MLP -06

Growth Performance of Growing Rabbits Fed Horse Grass and Calapo Mixed Forages

U.K. Ozuo, S.N. Ukachukwu and M.O. Okpara
Department of Animal Nutrition and Forage Science, Michael Okpara University of Agriculture, Umudike
Corresponding author: M.O. Okpara; E-mail: morganokpara@gmail.com

Abstract
Thirty six growing rabbits (mean body weight [BW] = 0.86kg ±0.04) were used to investigate the effect of Horse grass (*Andropogon tectorum)* and Calopo (*Calopogonum mucunoides)* mixed forages on growth response of rabbits in a completely randomized experimental design (CRD) with three replications and each replicate having two (male and female) rabbits. Five treatment (T) diets were formulated to contain 60% Horse grass + 40% Calopo (T_1), 70% Horse grass + 30% Calopo (T_2), 80% Horse grass + 20% Calopo (T_3), 90% Horse grass + 10% Calopo (T_4) and 100% Horse grass (T_5). The trial lasted for 56 days.Results showed that feed intake ranged from 78.75g DM/day for 80:20 grass:legume combination to 90.30 DM/day for 70:30 grass-legume combinations.However, the 70:30 combination had the highest weight gain (10.23g/day) and feed intake (90.30g/day) while sole grass (T_5) produced the least live weight (7.94g/day). Treatments 1, 2 and 4 were higher for dressing percentage. Forage combination of 70% Horse grass and 30% Calopo with low concentrate supplementary diet (50g) could be efficiently utilized and tolerated by growing rabbits without any deleterious effect on performance.

Keywords: Carcass,feed intake, organ weights, performance, weight gain

Introduction

Optimum production has not been sustained when rabbits are raised solely on forages or concentrate (Iyeghe-Erakpotobor, 2007; Iyeghe-Erakpotobor and Mohammad, 2008). However, cases of positive effects of raising rabbits solely on forages have been reported by Phimmasan *et al.* (2004) although negative effect in terms of weight loss was reported by Bamikole and Ezenwa (1999). Various researchers have reported high nutritive value of some other legumes such as *Leucaena leucocephala* (Oduozo and Adegbola, 1992), *Gliricidia sepium* (Gohl, 1981), *Centrosema pubescens* (Raharjor*et al.,*1988), *Puerariaphaseoloides* (Yono*et al.,* 1986; Raharjo *et al.,* 1988),*Cajanus cajan* (Oduozo and Adegbola, 1992).

Relatively few studies have been made on the comparative study of the nutritional value of horse grass and Calopo forages in rabbits. Hence, this study was undertaken to evaluate the performance of growing rabbits fed two mixed forages.

Materials and Methods

The study was conducted at the Rabbit Unit of the Teaching and Research Farm of Michael Okpara University of Agriculture, Umudike, Nigeria. Umudike falls within the rainforest zone of Nigeria with an average annual rainfall of about 1220mm distributed over eight months (March to November) with its peak in June and July and dry spell usually August. It has a humid climate and temperature that ranges from 28^0C in the wet season to slightly over 35^0C in the dry season.The study was conducted with thirty-six (36) growing (New Zealand white x Dutch strains) rabbits (mean body weight [BW] = 0.86kg ±0.04). They were of both sexes and randomly assigned to 5 treatment diets in a completely randomized design (CRD). Each treatment was replicated 3 times with each replicate having 2 (male and female) rabbits. The rabbits were housed in a 3-tier rabbit cage, which had a total of 15 hutches at 5 hutches per tier. The cage was located inside a building equipped with vents and windows for ventilation. Each hutch (100 cm x 40 cm x 40 cm), which accommodated the 2 rabbits, was partitioned with a wooden board and wire mesh and fitted with aluminum drinkers, feeders (15 cm x 10 cm x 10 cm) and an aluminum tray for collection of faeces.

Five dietary treatments consisting of freshly harvested forageswere fed in the following order and designated as treatments 1(60% Horse grass + 40% Calopo), 2 (70% Horse grass + 30% Calopo), 3(80% Horse grass + 20% Calopo), 4 (90% Horse grass + 10% Calopo) and 5 (100% Horse grass).The study lasted for 8 weeks (56 days) during which the rabbits were fed concentrate and forage diets *ad libitum*. The rabbits were weighed at the start of the experiment and subsequently on a weekly basis. Parameters measured were growthperformance, carcass and organ weights.

Forages were analyzed for proximate composition using the methods of AOAC (2000). All data collected were subjected to analysis of variance (SAS, 2008). Differences between the treatment means were separated using Duncan's New Multiple Range Test at 5% level of significance.

Results and Discussion

The proximate composition of the experimental diets is presented in Table 1. Horse grass and Calopo contained 10.45 and 12.00% crude protein (CP) respectively. The performance of rabbits is presented in Table 2 and 3. The daily weight gain, daily feed intake as well as feed conversion ratio, were not significantly ($p>0.05$) affected by the dietary treatments. While the percentage dressed weight of rabbits on diet 4 (writhe the contents) was significantly higher, liver, kidney, heart, lungs and spleen were significantly ($p<0.05$) affected by dietary treatments.

