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Effect of *Tridax Procumbens* on Growth Performance Parameters of Buck Rabbits

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Abstract. The effects of *Tridax procumbens* on buck rabbits' growth performance parameters were investigated. Forty-eight (48) buck New Zealand White rabbits of 16–18 weeks of age and weighing 1260-1305g were used in the study. The rabbits were randomly assigned to four treatment groups: T_1 (control), T_2, T_3 and T_4 contained (200g, 300g and 400g), of *Tridax procumbens* (*T. procumbens*)/kg of diet, respectively. The animals were pre-conditioned for I week after which animals were fed their experimental diets for 8 weeks. Animals on all dietary treatments had similar ($P > 0.05$) average daily feed intake (ADFI). However, animals on the positive control groups: T_2, T_3 and T_4 had significant ($P < 0.05$) better average daily gain (ADG) compared to the T_1 group of animals with the T_4 group showing the best ADG. Similarly, animals on the T_2, T_3 and T_4 dietary groups had significant ($P < 0.05$) better feed efficiency (FE) compared with the T_1 group with the T_4 group showing the best or most superior FE. It was concluded that dietary inclusion rate of 400g of *T. procumbens*/kg of diet best supports buck rabbit growth performance parameters.

Key words: Growth performance parameters, *Tridax procumbens*, Buck rabbits

Introduction

Rabbits are among the several species of farm animal involved for meat production, including Nigeria. Rabbits are prolific-providing meat animal with high nutritive value of protein. Some outstanding attributes that promote rabbit production include fast growth rate and ability to utilize forages efficiently. Rabbits have a short gestation period, early sexual maturity and ability to rebreed several times within a year (Sharp *et al*., 2007). Despite these numerous advantages, rabbit production has not achieved its full potential as cheap animal protein source (Herbert & Adejumo, 1995). Adequate nutritional treatment has been used for improving growth and reproductive efficiencies of livestock, including the rabbit (Abdel-Azeem, 2010).

Recently, there has been interest in the utilization of *Tridax procumbens* as a protein source for livestock (Makkar & Becker, 1997). *Tridax procumbens* leaves have quality attributes that make it a potential ingredient in partial replacement for soybean meal or fish meal in non-ruminant diets. The *Tridax procumbent* plant has been reported to have high nutritional, medicinal and therapeutic qualities (Fahey, 2005). *Tridax procumbens* can easily be established in the field as it has good coppicing ability, as well as good potential for forage production. Different parts of the *Tridax procumbens* plant contains a profile of important minerals, are good sources of protein, vitamins (beta-carotene, tocopherol) and various phenolic (Anwar *et al*., 2007) most of which can enhance growth and reproductive performances. From these standpoints therefore, *Tridax procumbens* may be useful in improving the growth rate and feed efficiency of buck rabbits. Therefore, the objectives of this study are to determine the efficacy of *Tridax procumbens* on feed intake, growth rate and feed efficiency in buck rabbits.

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Materials and Methods

Experimental Site

This study was carried out at the rabbitry section of the Teaching and Research Farm, Department of Animal Science, Rivers State University, Port Harcourt, Nigeria.

Animals and Management

Prior to the introduction of the experimental rabbits to the experimental site, the hutches, feeding and water troughs, including the floor were thoroughly washed with detergent and water and allowed to dry for one week. These were done to ensure a 'pathogen free' environment for the animals before rabbits were brought into their hutches. Forty-eight buck New Zealand White rabbits of 16 to 18 weeks of age and weighing 1260 -1305 gram were used in the trial. Animals were pre-conditioned to their new environment for one week and were similarly managed prior to presenting them with their experimental diets. There were 12 rabbits per treatment with 3 replications of 4 rabbits per replicate. Rabbits were procured from a commercial producer in Port Harcourt, Rivers State.

Experimental Procedures

Feed intake was closely monitored. At the beginning of each day of the experimental period if there was any left over from the previous day, it would be collected, air-dried, weighed and recorded. The difference between dry feed delivered and the next day's orts represents the actual feed intake for the day. On the last day of study, all animals were weighed again. The difference between the final and initial body weight represents weight gained during the study period. Average daily feed intake (ADFI), average daily gain (ADG) and feed efficiency (FE) for the study period were computed. The study duration was 8 weeks.

Experimental Diets

Pfizer grower mash feed supplemented with *Tridax procumbens* was used in the study. Four levels of *Tridax procumbens* were used resulting to four experimental diets as: Treatment 1 (T_1) contained no *Tridax procumbens* and served as the control diet. Treatment 2 (T_2) contained 200g of *T. procumbens*/kg of diet. Treatment 3 (T_3) contained 300g of *T. procumbens*/kg of diet and Treatment 4 (T_4) contained 400g of *T. procumbens*/kg of diet. Animals received their respective experimental diets for 8 weeks. At the end of trial, animals were re-weighed to obtained their final body weights.

