

GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF WEANER RABBITS FED AFRICAN WILD GRAPE LEAF (*Lannea microcarpa*)

^{1*}Abdullahi, A. Y., ²Abdulrazak, N., ¹Khaleel, A.G., ¹Zango, M.H., ¹Madaki, S., ¹Nasir, M. and ¹Saidu, S.S.

¹Department of Animal Science, Faculty of Agriculture and Agricultural Technology, Kano University of Science and Technology Wudil, PMB 3244, Kano 20027, Nigeria

²Department of Animal Science, Sule Lamido University Kafin-hausa, Jigawa, Nigeria

*Corresponding author: auwalyusuf2@gmail.com; +234 9067674421

ABSTRACT

The study was conducted at Teaching and Research Farm of Department of animal science, Kano University of Science and Technology Wudil to determine the growth performance and carcass characteristics of weaner rabbit fed varying level of concentrate. A total of twenty mongrel weaner rabbits (mixed breeds) were randomly allocated to Five (5) diets formulated with African wild grape leaf (meal) at 0, 5, 10, 15 and 20% levels designated as treatments T₁, T₂, T₃, T₄ and T₅ respectively. Completely randomized design CRD was employed and each treatment was replicated 4 times. The experiment lasted for 8 weeks. The results on performance showed that there were significant differences ($P < 0.05$) in the final body weight (900-1325g), daily feed intake (900.00-100.22g) and daily weight gain, (7.123-15.774g). The feed conversion ratio (5.772-16.831) and the feeds cost per kilogram of weight of gains (496.4-1430.6g) were significantly ($P < 0.05$) recorded by feeding the dietary treatments. The cost tends to decrease T₁—T₃, however, it increases in treatment T₄ and T₅. The results showed that there were significant differences ($P < 0.05$), carcass weights (662.50- 990.60g) and dressing percentage (50.750- 64.85). There were significant differences ($P < 0.05$) in the liver, lungs and kidney weights (22.3-38.3g; 5.05-10.9g; 6.25-9.95g). It can be concluded that in cooperation of African wild grape (leaf) in the diet of weaner rabbits was best at 10% inclusion level without any depression on the growth performance, carcass and organs weights with significant reduction in the feed cost.

Keywords: African-wild grape; Growth performance; Carcass characteristics; Weaned rabbit; Feed cost.

INTRODUCTION

Feed is one of the major problems of intensive rabbit's production in Nigeria due to the competition between man, animals and industries for conventional feed materials. These lead to escalating cost of conventional feed ingredients and has made feed cost to account for 70% of the total cost of production (Akinmutumi, 2004). Rabbit production has enormous in alleviating the problem of animal protein supply in developing economy (Biobaku and Bosomi, 2003). In recent times, Rabbit production has received a renewed attention as an alternative to poultry production due to the high cost of feed often associated with commercial poultry production. Rabbits can thrive well on fibrous feed ingredients based on agro-industrial by-products, forages or a combination of both. The potential of forage as feed for rabbit is of particular significant because of their ability to effectively digest of protein (Bello 2003). These necessitated the need to seek for alternative feed source in forages. African wild grape (*Lannea microcarpa*) is Tropical tree of family Anacardiaceae that can be one of the non-conventional feed ingredient that are commonly found or available in most of the Nigerian grazing reserved. It is grape like fruit which serve as a source of vitamin when eaten fresh or processed as juice, while ruminant animals are using its leaves as forage (Haarmeye *et al.*, 2013). Non-conventional feedstuff offers the best alternative in our environment for reduction of feeds cost and by extension the cost of meat and the animal product (Dafwang *et al.*, 2001). Therefore, this research investigates the effect of dietary inclusion of the African wild grape on growth performance and carcass characteristics of weaner rabbit.

MATERIALS AND METHODS

Experimental site

The study was conducted at the Rabbitary Unit of the Teaching and Research Farm, Department of Animal Science, Kano University of Science and Technology Wudil, Kano State. The farm is located on latitude 11° 37' N and longitude 8° 58'E at an altitude of 403m above sea level. The annual rainfall ranges from 850 to 870 mm, while minimum and maximum temperatures ranges between 26 and 33°C. The relative humidity of the region is always low and ranges between 40 to 51.3% (Olofin *et al.*, 2008).

Experimental Diet, Animals and Their Management

Five experimental diets were formulated at different level of inclusion of African wild grape leaf meal at 0, 5, 10, 15 and 20% levels designated as treatments T₁, T₂, T₃, T₄ and T₅ respectively (Table 2). Twenty (20) mixed sex of weaner rabbit (Mongrel) were used. The experimental design used was Completely Randomized Design

(CRD) and each treatment was replicated (4) times consisting one animal per cage. They were allowed a week for adjustment and treated against internal and external parasites before the commencement of the research. Administration of ivermectin at dose rate of 0.1ml subcutaneously and antibiotics (Oxytetracycline) were given via drinking water for 3-4 consecutive days as prophylaxis treatment. The experiment was last for six (6) weeks.

