

EFFECT OF FEEDING GRADED LEVELS OF SWEET POTATO (*Ipomoea batata*) LEAVES ON BODY WEIGHT OF RABBITS

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ABSTRACT

The study was conducted to evaluate the effect of graded levels of sweet potato (*Ipomoea batata*) leaves (SPL) and pelletized concentrate feed (PCF) on growth performance (body weight and body weight gain). Thirty-six weaner rabbits comprising eighteen (18) bucks and doe each were used for the experiment. The rabbits were randomly assigned to three dietary treatments in a Completely Randomized Design. Twelve (6 males and females each) rabbits were assigned to each treatment and replicated three times such that each replicate was allocated 4 (2 males and 2 females) rabbits. Rabbits in treatment 1 were fed solely on concentrate. However, rabbits in treatment 2 were fed 50 percent concentrate and sweet potato leaves while those in treatment 3 were fed 100 percent sweet potato leaves. Data were collected on body weight and body weight gain. Data collected were subjected to one-way analysis of variance of the SPSS statistical package. The results obtained indicated that rabbits fed 100 percent concentrate and sweet potato leaves had significantly ($P < 0.05$) higher body weight and body weight gain compared to those fed combined (50:50) concentrate and sweet potato leaves. Based on the findings of this study, feeding rabbits with 100 percent concentrate and 100 percent sweet potato had better growth performance of the rabbits.

Keywords: Body weight, feeding, sweet potato, leaves, rabbits

INTRODUCTION

The increasing demand for animal protein necessitates the need to intensify livestock production. In developing countries such as Nigeria, there is insufficient animal protein intake due to low productivity of the livestock as a result of inadequate protein intake in their diets (Abu *et al.*, 2008). Feed supply has remained a major constraint in animal production due to increasing cost of conventional feedstuffs, occasioned by the competition between man and animal for available sources of protein (Amaefule *et al.*, 2004). Rabbits are efficient converters of feed to meat and are capable of utilizing up to 30% crude fibre, which promotes intestinal mobility, as against 10% by most poultry species. Adewolu (2008) emphasized the need for leaf meals in animal diet particularly rabbits as a possible means of reducing cost of animal feed. Sweet potato (*Ipomoea batata*) is an herbaceous creeper plant which resists drought, has short generation interval of about four months, and can therefore be planted twice a year; hence, its availability and usage as feed for rabbits throughout the year is not in doubt (Hong *et al.*, 2003). The leaves of this plant have been used in the tropics as a cheap protein source in ruminant feeds probably as a result of its high protein contents. In many developing countries, the interest is now focused on exploring alternative feed source for animals. Protein underutilized legumes and forages are used as animal feed due to an acute shortage of food rich in protein, caused by population explosion, thereby leading to high cost of animal protein. Forages' leaves and seeds are of great interest due to the high nutritional value and low cost. The leaves of sweet potato have been used in the tropics as a cheap protein source in ruminant feeds probably as a result of its high protein contents. Therefore, the objective of the study was to evaluate the effect of graded levels of sweet potato (*Ipomoea batata*) leaves (SP) and pelletized concentrate feed (PCF) on growth performance of rabbits.

MATERIALS AND METHODS

The study area

The study was conducted at the Teaching and Research Farm, Department of Animal Science, Faculty of Agriculture, Nasarawa State University, Keffi, Shabu-Lafia Campus. The study area is located in the guinea savanna zone of North Central Nigeria, and found on latitude 08° 33' N and longitude 08° 32' E (Timveh *et al.*, 2022).

Source of sweet potato vines

Sweet potato vines (SPV) used in this study were obtained from a farm located within Lafia. The SPV were harvested fresh daily and fed to the rabbits with the commercial pelletized concentrate feed (PCF).

Experimental animals and design

A total of fifty-four (54) weaner rabbits made up of three breeds (Chinchilla, New Zealand White and Dutch) were procured from the National Veterinary Research Institute (NVRI) Vom, Jos, Plateau State, Nigeria and used for the experiment. Each breed consisted of 18 (9 males and 9 females) rabbits. The animals were housed in well cleaned and disinfected hutches with dimensions of 70 x 60 x 50cm each. During this period, they were dewormed with Endovet® (Ivermectin) at the dose of 0.3 mg/kg subcutaneously and also treated prophylactically against coccidiosis with Amprole 200® according to the manufacturer's prescription. After quarantining, the rabbits were randomly assigned in a completely randomized design (CRD).

Data Collection

Body Weight: Live body weights were measured on arrival using sensitive electronic scale and then at weekly intervals afterwards until 6 days after the commencement of the study.

Body Weight Gain: Average daily gains (ADG) were estimated on weekly basis using the formula:

$$\text{Body weight gain} = \frac{W_2 - W_1}{N}$$

Where W_2 is the final weight

W_1 is the initial weight

N is the number of days taken from initial weight to the present weight.

Statistical Analysis

The data on the body weight and body weight gain were subjected to Analysis of Variance (ANOVA) using SPSS package (version 21) and significant means were separated using Duncan's Multiple Range Test (Duncan, 1995). All statements of significance were based on the 0.05 level of probability.

