Growth performance of weaner rabbits fed graded levels of plantain leaf

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Abstract

The potentials of non-conventional resources are great as they play an important role in alleviating the problem of cost and competition of conventional feed sources for livestock and poultry in Nigeria. This study aimed at investigating the growth performance of weaner rabbits fed graded levels of plantain leaf (PL). Thirty mixed bred rabbits aged 6-8 weeks old with an average weight of 0.70 ± 0.02 kg were randomly allotted to five experimental treatments of three replicates each in a completely randomized design. Treatments consisted of T1 – concentrate alone (control), T2 – T5 had 25g, 50g, 75g and 100g of PL respectively. Proximate composition of the feed were carried out while initial weight, final weight, feed intake, feed conversion and weight gain were measured. Results revealed that the crude protein and crude fibre contents of the concentrate and PL recorded 19.30% and 9.97% vs 0.98% and 8.11% respectively. Initially weight ranged from 0.65kg – 0.76kg. Rabbits on T2 recorded the least final weight (0.98kg) which was similar to those on T4 (1.05kg) and T3 (1.10kg) but lower ($P < 0.05$) than those on T5 and T1 (1.32kg and 1.38kg respectively). Rabbits on T5 recorded the highest intake of PL (83.72g/d) while those on T2 had the least (21.04g/d). Weight gain was highest (0.68kg), for rabbits on T1 but least for those on T2 (0.23 kg). The feed conversion ratio ranged from 4.65 (T1) to 14.85 (T4). Rabbits were able to tolerate the plantain leaf meal up to 100g. In addition, rabbits on 100g/day plantain leaf performed comparably with those on control.

Keywords: Growth, Rabbits, Plantain leaf, concentrate, feed intake

Introduction

An Animal that is deprived of proper nutrition cannot give its best; hence, adequate feeding in terms of its quality and quantity becomes imperative. Rabbits have attracted interest as an economical source of animal protein (Egbo *et al.*, 2001). Topmost in the attributes promoting the production of rabbits includes high fecundity, growth rate and the ability to utilize forages and turn out of low cost/high quality proteins (Biobaku and Dosumo, 2003; Odimba, 2006). Egbo *et al.* (2001) reported that rabbits are efficient converters of feed to meat and utilize up to 30% fibre as against 10% by most poultry species. Forages can act as basal diets of rabbits (Linga and Lukefahr, 2000) although there is improvement in performance of rabbits fed concentrate and forage compared to feeding forage or pellets

alone (Biobaku and Dosumo, 2003; Taiwo *et al.*, 2005). Some conventional forages used for feeding rabbits include *Panicum maximum*, *Pureria phaseloides*, *Centrosema pubesceus*, *Mucuna cochinchinensis* (Aduku and Olukosi, 1990) just to mention a few. Most of these forages are found in abundance in arable farm environments but getting them during the dry season can be a problem thus the investigation on the use of plantain leaves which can withstand the dry season. While the plantain fruit is a valuable foodstuff for human consumption, the waste part of it can be fed to livestock. The fruit wastes (peels), stems and leaves can be utilized as energy sources for livestock and in particular during the dry season when there are feed shortages. However, there is dearth of information on the use of plantain wastes in

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rabbit production. Therefore, this paper examines the performance of rabbits fed graded levels of plantain leaves in terms of growth.

Materials and methods

Experimental site

The experiment was conducted at the rabbitry unit of the University of Uyo Teaching and Research Farm.

Experimental material and diet

Rabbits were bought from a rabbit farmer at Uyo, Akwa Ibom State. The plantain leaves

were harvested from household farms, school farm and fed fresh to the rabbits. A concentrate diet was formulated as shown in Table 1. The five experimental diets consisted of the following:

Treatment 1: 60g concentrates alone

Treatment 2: 30g concentrate plus 25g plantain leaf

Treatment 3: 30g concentrate plus 50g plantain leaf

Treatment 4: 30g concentrate plus 75g plantain leaf

Treatment 5: 30g concentrate plus 100g plantain leaf

Table 1: Composition of concentrate diet

Ingredients	%
Maize	58.00
Soya bean meal	10.00
Wheat offal	10.00
Fish meal	7.00
Bone meal	10.00
Palm kernel cake	1.50
Salt	0.50
Premix	2.50
L -Lysine	0.25
DL - Methionine	0.25
Total	100.00

Experimental animals and design

Thirty mixed bred rabbits of both sexes with ages ranging from 6-8 weeks old were randomly divided into five treatment groups with each replicated three times of two rabbits each. The experiment lasted eight weeks after two weeks of feed and housing acclimatization prior to the data collection. The rabbits were housed under intensive system, using wooden and metallic hutches which were covered with mesh that permitted inspection, ventilation and dropping of faeces on the pan underneath the hutch. In each hutch were feeding and watering troughs which were made of concrete. The sanitation of the rabbit house was maintained. Prophylactic medications were administered against prevalent rabbit infections. The rabbits were fed concentrate

in the morning at 8am and the fresh plantain leaf (chopped to bit sizes) in the evening. For those on control, they were split fed 30g in the morning and 30g in the evening.

Data collection

Before commencement of the growth performance trial, the rabbits were weighed to obtain uniform initial weights across treatments. Thereafter, weekly weights were measured to determine the weights gains. Feed intake was determined by obtaining the difference between the quantity of feed and forage offered and the left over feed offered to the animals. Data generated were used to calculate the body weight changes and feed conversion ratio.

