



EFFECT OF NEEM (*Azadirachta indica*) LEAF MEAL ON THE GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF MALE GROWING RABBITS

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Abstract

A total number of 36 male growing rabbits of mixed breeds with an average weight of 550g were used to determine the growth performance and carcass characteristics of male growing rabbits fed diet containing neem leaf meal (NLM). The experiment was a complete randomized design (CRD) with four treatment diets replicated thrice. Wheat offal was replaced with NLM in the diets 0, 5, 10 and 15%, respectively. The study lasted for 13 weeks. Feed and water were supplied *ad libitum*. Results on growth performance showed that all the measured indices were similar ($p > 0.05$) across the treatments. Carcass weight, dressing percentage, hind limbs, loin, neck and liver were significantly ($p < 0.05$) influenced by neem leaf meal. It was concluded that male growing rabbit could only effectively tolerate 5% NLM dietary inclusion as a replacement of wheat offal.

Key words: growth, carcass, rabbit, neem

Introduction

An increase in the standard of living inevitably calls for an increase in availability of animal protein sources. This situation calls for the production of fast maturing livestock like rabbits which can utilize cheap and locally available feedstuffs (Balogun *et al.*, 2003). Rabbit production is one of the ways to reduce deficiency of animal protein intake in Nigeria (Unigwe *et al.*, 2009). The short gestation period and prolific habit of rabbit makes the animal to have more advantages over other livestock. Rabbit is one of the cheapest meats that can easily fit into the wider segment of the population but has not been fully exploited in Nigeria. The high cost of conventional feedstuff sources (Esonu *et al.*, 2006) and their non-availability due to competition between man and animal has been a serious challenge to rabbit farmer. Therefore, there is the need to investigate alternative feed sources such as, *Azadirachta indica*, which leaves have been used as animal feed in many places. The main purpose of this study is to determine the effect of replacing wheat offal with neem (*Azadirachta indica*) leaf meal on growth performance and carcass characteristics of male growing rabbits.

Materials and Methods

Experimental location: The research was carried out in rabbit section of the Teaching and Research farm of the College of Animal science and livestock production, Federal University of Agriculture Abeokuta, Ogun State. Abeokuta geographical coordinates: 7° 9' 0" North, 3° 21' 0" East (Google Earth 2017).

Source of test ingredient: Fresh neem leaves were harvested from neem trees around the experimental site. The leaves were air dried until it becomes crispy, then the air-dried leaves were milled using commercial milling machine into neem leaf meal (NLM).

Experimental animals, Design and Management: Thirty-six (36) male weaner rabbits, with an initial average weight of 550g, were used in this experiment. The rabbits were assigned to four treatments, each having three replicates in a completely randomized design. The dietary groups involved replacement of



wheat offal with Neem leaf meal at 0, 5, 10 and 15% as shown in Table 1. The rabbits were housed in wooden hutches. Water and feed were given to the rabbit *ad libitum* and general sanitization was done, with proper biosecurity and daily routine management. The study lasted for thirteen weeks.

Table 1: Percentage composition of the experimental diets

Ingredients	Inclusion levels of NLM (%)			
	0	5	10	15
Maize (white)	40	40	40	40
Wheat Offal	15	10	5	0
Rice Husk	17	17	17	17
Neem Leaf Meal	0	5	10	15
Soyabean Meal	23	23	23	23
Oyster Shell	1.5	1.5	1.5	1.5
Bone Meal	3.0	3.0	3.0	3.0
Vitamin/Premix	0.25	0.25	0.25	0.25
Salt (NaCl)	0.25	0.25	0.25	0.25
Total	100	100	100	100
Calculated analysis				
Crude protein (%)	18.01	18.10	18.22	18.27
Crude fibre (%)	10.01	10.19	10.22	10.33
Energy (kcal/kg)	2638.24	2589.84	2541.44	2493.04

Data collection: Growth performance indices (feed intake, weight gain) were taken weekly while feed conversion ratio was calculated by dividing feed intake by weight gain.

Carcass characteristics: On the last day of the experiment, one rabbit in each replicate was selected and starved for twelve hours without feed, so as to reduce the gastro-intestinal tract content of the animal. The rabbits were weighed and slaughtered and the viscera organs were eviscerated. The live weight, carcass weight, dressing weight and the cut parts (Head, Fore limbs, hind limbs, chest, loin, neck, back, tail) and viscera organs (liver, kidney, heart, lung,) were expressed as the percentage of live weight of each animal.

Statistical Analysis: Data obtained were subjected to one-way Analysis of Variance in a Completely Randomized Design, using SAS (2000). Significant means were compared using Duncan's Multiple Range Test of the software package.