Table 1: Proximate composition (% DM) of various forages fed to growing rabbits

	DM	CP	CF	EE	ASH	NFE
Horse grass	27.33	10.45	10.00	4.10	7.00	68.45
Calopo	30.67	12.00	10.00	5.70	7.00	75.20

The CP content obtained in this study for Calopois similar to the values reported by Ugwuene and Ojewola (2009). A nonsignificant increase in weight gain of rabbits observed in this study agrees with the report of Iyeghe-Erakpotobor *et al.* (2002) who fed varying levels (100, 75, 50, 25%) of concentrate and forage (groundnut haulms, lablab and mucuna) to growing rabbits. Nworgu *et al.* (1999) however, reported significant differences in daily weight gain of weaned rabbits fed varying levels of concentrate, Cynodon and Centrosema combinations (6.71 – 10.13g/day) and the all-concentrate control (19.22g/day). These differences in weight gains could be the type of rabbits used (weaners, 5 – 8 weeks old or growers 9 -15 weeks old), type of forage used, state of forage used (fresh forage or hay) and the environmental conditions (Iyeghe-Erakpotobor and Muhammad, 2008). Feed conversion ratio follows a similar trend with the values obtained by Iyeghe-Erakpotobor *et al.* (2006). The authors attributed their poor feed conversion ratio to the high fiber content of the feed combinations.

Table 2: Growth performance of rabbits fed diets containing Horse grass and Calopo mixed forages

Parameters	T1 (60:40)	T2 (70:30)	T3 (80:20)	T4 (90:10)	T5 (100:0)	SEM
Intake (g/day) as fed						
Horse grass	71.91	99.84	88.41	119.84	129.37	-
Calopo	66.03	55.08	27.62	1.06	-	-
Concentrate	50.00	50.00	50.00	50.00	50.00	-
Total	187.94	204.92	166.03	186.67	179.37	6.93^{ns}
Intake (g DM/day)						
Horse grass	19.65	27.29	24.16	32.75	33.36	-
Calopo	20.25	16.89	8.47	5.16	-	-
Concentrate	46.12	46.12	46.12	46.12	46.12	-
Total	86.02	90.30	78.75	84.03	79.48	0.44^{ns}
Initial weight (kg)	0.90	0.85	0.81	0.91	0.87	0.04^{ns}
Final weight (kg)	1.41	1.49	1.37	1.53	1.37	0.04^{ns}
Weight gain (g)	505.56	644.44	555.45	616.67	500.11	24.62^{ns}
Daily weight gain (g)	8.03	10.23	8.82	9.79	7.94	0.39^{ns}
FCR	10.71	8.83	8.93	8.58	10.01	0.99^{ns}
PER	2.98	2.50	2.39	2.35	2.78	0.18^{ns}

abc: means along the same row with same superscripts are not significantly different ($p>0.05$); * significant; ns : not significant; SEM: standard error of mean

The dressing percentages recorded in this study are in close conformity with the percentages reported by Biya *et al.* (2006) who evaluated the effect of different concentrate-forage feeding systems on the carcass

characteristics of rabbits. The liver and kidney weights obtained in the present study are higher than the values reported by Biya *et al.* (2006). On the contrary, Okeke *et al.* (2009) obtained higher values for liver (5:00 – 7.50%) and kidney (4.60 – 5.00%) than weights reported in this experiment. The observed increase in liver, kidney, heart and lung weight might be due to increased activity of these organs which are actively involved in the metabolism of carbohydrates and proteins in the diets (Bawa *et al.,* 2007).

Table 3: Carcass characteristics of rabbits fed diets containing Horse grass and Calopomixed forages

Parameters	T1 (60:40)	T2 (70:30)	T3 (80:20)	T4 (90:10)	T5 (100:0)	SEM
Dressed (%)	51.60^{a}	51.44^{a}	46.62^{b}	51.85^{a}	49.93^{ab}	15.63^{ns}
Liver (%)	5.12^{b}	5.54^{ab}	6.64^{a}	5.14^{b}	5.55^{ab}	0.21^{*}
Kidney (%)	1.24^{b}	1.12^{b}	1.70^{a}	1.39^{ab}	1.68^{a}	0.08^{*}
Heart (%)	0.47^{b}	0.49^{b}	0.82^{a}	0.41^{b}	0.63^{ab}	0.05^{*}
Lungs (%)	1.42^{b}	1.89^{ab}	2.12^{a}	1.77^{ab}	1.52^{ab}	0.10^{*}
Spleen (%)	0.04^{d}	0.05^{cd}	0.06^{bc}	0.07^{ab}	0.08^{a}	0.00^{*}

abc: means along the same row with same superscripts are not significantly different (p>0.05); * significant; ns : not significant; SEM: standard error of mean

Conclusion

It could be concluded that forage combination of 70% Horse grass and 30% Calopo could be efficiently utilized and tolerated by growing rabbits without any deleterious effect on performance.

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