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Response of Weaner Rabbits to Concentrate Supplemented with Varying Levels of *Syndrella nodiflora* Forage

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Abstract: A ten-week feeding trial was conducted to evaluate the effect of feeding varying levels of forage *(Syndrella nodiflora)* on the performance, haematology, and serum chemistry of twenty-four weaner rabbits. Six rabbits each were assigned to each dietary treatment (A, B, C and D) in three replicate groups of two rabbits each, in a completely randomized design (CRD). Performance data of weaner rabbits reflect that average final live weight, weight gain, feed intake and feed conversion ratio were significantly ($P<0.05$) higher in rabbits fed diets B and C than those on diets A and D (0 and 75% supplement). All the heamatological and serum chemistry indices assayed were not significantly ($P>0.05$) affected by the dietary treatments. Therefore, *Syndrella nodiflora* can be used to supplement rabbit diets up to 50% to enhance performance without any adverse effect.

Key words: Rabbits, *Syndrella nodiflora*, supplementation, concentrate

Introduction

In spite of the various attributes of rabbits over other live stocks, the cost of production has become a nightmare to local farmers due to the ever increasing cost of concentrate feeds. In view of this, the need to develop alternative feeding materials that are cheap, readily available and with great potentials in supporting livestock growth has become imperative. Consequently, researchers are diverting attention to rabbit's natural habit of high forage intake. Although, rabbits can be produced on forage alone, but production can be improved by the addition of other feed supplements (Biobaku *et al.*, 2003). Rabbits fed 50% level of *Stylosanthes* hay with concentrate gave similar performance to those on sole concentrate diet (Bamikole and Ezenwa, 1999). Similarly, Sanni *et al.* (2005) evaluated the economics of producing grower rabbits fed different combinations of concentrate and *Stylosanthes* and found that 50:75 combination gave the highest return on investment, thus the cost of feeding grower rabbits could be lowered by supplementing concentrate diet with *Stylosanthes*. Taiwo *et al.* (2004) recorded a higher weight gain and better conversion efficiency in rabbits fed a mixed feeding regime of *Tridax procubens* with concentrate than those on sole concentrate diet.

This study was therefore undertaken to test the effect of supplementing concentrate diet with *Syndrella nodiflora* forage on the performance, haematology and serum chemistry of weaner rabbits.

Materials and Methods

Experimental Site: The experiment was conducted at the Ambrose Alli University Ekpoma Livestock Teaching and Research Farm.

Table 1: Percentage composition of concentrate diet

Ingredients	(%)	
Maize	60.00	
Soyabean meal	15.50	
Fish meal	1.00	
Palm kernel cake	10.00	
Wheat offal	22.00	
Bone meal	2.50	
Oyster shell	1.50	
Premix (min. & vit.)	0.25	
Salt	0.25	
Total	100.00	
Calculated analysis		
Metabolizable energy (Kcal/g)	2.57	
Crude protein (%)	18.00	
Crude fibre (%)	14.00	
Determined analysis	concentrate	*S. nodiflora*
Metabolizable energy (Kcal/g)	2.57	2.75
Crude protein (%)	17.96	22.32
Ether extract (%)	5.21	4.39
Nitrogen free extract (%)	62.90	43.09
Ash (%)	7.93	15.80
Crude fible (%)	6.00	14.40
Dry matter (%)	95.00	9.05

Source of ingredients: The fresh forage (*S. nodiflora)* was harvested daily within the vicinity of the experimental site. The harvested forage was rinsed with water and chopped along with the stem before being fed to the experimental animals. Ingredients for the formulation of the concentrate ration were purchased in Benin city, Nigeria.

Experimental diets: At the commencement of the trial, the chemical composition of the forage were carried out by the method of (AOAC, 2000). Four treatment diets (1, 2, 3, and 4) were formulated. Diet 1 contained 100% concentrate + 0% forage, while diets 2, 3, and 4 were

Table 2: Performance of rabbits fed the dietary treatments

	Inclusion levels of *S.nodiflora* forage (%) + concentrate				
	0	25	50	75	
	Diets				
Parameters	1	2	3	4	SEM±
Average initial weight (g)	675.00	663.33	670.00	690.00	-
Average final body weight(g)	1450.00^{b}	1488.88^{a}	1500.00^{a}	1400.00^{c}	10.00
Average weekly weight gain (g)	77.50^{b}	82.47^{a}	83.00^{a}	71.00^{c}	7.49
Average daily weight gain (g)	11.07^{b}	11.78^{a}	11.86^{a}	10.14^{c}	0.18
Average forage intake (g)	0.00	11.85^{c}	23.87^{c}	31.33^{a}	0.08
Concentrate intake (g)	46.32^{a}	36.05^{b}	24.38^{c}	12.40^{d}	0.02
Average total feed intake (g)	46.32^{a}	47.95^{a}	48.25^{a}	43.73^{a}	0.84
Feed conversion ratio	4.18^{b}	4.07^{c}	4.07^{c}	4.31^{a}	0.07

abcd: Means in the same row with varying superscripts differ significantly (P<0.05). SEM: Standard error of mean