Data collection on Growth Performance, Carcass Characteristics and Organs Weight

The data collected on growth performance includes body weight, daily feed intake, total feed intake, feed conversion ratio and mortality rate. Similarly, data collected on carcass analysis includes final live weight, slaughtered weight, pelted weight, dressed weight and dressing percentage. The organ weights are heart, lung, liver, spleen kidney, stomach, intestines and caecum. All they were recorded and calculated. African wild grape leaves were dried and subjected to proximate analysis using analytical method of (AOAC, 2005) (Table 1) at Animal Science Laboratory, Kano University of Science and Technology Wudil, Kano state. All data collected were subjected to analysis of variance (ANOVA) using Statistical Analysis System (SAS). Duncan's Multiple Range Test was used to separate the means (Duncan, 1955) where treatment means were significant ($p < 0.05$).

Table 1: Proximate composition of African Wild Grape Leaf

COMPONENTS	CONTENTS
Moisture (%)	3.24
Protein	19.14
Lipids	64.90
Carbohydrates	10.85
Ash	3.11

Source: Kano university of Science and Technology Wudil. Animal Science Laboratory

Table 2: Composition of weaner Rabbit diet containing African wild grape leaf meal

Ingredients	T1 (0%)	T2 (5%)	T3 10%	T4 (15%)	T5 (20%)
Maize	43.02	38.02	33.02	28.02	36.02
Soya bean	15.89	15.89	15.89	15.89	15.99
African w. g.	0.00	5.00	10.00	15.00	20.00
Wheat Offal	36.59	36.59	36.59	36.59	36.59
Bone meal	3.50	3.50	3.50	3.50	3.50
Salt	0.30	0.30	0.30	0.30	0.30
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.20	0.20	0.20	0.20	0.20
Vitamin. P	0.30	0.30	0.30	0.30	0.30
Total	100	100	100	100	100
Calculated Analysis					
Crude protein (%)	18.00	18.00	18.00	18.00	18.00
Metabolizable	2568	2453	2534	2623	2645
Energy (Kcal/kg)					
Crude fibre	12.23	11.98	12.34	13.01	12.02
Ether extract	4.56	5.45	4.98	5.32	5.12
Ash	6.32	6.19	5.34	6.02	5.88

RESULTS AND DISCUSSION

The results on growth performance of weaned rabbit fed varied inclusion levels of African Wild Grape Leaf meal is presented in Table 3. There was significant difference ($P < 0.05$) in the final body weight, daily weight gains and daily feed intake. The final body weight was found to be highest for rabbits fed in Treatment 3 (1325.00g) similarly, the daily weight gain was significantly ($P < 0.05$) highest in rabbits fed in T3 (15.774g) compared to other treatments. This is in agreement with Bamikole *et al.* (2005) who reported that there was an increase in daily weight gain after feeding rabbits with mulberry leaves based diet. Feed intake was significantly ($P < 0.05$) recorded higher in T1 and T5 having 4209.0g and 3963.6 respectively. This agrees with the report of Aduku *et al.* (2008) who reported that the feed intake by rabbits increase with increasing level of crude fibre (CF). The feed conversion ratio and feed cost per kilogram gain were significantly ($P < 0.05$) affected by the dietary treatments. Numerically, the lowest and good value of FCR was recorded in T3 (5.772). This indicated that T3 (45%) was the best diet per unit gain. This is similar to Alokun, J.A. (2000) who reported that the lower the FCR the better the diet in rabbit. The feed cost/kg gain was significantly ($P < 0.05$) better and the lowest in T3 (N834.47) This is in agreement with

the finding of Iyeghe-Erakpotobor *et al.* (2012) who reported a lower feed cost /Kg gain with the higher savings in rabbits fed varying levels of African wild grape (leaf).

Table 3: Growth Performance of weaned mongrel rabbit fed African wild grape leaf meals

Parameters	T1 (0%)	T2 (5%)	T3 (10%)	T4 (15%)	T5 (20%)	SEM
Initial body weight (g)	637.50	605.00	662.50	662.50	650.50	30.89
Final body weight (g)	1175.00 ^{ab}	1050.00 ^{cb}	1325.00 ^a	900.00 ^c	950.00 ^c	62.36
Average Daily weight gain (g)	12.798 ^{ab}	10.595 ^b	15.774 ^a	8.655 ^c	7.143 ^c	1.21
Total weight gain (g)	537.50 ^{ab}	445.00 ^b	662.50 ^a	237.50 ^c	300.00 ^c	50.97
Average Daily feed intake (g)	100.215 ^a	90.595 ^b	90.668 ^b	92.143 ^b	94.375 ^{ab}	2.92
Total daily feed intake (g)	4209.0 ^a	3805.0 ^b	3807.8 ^b	3870.0 ^b	3963.6 ^{ab}	122.82
Feed conversion ratio	7.983 ^b	9.80 ^b	5.772 ^b	16.831 ^a	14.294 ^a	1.73
Feed cost (#)	88.00 ^a	87.00 ^b	88.00 ^a	85.00 ^d	84.00 ^e	0.00
Feed cost/kg gain	702.5 ^b	792.3 ^b	496.4 ^b	1430.6 ^a	1200.7 ^a	147.28
Mortality	0.2500	0.0000	0.0000	0.0000	0.0000	0.13

