Nig. J. Anim. Prod. 2020, 47(2):76 - 81
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Nigerian Journal of Animal Production

Performance of weaner rabbits fed forage supplemented with local spices

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Abstract

Chemical composition of spices revealed that they have the potential to enhance forage utilization by rabbits. A study was conducted to evaluate the performance of weaner rabbits fed forages supplemented with spices (curry, utazi, uziza and scent leaf). This study lasted for 56 days. Five treatment diets were formulated: diet 1 (control without spice), diet 2 (curry), diet 3, (utazi), diet 4 (uziza) and diet 5 (scent leaf) with the same percentage inclusion respectively. Thirty weaner rabbits were randomly allocated to the treatment diets with six rabbits per treatment and two per replicate in a Completely Randomized Design. Feed and water were provided to the weaner rabbits ad libitum. There were no significant differences (P>0.05) in the growth parameters except in the feed intake while the organ proportion and carcass cut part of rabbits fed the treatment diets showed significant differences (P<0.05) in all the cut parts measured. However, rabbits fed forage supplemented with curry, utazi, uziza and scent leaf were significantly different (P<0.05) among the treatments in all the organ proportions measured. The spleen of weaner rabbits fed forage supplemented with curry, utazi, uziza and scent leaf were significantly (p<0.5) than that of diet 1 (control) which indicates higher antibody production in the body of rabbits fed diets containing spices to fight against any toxin associated with spices since spleen is the major source of lymphocytes responsible for defense. From the findings in this study, it could be concluded that rabbits fed local spices especially curry and utazi did better and therefore are recommended in weaner rabbits diets for better performance.

Keywords: Performance, forage, weaner rabbit, local spices

Introduction

Animal protein has been in short supply in developing countries including Nigeria. The advantages of rabbit production as a means of addressing protein needs of man include high growth rate, high quality but cheap protein and high fecundity. This can be attributed to their short gestation period, early sexual maturity, high prolificacy and ability to rebreed after parturition, all lead to short generation intervals (Lebas *et al*., 1986). In spite of all these attributes, rabbit production is still very much unpopular in Nigeria compared to other livestock species. There is therefore the need to create more awareness and improve the production and management of rabbits. This can help provide a reliable source of animal protein for the teeming population (Onunkwo *et al.,* 2019). The use of spices in forages will enhance the utilization of forages and address the problem of poor utilization of forages since forages are said to be unpalatable, coarse and less acceptable to farm animals and chemical composition of spices revealed that they have the potential to enhance forage utilization by rabbits (Okwu, 2001). The profit of rabbit farming mainly depends on economic feeding of balanced, cheap and quality diets. Hence, the aim of this study is to evaluate the performance of weaner rabbits fed forages supplemented with local spices (curry, utazi, uziza and scent leaf).

Materials and methods

Location of study

The study was conducted at the Rabbitry Unit of the Teaching and Research Farm of the Michael Okpara University of Agriculture, Umudike, Abia State. Umudike is located on latitude 05 ^{0}C 28' North and 07 ^{0}C 32'East and lies at an altitude of 122 m above sea level. This area is situated within the tropical rainforest zone of West Africa which is characterized by long duration of rainfall (April - October) and short period of dry season (November-March). Average rainfall is 2169.8mm in 148 – 155 rain days. Average ambient temperature is 26 ^{0}C with a range 22 ^{0}C and 30^{0}C. Its relative humidity ranges from 50 to 90%. These meteorological data were obtained from the meteorological station at the National Root Crops Research Institute, Umudike Abia State (NRCRI, 2019)

Experiment animals and management

Thirty weaner rabbits, (Chinchilla C Dutch) with average weight of 380g each were procured from Rivers State Agricultural Development Programme (ADP). The animals were randomly assigned to the 5 treatments diets with 2 rabbits per replicate in an experiment that lasted for eight weeks. The weaner rabbits were housed two per hutch. The hutch was placed inside a well-ventilated rabbitry unit, with a concrete floor and asbestors roofing sheets. The dimension of the hutch was 60cm by 50cm by 30cm. The hutch was covered with a wire netting, which ensures easy collection of feed refused and cleaning of the faeces. The hutches were washed and disinfected before the animals moved into them.

