 3 contained CLM at 10 and 20% inclusion levels respectively.

Eighteen (18) 4-5 weeks old female rabbits of mixed breeds were used in an 8 weeks feeding trial. The animals were randomly assigned to three experimental diets on the basis of equal mean live weight to three treatments groups each with six rabbits in a Completely Randomized Design (CRD). Each group had three replicates with two rabbits per replicate.

The rabbits were housed in a wood-wire hutches equipped with feeders and drinkers. The experimental diets, fresh forages (*Camelina bengalensis*) and water were provided ad-libitum. The rabbits were allowed to acclimatize to their various hutches for one week during which they were dewormed and given antibiotics.

The data collected were feed intake, body weight, feed cost/kg gain and mortality. Other data collected were Head, heart, lungs, kidney, liver, spleen, stomach, large intestine, small intestine, caecum, and pancreas. Data collected was subjected to statistical analysis using Analysis of Variance (ANOVA). Differences between mean was separated using LSD.

Result and Discussion

The crude protein and energy levels of the formulated diets (Table 1) were 20.17% and 3006.06 Kcal/kg for Diet 1, 18.665% and 2914.59Kcal/kg for Diet 2 and 17.15% and 2814.74Kcal/kg for Diet 3. The respective crude fiber for diets 1, 2 and 3 are 4.79%, 5.09% and 5.25%. The feed cost per kilogram diet progressively decreased from N139.62 (Diet 1) to N126.05 (Diet 2) and N112.47 in Diet 3.

Table 1. Percentage Composition of the Experimental Diet for Grower Rabbits.

Diets	T1	T2	T3
Ingredients	control	10% CLM	20% CLM
Maize	36.40	36.40	36.40
Full fat soybean	31.60	28.44	25.28
CLM	-	3.16	6.32
Maize offal	27.70	27.70	27.70
Bone meal	3.00	3.00	3.00
Premix	0.50	0.50	0.50
L- methionine	0.25	0.25	0.25
L- lysine	0.25	0.25	0.25
Salt	0.30	0.30	0.30
Total	100.00	100.00	100.00
CALCULATED CHEMICAL COMPOSITION			
Metabolizable energy (Kg/Kcal)	3006.06	2914.59	2814.74
Crude protein (CP)	20.17	18.66	17.15
Crude fibre (CF)	4.79	5.09	5.25
Feed cost/kg diet (₦)	139.62	126.05	112.47

The result of the performance of rabbits fed graded levels of cassava leaf meal is as shown in Table 2. The result showed no significant difference ($P > 0.05$) in total weight gain, average daily weight gain, total feed intake, average daily feed intake and feed conversion ratio. The Average Daily Feed Intake of 47.77-52.00g recorded for this study is found to be lower than the value range of 65.00-81.69g (Adeyemi et.al.2014) when he fed graded levels of Unfermented Cassava Leaf: Peel Meal Mix as a replacement for Maize to grower rabbits. The result is however similar to the value range of 45-55g observed by Ozung et.al. (2012) who fed Paw-Paw Peel Meal Based Diets to Weaner Rabbits.

The Average Daily Weight Gain (13.06-13.27g) is lower than that of 20.07-16.92g as reported by Adeyemi et.al. (2014) when he fed graded levels of Unfermented Cassava Leaf: Peel Meal Mix as a replacement for Maize to grower rabbits.

The numerically lower Feed Intake values noticed in the test diets could be attributed to the low palatability in the test diets as a result of the Cassava Leaf Meal portion included in them. The numerically lower Feed Conversion Ratio recorded in Diet 2 revealed that the test diet containing 10% was better utilized than the control Diet and Diet 2.

Table 2. Performance Characteristics of Grower Rabbits Fed Cassava Leaf Meal Based Diets.

PARAMETERS (g)	T1 (0%)	T2 (10%)	T3 (20%)	SEM
Initial Weight	1056.67	1085.33	1091.67	
18.18 ^{ns}				
Final Weight	1800.00	1816.67	1833.33	
10.64 ^{ns}				
Total Weight Gain	743.33	731.33	741.67	
41.66 ^{ns}				
Average Daily Weight Gain	13.27	13.06	13.24	
0.73 ^{ns}				
Total Feed Intake	2912.00	2675.00	2843.33	
55.50 ^{ns}				
Average Daily Feed Intake	52.00	47.77	50.77	
2.78 ^{ns}				
Feed Conversion Ratio	3.92	3.75	3.87	
0.36 ^{ns}				

NS= Not Significantly Different ($P > 0.05$)

S.E.M.= Standard Error Mean

The result of the carcass characterization is presented in Table3. The result indicated no significant difference ($P > 0.05$) between the test and the control diets in all the parameters considered for carcass characterization.

The result of the carcass characteristics was found to be similar with values reported by Ekpo et al.,(2016) who fed graded levels of pumpkin based diet to rabbits. However, the insignificant difference of the carcass characteristics for the different studies mentioned above may be that the fibre content in the diets did not impair nutrient utilization, hence no adverse effect on carcass characterization was observed.

Table 3. Carcass Characteristics of Rabbits Fed Cassava Leaf Based Diets

Parameters % live weight	(0%) CLM	T2 (10%) CLM	T3 (20%) CLM	SEM
Live weight	1600.00	1800.00	1683.33	82.21ns
Carcass weight	1500.00	1716.67	1616.60	92.30ns
Dressed weight	803.33	916.67	918.18	37.71ns
Dressed percentage	50.22	50.88	54.76	1.85ns
Skin	118.00	142.24	128.42	14.01ns
Tail	8.91	11.48	8.04	1.68ns
Feet	45.48	34.77	33.15	2.84ns
Head	129.43	130.36	121.82	21.13ns
Stomach	64.16	67.49	72.52	9.54ns

Visceral organs (% live weight)				
Liver	2.55	2.90	2.80	0.43ns
Lungs	0.77	0.62	0.60	0.10ns
Kidney	0.62	0.63	0.62	0.07ns
Caecum	6.42	6.76	5.21	0.52ns
Heart	0.23	0.26	0.25	0.02ns
Small intestine	79.50	44.98	64.05	13.40ns
Small intestine (cm)	314.67	314.33	356.33	14.27ns
Large intestine	36.44	34.71	34.41	2.83ns
Large intestine (cm)	89.33	87.33	86.33	2.19ns

ns: Not significant (P>0.05)

SEM: Standard Error Mean.

Conclusion

The study showed that Cassava Leaf Meal can replace Full Fat Soybean Meal in the diets of grower rabbits up to 20% inclusion level without any adverse effects on their performance, carcass characterization and at a reduced cost.

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