

Effect of tropical forages on growth performance and carcass quality of rabbits

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Introduction

Rabbit (*Oryctolagus cuniculus*) is a small mono-gastric animal which has a very small body size and an efficient reproductive ability. Backyard rabbit keeping supplies additional protein with low investment and labor inputs. Rabbit meat has many nutritional benefits which include high protein, low cholesterol and high palatability (Samkol and Lukefahr, 2008). The major problem with rabbit production is high feeding cost (Lebas *et al.*, 1997). Feeding cost for rabbits account more than 75% of total cost of production. At present there is a competition for protein sources between man and animals (Jiya *et al.*, 2011). Rabbits are herbivores and can be successfully raised on diets with low in grains and high in roughage. Therefore tropical legumes can be used as an alternative for fed rabbits. The objective of this study was to determine the growth performance, carcass quality of weaner rabbits with diet containing forage supplements and commercial layer pellet.

Methodology

The experiment was carried out at Uva Wellassa University, Badulla. Sixteen (16) weaned cross bred rabbits, mixed sexes were used for the feeding trial which conducted for 45-days. All rabbits selected which were born on same day, a few from same litter. Rabbits were grouped according to Complete Randomized Block Design (CRBD) with four replicates, 2 males and 2 females for each diet group. Ration for all the diets were formulated according to the nutritional requirement of grower rabbit. Maximum inclusion levels for the selected leaves also considered. All animals were kept for an adaptation period during the adaptation period rabbits were fed with only the control diet (Prima layer pellet) with fresh guinea grass (*Panicum maximum*). The experimental diet was introduced gradually for 8 days. Water was supplied ad-libitum for each rabbit. Guinea grass (*Panicum maximum*), Erythrina leaves (*Erythrina indica*), Cassava leaves (*Manihot esculenta Crantz*) and Leucaena leaves (*Leucaena leucocephala*) were harvested from the surrounding environment of the university premises. Guinea grass was harvested one week before feeding to the animals and hay was made by keeping under sun. Erythrina leaves, Cassava leaves and Leucaena leaves were harvested three to four days before feeding rabbits. Those harvested leaves were chopped and wilted until constant weight was gained. Wilted leaves and dried grass were stored under dry condition. Diet 1 = Only layer pellet 100% (control), Diet 2 = Layer pellet 70%, *Erythrina indica* 20%, *Panicum maximum* 10%, Diet 3 = Layer pellet 65%, *Manihot esculenta Crantz* 20%, *Panicum maximum* 15% and Diet 4 = Layer pellet 92%, *Leucaena leucocephala* 7%, *Panicum maximum* 1%. Data were collected on body weight and weight gains, feed intake and Feed Conversion Ratio (FCR).

Two rabbits (one male and one female) from each group were slaughtered for carcass quality evaluation. After 45 days of feeding trial two rabbits (one male and one female) from each treatment group was slaughtered. Hot carcass weight, pH, Length of carcass, dressing percentage was evaluated under carcass quality parameters. Chemical composition of carcasses was analyzed for proximate constituents according to AOAC, 2002 method. Sensory evaluation of boiled meat samples were evaluated using 15 semi trained panelists.

Collected data was analyzed using Analysis of variance (one way ANOVA and two way ANOVA) - Minitab 16 statistical software package. Analysis of variance followed by a mean separation procedure using Tukey's test. Sensory analysis was done by using non parametric analysis of Friedman test.

Result and discussion

Table 01. Performance of rabbits fed experimental diets

Performance characteristics	Diet groups			
	Control (T1)	Erythrina (T2)	Cassava (T3)	Leucaena (T4)
Initial body weight (g)	1981.5 ^a	2062.0 ^a	1818.5 ^a	1836.5 ^a
Final body weight (g)	3108.8 ^a	2900.5 ^a	2903.0 ^a	3144.3 ^a
Daily weight gain (g/head)	25.62 ^a	19.06 ^b	18.97 ^b	29.72 ^a
Feed conversion ratio	0.2135 ^a	0.1588 ^b	0.1580 ^b	0.2477 ^a

a, b: Values in the same row with different letters are significantly different at $p < 0.05$.

Growth performance of rabbits fed diets with various forages is presented on Table 01. However, significant ($P < 0.05$) differences was observed in the values of daily weight gain with rabbits in treatment 3 having the highest weight gain, could be as a result of high crude protein content in the diet. It is recommended that for good performance of rabbits, doe or buck, 10% leucaena leaves blended with their feed is good (Lamidi and Akilapa, 2013). Therefore diet containing Leucaena may have provided the required proteins and amino acids for the growth of the rabbits. With respect to FCR, it was observed that significantly ($p < 0.05$) higher in the rabbits on fed with diet 4 (0.247) than the other diet groups while diet 3 produced the poorest FCR (0.158) compared to the average. The results were similar to the findings of Okonkwo *et al.* (2010). In addition, the feed conversion ratio recorded in this experiment is poorly compared to the normal feed conversion ratio of rabbits (3:1).

All carcass quality parameters were not significantly different with each other ($p < 0.05$) (Data not shown). Treatment 4 showed highest dressing percentage among other treatments. Except treatment 3 other results for dressing percentages were similar to the findings of Chisova *et al.*, (2013) which dressing percentage ranged from 55.56 % to 59.72 % for growing rabbits. Lowest dressing percentage in treatment 3 may be due to toxic compounds containing in cassava leaves.

Sensory results showed that *Erythrina indica* incorporated diet fed rabbits meat was much preferred than others. Results of sensory evaluation were same for both male and female rabbits.

When consider proximate composition of rabbit meat, Crude protein content was varying between 81.2 to 88.3 % (dry matter basis). Results were differ when consider male and female animals. There is a less variation in fat content of both male and female animals regarding four diets (6.2% - 7.1%). Results of fat and moisture content were similar to the findings of Zotte (2002).

Conclusion

Smaller herbivores can persist on small quantities of food on the condition that the plants are of high nutritional quality. Supplementation of concentrate with forage in the diet of rabbits is cost effective. *Leucaena leucocephala*, *Manihot esculenta* Crantz and *Erythrina indica* forages can be included in rabbit's diet with recommended levels without any adverse effect. Sensory results showed that *Erythrina indica* incorporated diet fed rabbits meat was much preferred than others.

Carcass quality evaluation proved that *Leucaena leucocephala* incorporated diet fed rabbits had highest dressing percentage which showed high weight gain. But proximate composition of rabbit meat was not showed a high variation regarding four diets.

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