Experimental diets

Concentrate diet (Table 1) was formulated and used in combination with spices and forages to constitute the five experimental diets as shown below:

Diet 1 (control): concentrate + *Panicum maximum* + *centrosema pubescence*

Diet 2: concentrate + *Panicum maximum* + *centrosema pubescence* + curry leaf

Diet 3: concentrate + *Panicum maximum* + *centrosema pubescence* + utazi leaf

Diet 4: concentrate + *Panicum maximum* + *centrosema pubescence* + uziza leaf

Diet 5: concentrate + *Panicum maximum* + *centrosema pubescence* scent leaf

Table 1: Ingredients and nutrient composition of experimental diet

Ingredients (%)	Concentrate
Maize	57.00
Soya bean meal	20.00
Fish meal	2.00
Bone meal	3.00
Palm kernel cake	15.75
Oyster shell	1.00
Palm oil	1.00
Vit/min premix	0.25
Total	100
Nutrient composition	
Crude protein (CP) (%)	18.27
Crude fibre	10.85
Metabolizable energy (ME) (kcal/kg)	2413.74

Data collection and analysis

The weaner rabbits were weighed on arrival prior to the commencement of the experiment. The weights were subsequently taken weekly; water was given *ad libitum* in all hutches. The respective diets with varying local species were weighed out, feeds were supplied once a day, and all precautions were taken to guard against feed wastage and were increased as the rabbits feed consumption increased with their growth. Every morning, the feeds were weighed and the leftovers were also recorded. The average daily weight gain and feed intake were calculated and recorded at the end of the week and mortality record was also kept. At the end of the experiment, one rabbit from each replicate were selected from each of the 5 treatment diets for carcass evaluation. The animals were weighed before slaughtering, scalded, so as to remove the furs. The internal organs of the rabbits were removed, the head, neck trotters were also removed. The dressed weight was determined and used in calculating the dressed weight percentage. The cut parts (fore and hind limbs) were determined in order to calculate the percentage cut parts. The internal organs were weighed, and the result was used to determine the organ proportion. The data collected were subjected to analysis of variance (ANOVA) and the means separated using Duncan multiple range test according to Steel and Terrie (1980).

Results and discussion

The results of performance of weaner rabbits fed forage supplemented with local spices is shown in Table 2. With the exception of feed intake there was no significant difference ($P>0.05$) in the values obtained for the other parameters of rabbits fed the treatment diets. Average daily feed intake of rabbits fed diet 2, 3 and 4 were not significantly different from one another. However, rabbits fed diets 2 and 3 had significantly ($P<0.05$) higher feed intake than that of diets 1 and 5 respectively, with the exception of diets 5, the feed intake of rabbits fed the other diets (2,3 and 4) were higher than that of those fed the control diet. This implies that the spices increased the appetite of the rabbits leading to greater fed intake than the diet without species (diet 1, control). This is in agreement with the reports of Adeniyi and Balogun (2002) and Okoye and Ugwuene (2006). Though there were no significant difference ($P>0.05$) in the final weight and weight gain of the rabbits fed all the treatment diets, but final and weight gain of the rabbits fed diets (2, 3 and 5) were numerically greater than that of diet 1 (control). From the findings of this study, it could be concluded that rabbits fed spices especially curry (T2) and utazi (T3) did better than others in terms of feed intake and weight gain.

Table 2: Growth performance of weaner rabbits fed diet supplemented with local spices

Parameters	T1	T2	T3	T4	T5	SEM
IBW (g/b)	412.50	475.50	434.50	462.50	435.75	145.6
ADFI (g/b/d)	174.00^{d}	282.00^{a}	276.00^{a}	246.00^{b}	208.00^{c}	0.14
FBW (g/b)	915.00	1265.00	1310.00	797.50	1275.00	145.5
AWG(g/b)	502.50^{c}	789.50^{b}	875.50^{a}	335.13^{d}	839.25^{a}	12.30
ADWG (g/b/d)	8.97^{c}	14.09^{b}	15.63^{a}	5.98^{d}	14.98^{b}	0.63
FCR	19.39^{b}	20.01^{b}	17.65^{c}	41.13^{a}	13.88^{d}	0.33
Mortality	12.49	12.49	8.30	12.49	12.49	3.35

a-b-c Means with different super scripts in the same row are significant different ($p<0.05$), S.E.M: Standard Error of mean. IBW=Initial Body Weight, FBW=Final Body Weight, AWG=Average Weight Gain, ADWG=Average Daily Weight Gain, ADFI=Average Daily Feed Intake, FCR=Feed Conversion Ratio.

