

MON -12

Evaluation of Four Brands of Commercial Growers Mash on Growth Performance and Carcass Characteristics of Growing Rabbits in the Semi-Arid Region of Nigeria

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Abstract

A study was carried out with twenty eight rabbits of mixed sexes (Dutch x New Zealand White) to evaluate the effect of four brands of commercial growers mash on growth performance and carcass characteristics. They were divided into four (4) treatments and each treatment contain seven (7) replicates and were subjected to Complete Randomized Design (CRD). The growers mash were designated as Hybrid feed (T1), Vital feed (T2), Top feed (T3) and Livestock feed T4. There were significant ($p < 0.05$) difference among all the parameters measured for growth performance except initial weight which was not significantly ($p > 0.05$) different. The rabbit fed with diet T4 has the highest final weight and daily weight gain compared to those fed T1 and T3 but similar to those fed T2 diet Rabbits fed T1 diet had the poorest feed conversion ratio compared to others diets. The dressed weight, shoulder, slaughter weight, caecum, body length, thighs, rack, loin and kidney were significant ($p < 0.05$) different across the treatment groups. It could be from this finding that the use of T2 and T4 can support better growth and carcass production than other diets in Semi-Arid region of Nigeria.

Keywords: Rabbits, commercial grower feed, growth performance, carcass characteristic

Introduction

Nigeria like other tropical countries is marked by inadequate protein consumption resulting from shortfall in the production and supply of animal products. Many rabbit farmers depend on green forages or mixture of some home grains and kitchen wastes for feeding rabbits. Anya *et al.* (2010) reported that the best feed for rabbit is a commercial ration that can meet the rabbits nutrient requirement in addition to forages, hence there is need for a mixed feeding regime for optimum performance. Gower mash is one of the popular commercial feeds used for rabbit producers; there are various brands of this mash in the market. They include Top feed, Hybrid feed, Vital feed and Livestock feed.

This study was therefore, conducted to evaluate the effect of feeding different grower mash on the growth performance and carcass characteristics of growing rabbits.

Materials and Methods

Experimental animals and management: The study was conducted at the Livestock Teaching and Research Farm, University of Maiduguri, Maiduguri, Borno State, Nigeria. Twenty-eight crossbred rabbits (Dutch x New Zealand White) between 5 and 7 weeks of age were used for the 8 – weeks feeding trial. The rabbits were individually weighed, equalized for weight and randomly assigned to the four (4) treatments and each treatment contain seven (7) (replicates). Each rabbit was caged individually. The rabbits were provided with the experimental diets and clean drinking water *ad libitum*. Data collection commenced after an initial adjustment period of seven days.

Experimental diets: Four different commercial growers mash (Top feed, Hybrid feed, Livestock feed and Vital feed) were brought from different poultry feed vendors. The feeds were designated as as Hybrid feed (T1), Vital feed (T2), Top feed (T3) and Livestock feed T4

Data collection: Each rabbit was weighed at the inception of the experiment and weekly thereafter to obtain the weekly and daily body weight gain throughout the experimental period. The feed conversion ratio was calculated as the dry matter feed intake divided weight gain. The proximate compositions of different commercial growers mash were determined according to AOAC (1980).

Carcass measurements: At the end of the experiment, eight rabbits (two rabbit from each replicate based on average weight) from each treatment were selected for slaughter.

Statistical analysis: All the data collected were subjected to analysis of variance (ANOVA) using Complete Randomized Design (Steel and Torrie, 1980). Means were separated where applicable using the Duncan's multiple range test (Duncan, 1955). A computer package (Statistix 9.0) was used for the analysis.

Result and Discussion

The proximate composition of the grower feed is presented on the Table 1. The lowest crude protein was observed in T1 while the highest value was obtained in T4. The crude protein values (13.82 to 17.52%) obtained in the study is close to the protein requirement 17-18% for rabbit as reported by (Anyia *et al.* 2010). The lowest crude fibre was observed in T3 while the highest value was obtained in T4. The crude fibre values obtained in this study is closed to the fibre requirement 15-20% growing rabbits as reported by (Lang *et al.*, 1982). The lowest ether extract values were observed in T1 and T3 while the highest value was obtained in T4. The ether extract values obtained in this study is adequate to meet the fat requirement of growing rabbit 3-5% as reported by (Cheeke, 1987). The ash values obtained were similar among the diets and adequate to meet the requirement for rabbit as stated by (Cheeke, 1987).

