

Short Communication

Nutritive value of *Stylosanthes guianensis* and *Lablab purpureus* as sole feed for growing rabbits

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Accepted 26 July, 2007

The objective of this study was to evaluate the nutritive value of *Stylosanthes guianensis* and *Lablab purpureus* as sole feed for growing rabbit. Thirty-six cross-bred growing rabbits of mean weight $515 \pm 2.3\text{g}$ were used for the study. The animals were randomly allotted to 3 different treatments. The animals in T₁ were fed *S. guianensis* only, while animals in T₂ and T₃ were fed solely on *L. purpureus* and sunflower leaf (control), respectively. Feed intake and weight gain were measured on daily and weekly basis respectively. The results showed that rabbits fed *S. guianensis* and *L. purpureus* compared favourably with those fed sunflower leaf in terms of feed intake, weight gain and feed conversion ratio. The results also revealed that the nutrients digestibility (dry matter, crude protein and crude fibre) were also better in rabbit fed *S. guianensis* and *L. purpureus*. The dressing percent, lung weight, heart and kidney weight were not affected by the dietary treatment.

Keywords: Dressing percent, *Lablab purpureus*, rabbits, *Stylosanthes guianensis*, weight gain

INTRODUCTION

Rabbit is a micro-livestock that requires small space for production. It has short generation interval (Cheeke, 1984). The meat is tasty and contains high protein content with low cholesterol level and it could be started on small or large-scale (Omole et al., 2005). One of the major factors affecting livestock production in Nigeria is availability of quality feed at affordable price. Rabbits could utilize forages unlike poultry (Asuquo, 1997); they are pseudo-ruminant. Rabbit can be maintained on green leaves alone without the supplementation of concentrate, but for the best growth to be achieved by rabbits, forage has to be supplemented with concentrate feed. Alfalfa has been used as sole or in combination with other ingredients with high daily weight gain up to 35 g. Cheeke et al. (1983) evaluated the performance of rabbits on Alfalfa and some tropical legumes such as *Desmodium distortum*, *Cassipourea* and *Clitoria ternate*, and the results were impressive.

Stylosanthes is a forage legume that is grown for fresh

feed, hay and commercial leaf meal production. It has been used as plant protein source for pigs, ducks and chicken in China (Guptan and Singh, 1983). *Lablab purpureus* is leguminous plant that has been used to feed sheep, cattle and goat (Babayemi et al., 2006). Sunflower leaf is one of the common feed for rabbit in Nigeria. The objective of this study was to determine the effect of feeding growing rabbit solely on *Stylosanthes guianensis* and *L. purpureus* on growth, feed conversion ratio, carcass analysis and nutrient digestibility.

MATERIALS AND METHODS

Experimental design

The experiment was conducted at the Rabbitary Unit of the Institute of Agricultural Research and Training, Moor Plantation, Ibadan which is located in the rain forest belt of South-Western Nigeria. The rabbits were reared in a wooden cage of 12 compartments. Each compartment had a dimension of 0.5 x 0.5 x 0.5 m³. The legs of the cage were placed inside a container containing used engine oil in order to prevent soldier ants' infestation.

Thirty-six cross-bred growing rabbit of mean initial weight of 518.2 g were used for the trial. Completely randomized design was

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Table 1. Chemical composition of *Stylosanthes guianensis*, *Lablab purpureus* and Sunflower foliages (% dry matter).

Parameter	<i>S. guianensis</i>	<i>L. purpureus</i>	Sunflower
Dry matter	19.75	23.40	21.28
Crude protein	19.91	18.18	16.41
Crude fibre	13.28	15.36	16.53
Ether extract	1.34	1.23	2.34
Ash	9.38	8.94	7.26
Nitrogen free extract	56.03	56.29	57.46

Table 2. Summary of performance of growing rabbits fed *S. guianensis*, *L. purpureus* and sunflower.