Data analysis and proximate analysis

Data were subjected to analysis of variance according to Snedecor and Cochran (1978), where analysis of variance indicated

significant treatment effects; means were compared using Duncan's New Multiple Range Test as outlined by Obi (1990). Proximate composition of the diets/treatments was determined by the procedure described by AOAC (1995).

Results and discussion

Table 2 shows the proximate composition

(%) of the concentrate diet and fresh plantain leaf on dry matter basis. The dry matter of the concentrate (92.74%) is higher than that of the plantain leaf (36.85%). The crude protein of the concentrate (19.30%) was also higher than that of the plantain leaf. The crude fibre value of the plantain leaf (8.11%) is comparable with that of the concentrate diet (9.97%).

Table 2: Proximate composition of concentrate diet and fresh plantain leaf

Parameters	Concentrate	Plantain leaf
Dry matter (%)	92.74	36.85
Crude Protein (%)	19.30	10.98
Crude Fat (%)	11.11	1.84
Crude Fibre (%)	9.97	8.11
Ash (%)	18.18	13.55
Nitrogen free extract (%)	41.44	65.52
Energy (cal/kg)	3429.50	699.60

The dry matter content of plantain leaf (19.27%) as cited by Aduku and Olukosi (1990) is lower than the value (36.85%) reported here. The crude protein (10.98%), crude fat (1.84%), ash (13.55%) is comparable with 18.21% CP, 1.42% (fat) and 13.72% ash cited by Aduku and Olukosi (1990). The dry matter (92.74%) and crude protein contents (19.30%) of the

concentrate reported in this study compared with 90.13% and 18.12% reported by Oloruntola *et al.* (2015) consisting of maize, wheat offal, groundnut cake, bone meal, premix and table salt. From Table 2, it appears that the concentrate diet possesses a higher nutritive value compared to the plantain leaf. Table 3 shows the growth performance characteristics of weaner rabbits.

Table 3: Growth performance characteristics of rabbits

	T1	T2	T3	T4	T5	SEM
Initial weight (kg)	0.70	0.75	0.70	0.70	0.65	0.11
Final weight (kg)	1.38 ^a	0.98 ^c	1.10 ^{bc}	1.50 ^c	1.32 ^{ab}	0.08
Weight gain (kg)	0.68 ^a	0.23 ^c	0.40 ^{ab}	0.35 ^{ab}	0.67 ^a	0.05
Daily weight gain (g/d)	12.14 ^a	4.11 ^c	7.14 ^{ab}	6.25 ^{ab}	11.96 ^a	0.02
Dry matter intake (g/d)	55.91 ^d	50.38 ^e	72.53 ^c	92.80 ^b	113.10 ^a	12.04
Feed conversion ratio	4.65 ^e	12.26 ^b	10.16 ^c	14.85 ^a	9.46 ^d	2.10
Mortality	16.67	16.67	16.67	0.00	33.33	

abc means on the same row with different superscripts are significantly different (p<0.05)

The final weight for rabbits on T1 (1.38 kg) was comparable to those on T3 (1.32kg respectively) but higher (p<0.05) than those of T3, T2 and T4 (1.10kg, 0.98kg and 1.05kg). This noticeable trend can be seen in weight gain and daily weight gain. The difference in value of final weight gain of rabbits in treatments 1, 2 and 4 indicates

differences in nutritive value and intakes. The altered effect observed in dry matter intake may be as a result of the feed given. Apart from those on T1, other rabbits had two sets of feeds and this enhanced their intakes. However, rabbits on concentrate recorded a higher intake (p<0.05) compared to those on T2 (55.91 g/d vs

50.38 g/d). The reason for this might be that rabbits on T2 were not too familiar with the PL in their diet. The differences in feed intake could also be attributed to taste and fibre content of the feed (Omole *et al.*, 2008) also acceptability. The average daily weight gain in this study is comparable to 7.14 – 12.03 g/d reported by Ekpenyong (1984); Oloruntola *et al.* (2015) in weaner rabbits fed concentrates combined with forages. The final weight reported in this study also compared with 1.07kg – 1.34kg by Oloruntola *et al.* (2015). Banana/plantain leaves cannot meet animal requirements alone, therefore supplementation with nitrogen and energy or its incorporation in a diet containing other feedstuffs and forages are suggested (Ffoulkes and Preston, 1978). Rabbits could be fed up to 40% without negative effects on growth, feed intake and physiology while 60% inclusion rate reduced dry matter intake (Rohilla and Bujarbaruah, 2000). The feed conversion ratio (FCR) is an index of the efficiency of converting unit feed into unit weight gain. There was no trend in the values for FCR. However, rabbits on T1 recorded the least ($p < 0.05$) value of 4.65 while those on T4 had the highest (14.85). Rabbits on T1 had the best value followed by those on T5 (4.65 vs 9.46). The values reported here were higher than those obtained by Oloruntola *et al.* (2015) which ranged between 3.62 and 4.55. This may be attributed to the feed, genetic makeup of the rabbits and environment.

Conclusion

This study has shown that fresh plantain leaves can be incorporated up to 100g/day in diets of weaner rabbits since it promoted growth performance without any side effects.

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