The nitrogen-free extract was numerically highest in T3, while the lowest value was recorded in T4. The highest Metabolizable energy (ME) value was obtained in diet while the lower values were recorded in other diets with similar ME. However, all the diets can meet the ME requirement of growing rabbits as reported by (Ehebha *et al.*, 2010).

Table 1: Proximate composition of four different brands of commercial growers mash

Parameters	T 1	T 2	T 3	T 4
Dry matter	97.90	98.75	98.90	97.15
Crude protein	15.82	16.52	15.80	17.52
Crude fibre	19.00	15.50	14.00	21.50
Ether extract	6.00	6.50	6.00	8.00
A s h	14.00	14.50	14.50	15.00
Nitrogen-free extract	47.18	42.98	49.70	37.98
Metabolizable energy (kcal/kg)	2746.23	2663.53	2834.95	2644.53

ME = Metabolizable energy calculated according to the formula of Ponzenga (1985):

ME = 37x% CP+81x%EE+35.5 x %NFE Key: T1 (Hybrid feed); T2 (Vital feed); T3 (Top feed) and T4 (Livestock feed)

The result of the performance parameters is presented in Table 2. There were significant ($p < 0.05$) differences among all the parameters measured except for initial weight which was not significantly ($p > 0.05$) different among the treatment groups. The rabbits fed T4 diet had the highest final weight and daily weight gain compared to those fed T1 and T3 but similar to those fed T2 diet. The highest weight gain recorded by rabbits fed T2 and T4 (Livestock feed) diets could be as a result of higher crude protein recorded as earlier mentioned. However, the values were comparable to the values reported by Ehebha *et al.* (2010) who fed growing rabbits with different commercial feed. There was no significant ($p > 0.05$) difference between rabbits fed T1, T2 and T4 diets on daily feed intake. This may be due to lowest fibre recorded by T3 (Top feed) diet which is below the fibre requirement as reported by (Lang *et al.*, 1982). Rabbits on diet T1 (hybrid) diet had the poorest feed conversion ratio compared to others diets which recorded the best and also agrees with report of Anyia *et al.* (2010).

Table 2: Growth Performance of rabbits fed different commercial growers mash

Parameters	T 1	T 2	T 3	T 4	S E M
Initial weight	428.00	468.00	469.00	421.00	33.70 ^{NS}
Final weight	1177.00 ^b	1345.70 ^{ab}	1237.70 ^b	1506.70 ^a	68.94 [*]
Daily weight gain	13.36 ^b	15.67 ^{ab}	13.73 ^b	19.39 ^a	1.97 [*]
Daily feed intake	60.26 ^a	65.35 ^a	52.23 ^b	66.22 ^a	2.50 [*]
Feed conversion ratio	4.51 ^a	4.17 ^b	3.80 ^b	3.42 ^b	0.45 [*]

SEM = Standard error of mean; NS = Not significant ($p > 0.05$) difference; * = Significant

($p < 0.05$) difference; a, b = means in the same row with different superscripts are significantly

($p < 0.05$) different Key: T1 (Hybrid feed); T2 (Vital feed); T3 (Top feed) and T4 (Livestock feed)

The results of carcass parameters is presented in Table 3. The dressing percentage, skin, tail, feet, heart, lungs, stomach, small intestine, large intestine, stomach length, small intestine length, large intestine length showed no significant ($p > 0.05$) difference while dressed weight, shoulder, slaughter weight, liver, caecum, body length, thighs, rack, loin and kidney were significantly ($p < 0.05$) different. The dressed weight and shoulder of rabbit fed T4 recorded the highest compared to T1, T2 and T3.