Table 3: Haematlogy and serum chemistry of rabbits fed the dietary treatments

	Inclusion levels of *S.nodiflora* forage (%) + concentrate				
	0	25	50	75	
	Diets				
Parameters	1	2	3	4	SEM±
PCV (%)	41.00	40.00	39.00	33.00	3.50
Hb (g/dl)	13.67	13.33	13.00	11.00	0.16
RBC (x10^{6}/ml)	6.50	6.50	6.40	6.30	0.05
MCV (fl)	63.02	61.54	60.94	552.38	0.95
MCH (pg)	21.03	20.51	20.31	17.46	0.07
MCHC (%)	0.33	0.33	0.33	0.33	-
WBC (x10^{6}/ml)	58.00	57.00	57.00	54.00	2.80
Total protein (g/dl)	58.00	55.00	55.00	50.00	0.87
Globulin (g/dl)	33.00	33.00	32.60	29.00	1.09
Albumin (g/dl)	25.00	22.00	22.40	21.00	0.02
SGOT (I.μ/l)	8.00	7.80	7.50	6.60	0.15
SGPT (I.μ/l)	7.05	7.00	6.85	6.00	0.08

formulated by supplementing diet 1 with 25, 50, and 75% forage *(Syndrella nodiflora)* respectively, (Table 1).

Experimental design: Twenty four weaner hybrid rabbits (Chinchilla X New Zealand white) with average initial weight range of 663.33 to 690.00g were allocated on weight equalization basis into four treatment groups (A, B, C, and D) in a completely randomized design (CRD) with three replicates per treatment. The rabbits were fed the dietary treatments *ad libitum*, throughout the experimental period of ten weeks. Before the commencement of the experiment, the hutches, feeders and drinkers were washed and disinfected. Fresh cool water, and oral anti-stress were administered to the animal on arrival. Routine management and medication were carried out.

Haematological analysis: On the last day of the feeding trial, one rabbit from each replicate was randomly selected. A set of blood samples were collected via neck slit into ethylene diammine tetraacetate (EDTA) labeled bottles for haematological determination, using Baker and Silverton (1985) method. Another set of blood samples were collected into heparinised bottles for biochemical indices determination (Monica, 1987).

Performance study: During the feeding trial, daily feed intake and weekly weight changes were recorded, while weight gain and feed conversion ratio were estimated to measure responses.

Statistical analysis: Data collected were subjected to a one-way analysis of variance (Steel and Torrie, 1990), while significant means were separated using Duncan's multiple range test with the aid of SAS (1999) package.

Results and Discussion

The performance of rabbits on the dietary treatments as shown in Table 2 reflects that average final live weight, weight gain, feed intake and feed conversion ratio were significantly (P<0.05) better in rabbits fed diets B and C than those on diets A and D (0 and 75% supplement). Numerically, the average daily feed intake increased as the level of forage in the diet increases from 0% to 50% inclusion, but there was no significant (P>0.05) variations amongst the treatment groups (A, B, and C). Similarly, feed conversion ratio was significantly (P<0.05) better in rabbits fed diets B and C (25 and 50% forage supplements), followed by those on the concentrate diet (0% *S. nodiflora*) and poorest in 75% *S. nodiflora* supplement. This observation is in agreement

with the reports of Onwudike (1995) and Ironkwe (2004), which stated that a mixed feeding regime comprising concentrate and forage promotes better growth rate than sole concentrate or forage diet.

Results on the haematological and serum chemistry indices showed that packed cell volume (PCV), heamoglobin (Hb), red blood cell (RBC), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular heamoglobin concentration (MCHC), total protein, albumin, globulin, serum glutamate oxaloacetatic transaminase (SGOT) and serum glutamate pyruvic transaminase (SGPT) were not significantly ($P>0.05$) influenced by the dietary treatments (Table 3). The non significant variation in the haematological parameters of rabbits amongst the treatment groups indicate the quality of the test diets. This observation supports that of Sokunbi and Egbunike (2000) who reported non significant influence of neem leaf meal on the heamatology and serum chemistry of pullets. However, all the heamatological and serum chemistry values obtained in this study are within the normal range of haematological standards as established by Monica (1987). This suggests that all the rabbits irrespective of the treatment diets had normocytic and normochronic red cell, meaning that the supplementation of *S. nodiflora* up to 75% did not affect iron utilization in the rabbits and hence they did not suffer normocytic anaemia.

Conclusion: The results point to the fact that the performance of weaner rabbits could be improved by supplementing concentrate diet with up to 50% *Syndrella nodiflora* forage without any alteration to their blood profiles.

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