GROWTH PERFORMANCE OF RABBITS UNDER DIETARY MANIPULATION AT DIFFERENT POST WEANING AGES FOR HEAVIER BODY WEIGHTS

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ABSTRACT

This study was conducted to determine the effect of dietary manipulation of growth in rabbits at different post-weaning ages on body weight (BW) at sexual maturity. A diet of 12%CP and 3238 kcal ME/kg was formulated as the control diet while another diet of 16%CP and 2906kcal ME/kg was formulated as the experimental diet. Dietary treatments were as follows: Treatment 1: 16% CP diet given between weaning (4 weeks) and8 weeks of age, Treatment 2:16% CP diet given between8and 12 weeks of age, Treatment 3: 16% CP diet given between 12and 16 weeks of age, and Treatment 4:control diet of 12% CP which was fed from weaning to 24 weeks of age. Besides, forage was also supplied. The BW records from 40 animals (10 per treatment) were collected from weaning to 24 weeks of age. Results showed significant differences in BW of the rabbits from 12 weeks of age onwards, with those in Treatment 2 and Treatment 1 having the highest and the lowest BW, respectively. Results of the study therefore revealed that the adoption of the management practice of manipulating growth through feeding between 8 and 12 weeks of age will result in the production of table size rabbits of 1.464 kg and 1.655 kg at 16 and 20 weeks of age, respectively.

Key words: Rabbit, post-weaning growth, diet.

INTRODUCTION

The meat supply situation in Nigeria remains critical in spite of the large animal population FMEDR(2000). It is also true that enormous investments of money, energy and time have been directed towards research and development efforts in the conventional livestock which has not adequately arrested the shortage. This implies that efforts should be placed on livestock species with short generation interval and high prolificacy and fecundity. One of such high potential source of animal protein is the rabbit, not commonly exploited in Nigeria even though Nigeria is one of the major producing nations in Africa (Lebas *et al.*, 1997). Moreover, the domestic rabbits in Nigeria without the application of breeding programs are generally poor in performance (Umesiobi, 2000). This has prompted rabbit research in Nigeria where studies have reported values ranging from 1483±91 to 1625±76g for rabbit weights at 20 weeks of age(Orheruata and Ekhiogbe, 2009). To be able to attain such weight at much younger age, dietary manipulation of growth studies for heavier weights at younger ages could be useful.

Studies on manipulation of growth at compensatory growth phases have been reported in cattle, sheep, turkey and broilers (Lee and Leeson, 2001;Rozemboim*etal.*, 2004; Halevy *et al.*, 2006). The idea behind manipulation of growth at compensatory growth phase is that the animals are made to maximize their growth at this critical phase of growth, thus allowing the animal to exploit its full genetic growth potential. Orheruata and Ekhoigbe (2009) in their study on evaluating methods of manipulating growth and the time to manipulate the rabbits observed that the feeding pattern exerts the greatest influence and appropriate age of compensatory growth was between 1 and 2 months post-weaning. It is this relatively short period of time that manipulation can be done for maximum effect in rabbits.

This study was therefore carried out to examine the effect of dietary manipulation of rabbits at different post-weaning ages on subsequent body weight.

MATERIALS AND METHODS

Experimental site

The experiment was carried out in the rabbit unit of the University of Benin - Teaching and Research Farm, Benin City, Nigeria, located between latitudes 6ºand 6.30º N of the equator and longitudes 5.40º and 6ºE of the Greenwich Meridian. In the humid rainforest zone of Nigeria, annual temperature ranges between 24.5and 32.7 ºC with a mean value of 27.6 ºC. Annual rainfall ranges from 1498to 3574mm with a mean value of 2162 mm. The relative humidity and daily sunshine are between 63.3 and 81.71% and 5.85 and 7.5 hours with mean values of 72.5% and 6.68hours, respectively (NAA,2010).

Animals, experimental diets and procedures

Forty 28 days old weaned rabbits with average weight of 0.321±0.095kg from heterogeneous population (crosses of New Zealand White, New Zealand Red, Chinchilla, Californian, and Dutch breeds) were sourced from rabbit breeders in Benin City and in the Northern part of Nigeria and randomly allocated to four different dietary treatments (10/treatment).