The slaughter weight, thigh, caecum and body length of rabbit fed T4 (Livestock feed) diet recorded the highest values compared to those fed T1 (Hybrid feed) and T3 (Top feed) diets but did not differ ($p > 0.05$) from those fed T2 (Vital) diet. The rack of rabbit fed T4 (Livestock feed) diet recorded the highest value compared to those fed T3 (Top feed) but similar ($P > 0.05$) to those fed T1 (Hybrid) and T2 (Vital) diets. The loin of rabbits fed T4 (Livestock) diet significantly ($P > 0.05$) higher than those fed T1 (Hybrid feed) and T3 (Top feed) diets but did not differ ($p > 0.05$) those fed T2 (Vital) diet. The kidney of rabbits fed T4 (Livestock) diet obtained the superior value compared to T1 (Hybrid feed) but similar to T2 (Vital) and T3 (Top feed). The values recorded in this study were compared favorably with those reported by Igwebuike *et al.* (1995) who fed sorghum waste to growing rabbits and slaughtered rabbits of comparable weight.

Table 3: Carcass characteristics rabbits fed different commercial growers mash

Parameter	T 1	T 2	T 3	T 4	S E M
Dressed weight	540.33 ^b	635.33 ^b	566.00 ^b	761.00 ^a	29.50 [*]
Slaughter weight	1177.00 ^b	1345.70 ^a	1237.70 ^b	1506.70 ^a	68.94 [*]
Dressing %	45.94	47.14	45.75	50.63	1.61 ^{NS}
Shoulder/forelegs	150.67 ^b	179.33 ^a	153.67 ^b	189.00 ^a	4.39 [*]
Thigh	236.00 ^b	284.67 ^{ab}	239.67 ^b	324.33 ^a	19.45 [*]
Rack	51.33 ^{ab}	57.33 ^{ab}	46.67 ^b	66.67 ^a	4.63 [*]
Loin	100.67 ^c	139.33 ^{ab}	125.00 ^{bc}	171.33 ^a	9.61 [*]
Feet	33.00	37.00	33.67	43.00	2.95 ^{NS}
Heart	3.00	3.67	3.67	4.00	0.51 ^{NS}
Kidney	9.67 ^b	11.67 ^{ab}	10.67 ^{ab}	13.33 ^a	1.04 [*]
Head	115.33	119.00	113.00	128.67	5.07 ^{NS}
Lungs	7.00	8.33	7.00	8.33	1.61 ^{NS}
Skin /Pelt	101.67	119.00	99.00	118.33	6.91 ^{NS}
Tail	6.33	5.67	4.00	5.00	1.09 ^{NS}
Small intestine	47.33	24.33	30.00	25.33	8.14 ^{NS}
Caecum	97.33 ^b	104.33 ^{ab}	68.00 ^b	145.33 ^a	14.67 [*]
Stomach	94.00	96.00	97.00	92.33	10.24 ^{NS}
Large intestine	64.00	61.67	55.67	68.33	6.78 ^{NS}
Stomach length	9.00	10.00	10.00	9.33	0.83 ^{NS}
Large intestine length	132.00	163.67	143.00	163.67	29.49 ^{NS}
Small intestine length	139.00	87.00	180.67	146.33	41.87 ^{NS}
Caecum length	41.00	48.00	88.00	86.67	13.63 ^{NS}
Body length	27.00 ^b	29.33 ^{ab}	27.00 ^b	29.67 ^a	0.70 [*]

SEM = Standard error of mean; NS = Not significant ($P > 0.05$) difference;

* = Significant ($P < 0.05$) difference; a, b = Means in the same row with different superscripts are significantly ($P < 0.05$) different Key: T1 (hybrid); T2 (vital); T3 (top feed) and T4 (livestock)

Conclusion

Based on the growth performance and carcass characteristics, the T2 (Vital feed) and T4 (Livestock feed) diets recorded the best results compared to those fed T1 (Hybrid feed) and T3 (top feed) diets. Therefore, there is need to encourage farmers to used the best commercial grower diets for feeding growing rabbits in Nigeria

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