The linear model employed was:

$$Y_{ij} = \mu + T_i + e_{ij}$$

Y = individual mean observation

μ = general mean of the population

T_i = treatments effect

e_{ij} = random error

RESULTS

Effect of feeding graded levels of sweet potato (*Ipomoea batata*) leaves on body weight of rabbits is presented in Table 1. Utilization of sweet potato leaves had significant ($P < 0.05$) effect on weekly body weight except at week 0 which marked the commencement of the experiment. Rabbits fed 100 percent concentrate and 100 percent sweet potato leaves had higher body weight compared to those fed 50 percent concentrate +50 percent sweet potato leaves. Table 2 shows the effect of feeding graded levels of sweet potato (*Ipomea batata*) leaves on body weight of rabbits. Sweet potato leaves had significant ($P < 0.05$) effect on body weight gain at weeks 0-1 and 1-2. Rabbits fed 100 percent concentrate and 100 percent sweet potato leaves had higher body weight gain compared to those fed 50 percent concentrate +50 percent sweet potato leaves concentrate and sweet potato leaves. However, as from week 2 up to week 6 of the experiment, graded level of sweet potato leave had no significant ($P > 0.05$) effect on body weight gain of the rabbits.

Table 1: Effect of sweet potato (*Ipomoea batata*) leaves on body weight of rabbits

Body Weight	100% Conc.	50%conc+50%SP	100%SP	P-Value
Week 0	435.47±3.20	420.95±4.55	430.23±3.83	0.096 ^{NS}
Week 1	526.66±4.59 ^a	445.95±15.42 ^b	529.29 ±10.08 ^a	0.001*
Week 2	577.8±10.03 ^a	456.56±8.96 ^b	562.38±7.76 ^a	0.000*
Week 3	607.14±9.21 ^a	529.26±18.70 ^b	635.24±6.24 ^a	0.003*
Week 4	632.86±10.10 ^a	570.25±14.03 ^b	658.71±8.97 ^a	0.004*
Week 5	660.24±10.22 ^b	592.38±5.25 ^c	694.76±7.22 ^a	0.000*
Week 6	701.66±10.37 ^a	641.19±14.42 ^b	720.71±3.66 ^a	0.004*

^{ab} = values within the same row with different superscripts are significantly different, T= treatment, 100% Conc. =100% Concentrate, 50%conc+50%SP =50% and 50% sweat potato leaves, Concentrate, 100%SP =100% sweat potato leaves, NS = not significant, * = significant at 5% probability

Table 2: Effect of sweet potato (*Ipomoea batata*) leaves on body weight gain of rabbits

Body weight gain	100% Conc.	50%conc+50%SP	100%SP	P-Value
Week 0-1	91.19±7.62 ^a	25.00±10.00 ^b	99.047±9.37 ^a	0.002*
Week 1-2	51.19±12.07 ^a	10.59±2.49 ^b	33.09±2.92 ^{ab}	0.022*
Week 2-3	29.28±1.79	72.71±27.47	72.86±13.93	0.218 ^{NS}
Week 3-4	25.71±3.11	40.97±29.55	23.47±5.10	0.752 ^{NS}
Week 4-5	27.38±1.90	22.143±10.00	36.048±13.82	0.629 ^{NS}
Week 5-6	41.42±7.84	48.80±17.50	25.95±3.83	0.401 ^{NS}

ab = values within the same row with different superscripts are significantly different, T= treatment, 100% Conc. =100% Concentrate, 50%conc+50%SP =50% and 50% sweat potato leaves, Concentrate, 100%SP =100% sweat potato leaves, NS = not significant, * = significant at 5% probability

DISCUSSION

The significant effect of feeding graded level of sweet potato leave on body weight of rabbit as observed in this study agrees with the report of Bamikole *et al.* (2005) who investigated the potential of using Mulberry leaves (*Morus spp*) in rabbit production in a 12-week trial. These authors observed that Mulberry leaves incrementally replaced concentrated diet by 0, 25, 50, 75 and 100%, and reported that the growth performance of Mulberry leaves increased significantly with increasing level of mulberry leaves in the diets. The higher body weight demonstrated by rabbits fed 100% concentrate and sweet potato leaves is an indication that the rabbits being a monogastric has fully developed caecum for digestion of roughages. This is an indication that the rabbits have developed ability to handle fibrous feed. This finding strongly agrees with the report of Adeyemo *et al.* (2014) who studied the effect of concentrate to forage (*Tridax procumbens*) ratio on the performance and carcass characteristics of growing rabbits. The authors also reported that the rabbits fed 50% forage had the highest live weight, dressed weight and dressing percentage which is different in the current study where those fed 100% concentrate and sweet potato leaves had higher performance. Bamikole *et al.* (2005) reported that weight gain of rabbits on diets containing 25 and 50% mulberry leaves were not significantly different from that of all-concentrate ration, but these were significantly higher than those fed 75 and 100 % mulberry leaves. Similarly, Farinu *et al.* (2008) evaluated the nutritive potential of pigeon pea (*Cajanus cajan*) grain and leaf meals on growth performance of pre-pubertal rabbits in the tropics and reported that final live weight, daily weight gains and feed conversion ratio values were not significantly affected by the dietary treatments.

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