The results of the carcass cut-parts of weaner rabbits fed forage supplemented with local spices is presented in Table 3. There was significant difference (P<0.05) in all the cut-parts evaluated.

However, the breast, forelimb, hand-limb and back of rabbits fed diets 2,3,4 and 5, respectively were significantly higher (P<0.05) than that of control diet 1, with fore limb and hind limb of rabbits fed diets 4 (uziza) being the highest. This shows that rabbit fed diets containing spices generally did better than those fed diet 1 (without spices).

Table 3: Carcass cut parts of weaner rabbits fed diet supplemented with local spices

Parameters	T1	T2	T3	T4	T5	SEM
Dressed weight (%)	38.72^{b}	23.48^{b}	36.32^{a}	32.30^{b}	33.75^{a}	2.13
Neck (%)	3.26^{b}	4.62^{a}	3.09^{b}	3.68^{b}	3.59^{b}	0.16
Breast cut (%)	5.90^{a}	6.46^{d}	7.01^{c}	7.20^{b}	8.31^{a}	0.05
Fore limb (%)	13.30^{a}	15.70^{d}	17.05^{c}	28.76^{a}	22.22^{b}	0.05
Hind limb (%)	26.40^{e}	30.60^{d}	34.50^{c}	40.31^{a}	38.45^{b}	0.12
Back out (%)	31.65^{d}	36.00^{c}	38.75^{b}	43.38^{a}	43.38^{a}	0.13

a-b-c Means with different super scripts in the same row are significant different (pfi 0.05), S.E.M: Standard Error of mean.

The results of the internal organ proportion of rabbits fed forages supplemented with local spices is presented in Table 4. There were significant differences (P<0.05) in the values of all the organs evaluated. The organs of rabbits fed the diets containing local spices may have efficiently handled any anti-nutritional factor associated with the spices (Frandesy, 1981). However, the spleen of rabbits fed diets 2-5 were significantly higher (P<0.05) than that of diet 1 indicating that there was higher antibody production in the body of rabbits fed diets 2-5 containing spices to fight against any toxin associated with spices since spleen is the major source of lymphocytes responsible for body defense (McDonald *et al.*, 1995). This also was reflective in the result of mortality where there was no significant difference (P<0.05) in most of the diets.

Table 4: Internal organ proportions of weaner rabbits fed diet supplemented with local spices

Parameters	T1	T2	T3	T4	T5	SEM
Heart (%)	2.03^{a}	2.31^{a}	2.20^{a}	2.59^{a}	1.48^{b}	0.016
Kidney (%)	7.42^{a}	7.00^{a}	7.32^{a}	4.78^{d}	3.77^{c}	0.022
Liver (%)	2.79^{b}	5.63^{a}	5.10^{a}	2.77^{b}	2.22^{b}	0.022
Lungs (%)	5.15^{b}	5.58^{b}	8.90^{a}	5.81^{b}	4.58^{c}	0.052
Spleen (%)	4.58^{d}	8.58^{b}	6.55^{c}	9.20^{a}	6.34^{c}	0.016
Intestine (%)	23.42^{d}	26.31^{c}	26.79^{b}	27.28^{a}	24.51^{d}	0.018

^{abcd} Means on the same row with different superscripts are significantly (p<0.05) different. SEM = Standard error of mean

Conclusion

It could be concluded from the findings of this study that rabbits fed diets containing local spices (diets 2-5) did better than those fed diet 1 (without spices) in the growth and carcass performance. Spices therefore can be used as additives in the diet of weaner rabbits. Among these spices, curry and utazi (diets 2 and 3) were preferred since rabbits fed these spices did better in terms of feed intake and weight gain. It is therefore recommended that the spices especially curry and utazi be used as additives in the diet of weaner rabbits to achieve food

performance.

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Received: 16th September, 2019
Accepted: 17th January, 2020