Parameters	<i>S. guianensis</i>	<i>L. purpureus</i>	Sunflower	± SEM
Initial weight	516.38 ^a	515.29 ^a	519.28 ^a	25.15
Final weight	1231.89 ^a	1118.75 ^b	1124.38 ^b	15.3
Total weight gain	715.51 ^a	603.46 ^b	605.10 ^b	8.94
Monthly weight gain	238.50 ^a	201.15 ^b	201.70 ^b	4.9
Total feed intake	3527.43 ^a	3204.30 ^b	3219.12 ^b	15.1
Monthly feed intake	1175.81 ^a	1068.11 ^b	1073.04 ^b	10.50
Feed conversion ratio	4.93 ^b	5.31 ^a	5.32 ^a	0.21
Survivability	100	100	100	-

Means with different superscripts along the same row are significantly different ($p < 0.05$).

used for the trial. The trial consisted of 3 treatments ($T_1 - T_3$) and each treatment was replicated 4 times with 3 rabbits per replicate. Rabbits in T_1 were fed solely on *S. guianensis* while in T_2 and T_3 , the rabbits were fed leaves of *L. purpureus* and sunflower, respectively.

Analyses

The initial weight of the rabbits was taken at the beginning of the feeding trial and subsequently at interval of one week with a weighing balance. Feed intake was taken on daily basis by deducting the leftover feed from feed given. Feed conversion ratio was also calculated.

The digestibility trial was carried out at the end of 12 weeks. Four rabbits were randomly selected from each treatment and housed individually. Faecal and urine were collected on daily basis, weighed and stored inside refrigerator. Seven days were used for the collection. At the end of seven days, the faecal was bulked for each animal for proximate analysis and the urine was bulked for nitrogen analysis.

For carcass analysis, four rabbits were randomly selected from each treatment. The rabbits were starved overnight before slaughtering. The fur was removed by scalding. The dressing percent was calculated as the ratio of dressed weight to live weight. Organs like kidneys, lung, liver and heart were removed and weighed individually.

Chemical composition of the *S. guianensis*, *L. purpureus* and sunflower and the faecal and urine sample were carried out according to A.O.A.C. (1990). All data were subjected to statistical analysis of variance and Duncan Multiple Range Test was used to separate the means (SAS, 1998).

RESULTS AND DISCUSSION

The results of chemical composition revealed that the

crude protein of *S. guianensis*, *L. purpureus* and sunflower was high while their crude fibre also was high (Table 1). *S. guianensis* had low dry matter compared to *L. purpureus* and sunflower thus indicating that *S. guianensis* is more succulent than *L. purpureus* and sunflower. There were significant differences in the mean monthly feed intake of the rabbits ($P < 0.05$). Rabbit fed *S. guianensis* gained more weight than those fed *L. purpureus* and sunflower ($P < 0.05$). No significant difference was observed in *L. purpureus* and sunflower ($P < 0.05$) (Table 2). There were significant differences in the mean monthly weight of the rabbit fed test diets ($P < 0.05$). The highest weight gain was recorded in rabbits fed *S. guianensis* ($P < 0.05$). The weight gain was relatively the same in rabbit fed *L. purpureus* and sunflower ($P > 0.05$).

In Nigeria sunflower leaf is commonly used to feed rabbit and with the result obtained in this trial, the mean feed intake and weight gain, rabbit could be fed with either *S. guianensis* or *L. purpureus*. The mean daily weight gain observed in this trial was lower than 20 g/day reported by Lukefahr and Cheeke (1991) and this could be due to quality of the formulated feed used. It must be noted that rabbit in this study was fed solely on the forages. The highest weight gain reported in *S. guianensis* could be due to high protein content coupled with low fibre content compared to *L. purpureus* and sunflower.

The efficiency of feed utilization was better in rabbit fed *S. guianensis* than those fed *L. purpureus* and sunflower ($P < 0.05$), thus buttressing the fact that *S. guianensis* and *L. purpureus* could be used to feed rabbit instead of sun-

Table 3. Digestibility of nutrients by rabbits fed *S. guanensis*, *L. purpureus* and sunflower leaves.

Parameters	<i>S. guanensis</i>	<i>L. purpureus</i>	Sunflower	± SEM
Dry matter	78.4 ^a	76.9 ^{ab}	73.8 ^b	3.8
Crude protein	69.5 ^a	68.7 ^a	67.9 ^a	2.5
Crude fibre	67.8 ^a	65.4 ^{ab}	63.3 ^b	2.9
Ash	71.5 ^a	70.4 ^a	69.3 ^a	2.8

Means with different superscripts along the same row are significantly different (p<0.05).

Table 4. Carcass analysis of rabbits fed *S. guanensis*, *L. purpureus* and sunflower.