A diet of 12% CP and 3238kcalME/kg was formulated as the control diet while another diet of 16% CP and 2906kcalME/kg was formulated as the experimental diet. The composition and estimated values of the diets are presented in Table 1. Dietary treatments were as follows: Treatment 1:16% CP diet given between weaning (4 weeks) and 8 weeks of age, Treatment 2: 16% CP diet given between 8 and 12 weeks of age, Treatment 3: 16 % CP diet given between 12 and 16 weeks of age, and Treatment 4: control diet of 12 % CP, which was fed from weaning to 24 weeks of age. The control diet was fed at all other times when the experimental diet was not being fed to 24 weeks of age. In all treatments, forage (a mixture of grasses and legumes: *Panicum maximum, Tridax procumbens, Ipomea batatas* leaves and *Centrosema pubescens*) was made available in the hutch.

Table 1: Composition of the diets.

Feed ingredients (%)	Experimental diet	Control diet
Maize	60.00	84.00
Groundnut cake	16.00	10.00
Palm kernel cake	6.00	2.00
Brewer's dry grain	14.00	
Bone meal	2.50	2.50
Limestone	1.00	1.00
Vitamin premix	0.15	0.15
Salt	0.35	0.35
Estimated composition (%)		
Metabolizable energy (kcal/kg)	2,906	3,238
Crude protein	16.21	12.38
Ether extract	4.4	3.95
Crude fibre	6.87	3.33
Minerals (ash)	2.28	1.56
Nitrogen free extract	57.63	66.70

Individual body weights(BW) were weekly taken from weaning to 24 weeks of age using a 5 kg capacity kitchen scale. Weight data were subjected to analysis of variance using the GLM procedure of SAS (2004) to determine the effects of dietary treatment on BW at different post-weaning ages.

RESULTS

Table 2: Body weights (BW) of rabbits at 8, 12, 16, 20 and 24 weeks of age.

Dietary treatment	BWT8	BWT12	BWT16	BWT20	BWT24
1	0.523	0.615 b	0.960 b	1.200 b	1.255 c
2	0.455	0.952 a	1.464 a	1.655 a	1.872 a
3	0.438	0.775 ab	1.255 ab	1.295 b	1.520 b
4	0.480	0.748 ab	1.295 ab	1.594 a	1.630 b
SEM	*0.031*	*0.043*	*0.115*	*0.042*	*0.050*

abc Means in the same column with different letters are significantly different (P<0.05).

There were significant differences in BW of the rabbits due to dietary treatments from 12 weeks of age onwards, with those in Treatment 2 and Treatment 1 having the highest and the lowest BW, respectively.

DISCUSSION

The adoption of a management practice that will make rabbit meat available at table size will be a boost to the rabbit industry. In the present study, the supplying of a diet richer in CP (16%) from 8 to 12 weeks of age resulted in rabbits with average weight of 1.464 kg and 1.655 kg at 16 and 20 weeks of age respectively. Rabbits manipulated earlier than 8 weeks of age did not perform well even though Orheruata *et al.*(2010) observed that to improve body weight of rabbit, the initial growth phase of the rabbit should be exploited. The current study agrees with the findings of Orheruata *et al.* (2009) whose work on selecting for higher growth rates in rabbits raised in the rainforest zone of Nigeria using a Stochastic approach reported that manipulation of rabbit should be done at 11or 13 weeks of age. Therefore, the low performance of those manipulated immediately after weaning is not surprising and could be due to the underdeveloped digestive system of the rabbits for concentrates and roughages. Those manipulated at older ages were lighter than those done at 8-12 weeks of age. The body weights at 16 and 20 weeks of age obtained in this study were higher than those reported at the same ages (1.077 and 1.324 kg, respectively)for rabbits raised in Nigeria (Taiwo *et al.*,2005; Orheruata *et al.*,2010).

In conclusion, results of this study reveal adoption of management practices for manipulating growth through diet between 8 and 12 weeks of age increased the body weight of rabbits to a table size of 1.464 kg or 1.655 kg at 16 weeks and 20 weeks of age, respectively.

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