^{abc}: Means with different superscripts are significantly different ($p < 0.05$) SEM= Standard error of means, T= Treatment

The result on carcass analysis is presented in Table 4. There was significant difference ($P < 0.05$) in final live body weight. The highest value of final weight was recorded in T3 (1325.00g) this agrees with the report of Jensen (1996) who reported that there was significant difference ($P < 0.05$) on live weight of broiler when fed with soya beans residue meal replacing groundnut cake. There was significant difference ($P < 0.05$) in carcass weight. T₃ had the highest value (860.60g) this is agreed with the Values obtained by Biya *et al.* (2008) in which the carcass weight ranges from 988.24g- 1335.00g on the weaned rabbit performance in the tropics. The dressing percentage was significantly different ($P < 0.05$) in which the T3 had the highest value (64.849%) This is also contrary to the report of Alade *et al.* (2005) who reported that there were not significant differences ($P > 0.05$) in dressing percentage on the dietary treatment effect on the performance of rabbit fed the four treatment diets.

Table 4: Carcass Characteristics and Organ weight of weaned mongrel rabbit fed African wild grape leaf meals

Parameters	T1 (0%)	T2 (5%)	T3 (10%)	T4 (15%)	T5 (20%)	SEM
Final live body weight (g)	1175.00 ^{ab}	1050.00 ^{cb}	1325.00 ^a	900.00 ^c	950.00 ^c	62.36
Carcass weight (g)	662.50 ^c	764.50 ^b	990.60 ^a	865.00 ^{ab}	682.50 ^c	32.92
Dressing percentage (%)	09 ^b	53.986 ^b	64.849 ^a	62.778 ^a	50.750 ^b	2.22
Kidney fat weight (g)	6.2500 ^b	6.1000 ^b	8.5500 ^a	8.4560 ^a	9.1000 ^b	0.44
Stomach weight (g)	12.1500 ^b	14.8500 ^b	17.4000 ^a	15.1500 ^b	14.6500 ^b	0.48
Caecum weight (g)	26.2500 ^d	28.3000 ^c	30.1000 ^b	28.6000 ^{bc}	33.7500 ^a	0.59
Colon weight (g)	6.3000 ^b	5.2000 ^c	5.2000 ^c	5.2500 ^c	7.1000 ^a	0.22
Small intestine (g)	227.500 ^b	245.000 ^a	212.000 ^c	250.00 ^a	245.000 ^a	0.82
large intestine (g)	18.9500 ^b	10.5500 ^c	20.000 ^{ab}	11.5500 ^b	20.4500 ^a	0.51
Head weight (g)	101.550 ^c	109.6500 ^{ab}	121.100 ^b	119.000 ^b	107.4000 ^d	0.60
Leg weight (g)	35.300 ^{ab}	31.0000 ^d	36.5500 ^a	33.0500 ^c	33.4000 ^{cb}	0.77
Pelt weight (g)	84.500 ^d	88.500 ^c	93.100 ^b	101.950 ^a	73.650 ^c	1.31
Liver (g)	27.050 ^c	33.150 ^b	22.300 ^d	38.300 ^a	26.350 ^c	0.138
Lungs (g)	10.9000 ^a	10.9000 ^a	6.7000 ^b	5.0500 ^c	6.9500 ^b	0.138
Heart (g)	2.15000	2.40000	2.35000	2.55000	2.05000	0.81
Kidney (g)	8.8500 ^{ab}	6.6500 ^{cb}	8.8500 ^{ab}	9.9500 ^a	6.2500 ^c	0.05
Spleen (g)	0.35000	0.35000	0.35000	0.35000	0.35000	0.22

^{abc}: Means with different superscripts are significantly different ($p < 0.05$) SEM= Standard error of means, T= Treatment

The results on organs weights of weaned rabbits was presented in Table 4. The results showed there was no significance difference ($P > 0.05$) in heart weight. This is in agreement with the report of Onyennan (2005) who fed graded level of lima bean residue and recorded no significant difference in heart weight. It is also similar to the report of Alade *et al.* (2005) and Togun *et al.* (2006) who all recorded no significance difference ($P > 0.05$). The lungs, liver and kidney weights showed significant differences ($P < 0.05$). The lung was found highest in T₁ and T₂. However, liver weight was higher in T₄ having (38.300g), likewise, Kidney weight was highest in T₄ (9.9500g).

CONCLUSION

Form the results of this research, it can be concluded that inclusion levels of African wild grape leaf meals at 10% appeared best, even though up to 20% can be used safely in the diet of grower mongrel rabbit with no detrimental effect on their growth

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