Parameters	<i>S. guanensis</i>	<i>L. purpureus</i>	Sunflower	± SEM
Live weight (g)	1228.32 ^a	1119.82 ^b	1121.05 ^b	21.92
Fur weight (g)	83.5 ^a	71.45 ^b	71.74 ^b	5.21
Dressed weight (g)	908.71 ^a	815.34 ^b	817.81 ^b	15.13
Dressing (%)	73.98 ^a	72.8 ^a	72.95 ^a	3.28
Liver weight (g)	26.29 ^a	24.15 ^a	24.56 ^a	2.8 ^a
Heart weight (g)	4.91 ^a	4.70 ^a	4.60 ^a	0.25

flower. No mortality was recorded during the course of the feeding trial as observed in Table 2. Moreover, *Lablab purpureus* have been used to feed broiler chicken, cattle, sheep and goat with proven good results which did not have any adverse effect on the health status of the animal (Babayemi et al., 2006; Odunsi et al., 2006).

The nutrients (crude protein, crude fibre, ether extract) digestibility were better in rabbits fed *S. guanensis* compared to those fed *L. purpureus* and sunflower (Table 3). The better nutrients digestibility observed in rabbits fed *S. guanensis* could be as a result of high feed intake, low crude fibre content of *S. guanensis* compared to others and succulent nature of *S. guanensis* compared to *L. purpureus* and sunflower. It has been reported that crude fibre content, dry matter feed intake and crude protein of the diet have effect on nutrients digestibility (Arthur, 1975; Schiere, 1999). The results of carcass analysis (Table 4) revealed that the dressing percent, liver weight, dung weight and heart weight were not significantly affected by the dietary treatments. The dressing percent reported in this study was relatively similar to that of Awosanya and Akinyode (2000) and Orumuyi et al., 2006.

In conclusion, *S. guanensis* and *L. purpureus* compared favourably in term of feed intake, weight, feed conversion ratio, nutrients digestibility and carcass analysis to widely common rabbit feed, sunflower leaf. The two leguminous plants are hereby recommended for farmer to cultivate for feeding rabbit.

REFERENCES

- Arthur EC (1975). Feed and Feeding. Animal Nutrition Textbook. Williams and Robins Publisher, New York, pp. 112–118, 205–213.
 Association of Official Analytical Chemist, AOAC. (1990). Official Methods of Analysis, 13th Edition, Washington, D. C.

- Asuquo BO (1997). Nutritional potentials of ipomea, *Centrosema pueraria*, Emilia and Tridax forages in mixed feeds for weaner rabbits. Niger. J. Anim. Prod. 24(1): 46–50.
 Awosanya BA, Akinyode MA (2000). Treatment effect of leucaena Leaf meal on the carcass characteristics of Rabbits, Niger. J. Anim. Prod. 27(1): 90–94.
 Babayemi OJ, Ajayi FT, Taiwo AA, Bamikole MA, Fajimi AK (2006). Performance of West African dwarf goats fed *Lablab purpureus*, *Leucaena leucocephala* and *Gliricidia sepium* foliages. Niger. J. Anim. Prod. 33: 102-111
 Cheeke PR, Harris D, Patton NM (1983). Utilization of tropical forages and alfalfa meal by rabbits (Abstract). Nutri. Abst. Rev. Series B53: 812.
 Cheeke PR (1984). Rabbit Nutrition and Feeding: Recent advances and future perspectives. J. Appl. Rabbits Res. 7(1): 31–37.
 Guptan BN, Singh RB (1983). Chemical composition and nutritive value of *Stylosanthes guyanensis* (HBK) hay (Abstract). Nutr. Abst. Rev. Series 53: 28.
 Lukefahr SD, Cheeke PR (1991). Rabbit Project development strategies in subsistence farming systems: 2. Research applications. World Rev. 69: 26-35.
 Odunsi AA, Ige OA, Sodeinde FG, Akinlade JA, Afon OA (2006). Growth and carcass yield of finishing broiler chickens fed lablab leaf meal. Niger. J. Anim. Prod. 33(2): 203-208
 Omole AJ, Omueti O, Ogunleke O (2005). Performance characteristics of weaned rabbits fed graded levels of dry cassava peel fortified with soybean residue. J. Agric. Environ. 4: 36-38.
 Orumuyi M, Bawa GS, Musa RM (2006). Performance of weaner rabbits fed graded levels of sun-dried sweet potato tuber meal (*Ipomea batatas*) diets. Niger. J. Anim. Prod. 33(2): 186–191.
 Schiere JB (1999). Backyard rabbit farming in the Tropics. Agrodox Publications, Third Edition, pp. 7–8.