Experimental Design and Statistical Analysis

The design used was the completely randomized design (CRD). Data obtained were subjected to analysis of variance (ANOVA) using the general linear model (GLM) procedure of SAS. The experimental model is: $Y_{ij} = \mu + D_i + E_{ij}$; where Y_{ij} = the observation, μ = overall mean common to all treatments, D_i= the effect of the i^{th} diet and E_{ij} = the error term. Treatment means were compared using Tukey's test and an *α-level* of *0.05* was used for all statistical comparisons to detect significance.

Results

The results of the growth performance parameters of the four dietary treatment groups are shown in Table 1.

Table 1. Mean feed intake, growth rate and feed efficiency of buck rabbits fed graded levels of dietary *Tridax procumbens*

Treatments						
Parameter	T_1	T_2	T_3	T_4	SEM	*P-value*
ADFI (g)	87.78	88.12	87.51	86.88	3.74	1.81
ADG (g)	17.26^a	19.28^b	21.42^c	22.12^c	0.95	0.04
FE (ADG/ADFI)	0.21^a	0.23^b	0.26^c	0.27^d	0.02	0.04

Note: ^{abcd}Means within each row with different superscripts are significantly ($P < 0.05$) different.

There were no significant ($P > 0.05$) differences amongst treatment groups in the ADFI as ADFI were similar for all treatment groups. However, despite the lack of differences in the ADFI, significant ($P < 0.05$) differences were observed in the ADG. Animals in the T_2, T_3 and T_4 groups gained at a better rate than the control (T_1) group with the T_4 group showing the best ADG rate. FE mirrored ADG as animals in the positive control groups significantly ($P > 0.05$) again demonstrated improved FE over the T_1 group, respectively with the T_4group showing the best FE.

Discussion

Animals in all the dietary treatment groups readily consumed their respective diets without any signs of feed rejection. This is an indication that *T. procumbens* is not appetite-depressing. In the past antibiotics had been used at sub-therapeutic levels to improve animal performance characteristics, particularly animal growth rates and feed efficiency (NRC, 2012). However, since the advent of the ban of the use of antibiotics in the diets of animals, animal producers and other stakeholders have been strategizing for alternatives to the use of antibiotics.

At present, rabbits are species of micro-livestock used in meat production. Rabbits are very prolific in the provision of meat with high nutritive protein value. Other advantages associated with rabbits are their fast growth rate and ability to effectively utilize forages. They also have short gestation period, early sexual maturity and ability to rebreed several times in a year (Sharp *et al*., 2007). Adequate nutrition of the animal is very fundamental for optimum growth of the animal. Various plants have been employed as feed additives or as a supplement in improving livestock performances, including *T. procumbens* (Fahey, 2005).

In this present study, the additions of *T. procumbens* did not negatively affect feed intake suggesting that *T. procumbens* is not appetite-suppressing as the feed intake of the negative control was similar with those of the positive control treatment groups. This however was not surprising since the animal were of similar age and body weight at the beginning of the study. Although feed intakes were similar between the negative and positive control treatment groups, rabbits of the positive control groups gained weight at a better rate compared with animals of the negative control group. For instance, while the rabbits of the negative control group gained about 17.26g per day animals on the positive control groups gained about 19.28g, 21.42g and 22.12g per day, respectively. These translate into about 12%, 24% and 28%, respectively of an enhanced growth rates of the T_2, T_3 and T_4 groups over the T_1 group. This finding in this study is in tandem with the data of Ogbuewu *et al.* (2009).

Again, the feed efficiency values obtained in this current study mimicked the pattern of growth rate. To this point, while the T_1 FE was 21%, those of T_2, T_3 and T_4 were 23%, 26% and 27%, respectively. These also translate into extra feed efficiencies of about 10%, 24% and 29%, respectively for T_2, T_3 and T_4 group over the T_1 group. This finding is this present study is in agreement with those of Nuhu (2010). It has previously been speculated that for animals to grow optimally, their diets should be adequately fortified with micro-nutrients particularly

vitamins (NRC, 2012). *T. procumbens* has been shown to be rich in vitamins and therefore would have contributed to the improved growth and feed efficiencies of the *T. procumbens*-containing diets.

Conclusions

Dietary *T. procumbens* improves animal growth rate and feed efficiencies, especially at the inclusion rate of 400g/kg of diet. Therefore, its use should be employed to enhance rabbit production.

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