Results and Discussion

The effect of neem leaf meal on growth performance of male weaner rabbit is shown in Table 2. The results indicated that the effect of NLM as alternative to wheat offal did not significantly ($p>0.05$) affect the growth response of male growing rabbit. The similarity in growth indices measured across the treatments indicated that the level of antinutritional factors such as terpene and limonoids (Ogbuewu, *et al.* 2011) in neem leaf meal at the level of inclusion were not detrimental to the growth performance of rabbit. This result negates the report of Unigwe *et al.* (2016) who observed significant difference when unsexed rabbits were subjected to the diets containing NLM at the same level of inclusion reported in this present study. The variations in the reports could be attributed to the sex effect because this present study focused only on male growing rabbits.

Table 2: Effect of neem leaf meal on growth performance of male weaner rabbit



Inclusion level of neem leaf meal (%)				
Parameters	0	5	10	15
Initial weight (g)	583.33±9.62	577.78±11.11	577.78±11.11	566.67±0.00
Final weight (g)	1344.44±155.56	1600.00±115.47	1255.56±29.40	1133.33±69.39
Total weight gain (g)	761.11±163.96	1022.22±105.99	677.78±29.40	566.67±69.39
Daily weight gain (g)	8.36±1.80	11.23±1.16	7.45±0.32	6.23±0.76
Total feed intake (g)	5169.44±173.52	6022.22±473.79	4683.33±130.17	4791.11±522.53
Daily feed intake (g)	56.81±1.91	66.18±5.21	51.47±1.43	52.65±5.74
Feed conversion ratio	7.56±1.79	5.94±0.39	6.92±0.12	8.71±1.38

The effect of replacing wheat offal with neem leaf meal on the carcass characteristics of male weaner rabbit is presented in Table 3. The result showed that all carcass weight dressing percentage hind limbs, loin, neck and liver were significantly ($p<0.05$) influenced by neem leaf meal among the measured parameters. The carcass weight, dressing percentage and hind limbs decreased as the level of NLM increased across the treatment groups. The highest value of loin and neck were recorded in rabbit fed 5%NLM diet while the least values were recorded from those fed 15%NLM diet. Rabbits on control and 10%NLM diets had similar values of loin and neck. The liver weights increased ($p<0.05$) with increased levels of NLM. The adverse effect of increased level of neem leaf meal on liver could be as a result of presence of tannin and saponins. Suchitra and Wanapat (2008) reported that neem leaves contain large amounts of tannins (11%) and saponins (2.5%). In ruminants, condensed tannins and saponins may be used to improve rumen ecology but they are detrimental in monogastric species

Table 3: Effect of neem leaf meal on carcass characteristics of male weaner rabbit

Parameter	Inclusion levels of neem leaf meal (%)			
	0	5	10	15
Live weight (g)	1666.67±101.38	1689.67±92.48	1478.67±33.93	1228.33±80.50
Carcass weight (g)	1245.33±70.04 ^a	1244.67±47.81 ^a	1044.33±44.95 ^b	792.33±28.90 ^c
Dressing (%)	74.77±1.03 ^a	73.80±1.43 ^a	70.81±4.45 ^{ab}	64.74±1.78 ^b
Head (%)	9.60±0.19	9.73±0.40	9.25±0.85	9.76±0.63
Fore limb (%)	5.55±0.54	8.06±0.76	6.72±1.43	7.44±0.17
Hind limb (%)	17.01±0.42 ^a	15.59±0.71 ^{ab}	15.99±0.83 ^{ab}	14.61±0.56 ^b
Chest (%)	15.51±0.29	12.11±1.97	12.36±2.21	10.76±1.34
Loin (%)	7.67±0.47 ^{ab}	8.15±0.44 ^a	7.77±0.41 ^{ab}	6.12±0.70 ^b
Neck (%)	1.68±0.03 ^{ab}	2.33±0.23 ^a	1.63±0.25 ^{ab}	1.49±0.17 ^b
Back (%)	15.14±0.44	15.35±1.45	14.24±2.07	12.06±0.89
Tail (%)	0.47±0.04	0.53±0.04	0.54±0.01	0.56±0.02
Liver (%)	1.97±0.12 ^b	2.47±0.31 ^{ab}	2.84±0.10 ^a	2.99±0.11 ^a
Kidney (%)	0.49±0.09	0.55±0.08	0.47±0.04	0.60±0.01
Heart (%)	0.26±0.04	0.28±0.01	0.23±0.03	0.29±0.08
Lungs (%)	0.55±0.06	0.55±0.10	0.51±0.03	0.60±0.05

^{a,b} Means on the same row with different superscripts are significantly ($P<0.05$) different

* Live weight was used as covariate

Conclusion

The study concluded that replacement of wheat offal with neem leaf meal in the diet of growing male rabbits above 5% had negative effect on dressed percentage and liver though the effect was not significantly seen



on growth performance. It was therefore, recommended that the NLM inclusion should not exceed 5% in the diet of male rabbit for optimum performance.

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