VOL. 6, NO. 5, MAY 2011 ISSN 1990-6145
ARPN Journal of Agricultural and Biological Science


www.arpnjournals.com

EFFECTS OF GRADED LEVELS OF MAIZE BRAN ON THE GROWTH AND CARCASS CHARACTERISTICS OF WEANED RABBITS

Onakpa M. M.[1], Onuh F.[2] and Gode D. S.[3]
[1]Department of Physiology and Biochemistry, Faculty of Veterinary Medicine, University of Abuja, Abuja, Nigeria
[2]Veterinary Teaching Hospital, University of Abuja, Abuja, Nigeria
[3]Federal College of Animal Health and Production Technology, National Veterinary Research Institute, Vom, Plateau State, Nigeria
E-Mail: onakpamm@yahoo.com

ABSTRACT

A total of sixteen weaned rabbits of different cross breeds and of age 6-7 weeks were randomly allotted to four dietary treatment groups containing 0 (control) T_1, T_2 17.5%, T_3 26.5% and T_4 25% levels. They were grouped into four treatments with each group having four replicates each. The rabbits were fed with graded levels of maize bran. The initial weight, average daily feed intake, feed conversion ratio were significantly ($P < 0.05$) by the treatment. There was no significant difference in daily weight gain ($P > 0.05$). The cost per kg feed intake were significantly ($P < 0.05$) influenced. For carcass analysis, there was no significant difference ($P > 0.05$) across the dietary treatment with respect to pre - slaughter weight, dressing%, liver, kidney weight, heart weight, small intestine, length, large intestine length, shoulder, pelt weight, head, rack weight, lungs weight, spleen and legs. There was significant difference ($P < 0.05$) in carcass weight, thigh weight, loin, weight and caecum length showed that graded level of maize bran could be influenced at 35% dietary inclusion in growing rabbits ration without deleterious effect.

Keywords: weaned rabbits, maize bran, carcass analysis, growth characteristics.

INTRODUCTION

The superiority of animal protein over plant protein had been widely reported. However there is limited access to protein sources in most countries of the sub-Saharan Africa, necessitating the continuous research into more cost-effective systems for meat production (Adewumi *et al.,* 2004).

Rabbit production is a veritable way of alleviating animal protein deficiency in Nigeria. This is as a result of its good attributes which include high efficiency in converting forage to meat, short gestation period, high prolificacy, relatively low cost of production, high nutritional quality of rabbit meat and ability to digest large amount of fibrous feed in the diet (Fielding, 1991 and Taiwo, 1999). Most Nigerians however suffer from malnutrition due to inadequate animal protein supply (Ajala *et al.,* 2004). This shortage is basically due to high cost of conventional meat sources such as beef, pork, chevon, mutton and poultry. There is therefore a need for cheaper alternative sources of meat to meet the protein requirements of the teeming population (Owen, 1981) Rearing animals with high prolificacy such as rabbit, poultry and pig can meet this need except that these animals require food which competes with man's diet (Aduku and Olukosi, 1990) leaving rabbit as a suitable alternative.

Currently, emphasis is placed on the quality of feed rather than its quantity as was practiced previously (Maxwell and Smith, 1992) as inadequate feeding was one of the major constraints to rabbit production. The cost of conventional fiber sources commonly incorporated in livestock feed is increasing annually. The purpose of this research is to investigate the influence of maize bran on carcass and growth characteristics of weaned rabbits.

MATERIALS AND METHODS

The study was conducted using eighteen (18), apparently healthy, weaned cross-bred, Lop x New Zealand rabbits, purchased from the National Veterinary Research Institute (NVRI), Vom, Plateau state, Nigeria. The rabbits were between 5 and 6 weeks of age were selected for trail at the time of the study. Before the arrival of the animals the rabbitry, the metabolic cages and all equipment such as drinkers, feeders, and buckets were thoroughly cleaned, washed and disinfected with dettol®.

The composition of the various diets fed the rabbits during the period of the study is shown in Table-1. The rabbits were fed 100g of feed at 7.00 hour each day and were allowed to access water *ad libitum.* There was an adaptation period of eight days for the animals to become accustomed to the feed. Before the start of the experiment, the rabbits were weighed and randomly allotted to the metabolic cages. The experiment was a complete randomized design. Eighteen weaned rabbits, of average weight 536g were allotted to four treatments, with six rabbits per treatment diet.

The animals were weighed weekly and feed intake was measured daily. Feed conversion rate was then calculated from the data obtained. At the end of the feeding trail, three rabbits selected from each treatment base on the group average weight were slaughtered. The animals were starved over night to clear the guts and live weight was recorded. The fur was removed by flaying carefully. Evisceration of the carcasses was carried out and the internal organs were weighed.

Samples of the experimental diets were analyzed for nutrient composition by AOAC (2000) procedures. Data collected were subjected to analysis of variance (Steele and Torrie, 1980) and means were

compared using Duncan's multiple range test (Duncan, 1955).

RESULTS AND DISCUSSIONS

The chemical composition of the experimental diets is shown in Table-2. The crude protein (CP) contents of the diets were approximately 18%. This CP level is adequate for weaned rabbits. Omole (1982) recommended protein level of 20% for weaned rabbits reared in tropical environment. The crude fibre (CF) levels of the diets increased with increasing levels of maize bran, a factor attributed to the higher CF content (10.6%) of maize bran which replaced maize in the diets. The CF levels of the diets (5.63-5.81%) were lower than the 14% recommended by Anugwa *et* al., (1988) for weaned rabbits. The fat levels (4.45-5.75%) of the diets were sufficient to meet the minimum level of 3% desirable to provide the essential fatty acids and to maintain glossy sleek hair (Cheeke, 1999).

The mean body weight, mean daily feed intake, daily weight gain and feed conversion ratio (FCR) are presented in Table-3. The final live weight (1187.5-1287.7g/rabbit) obtained at the end of the experiment were similar to the range reported by Onifade and Tewe (1993) for rabbits of comparable ages. Rabbits on diet 1 (0% maize bran) significantly ($P<0.05$) gained more weight than those on diets 2 and 3. The feed intake and FCR were however similar in all the treatments. The daily feed intake and FCR obtained in this study is in agreement with the values reported by other workers (Onifade and Tewe, 1993; Onifade *et al*., 1998) who fed diets containing about 30% maize offal to growing rabbits. The low feed intake reported by Cheeke (1999) for rabbits reared in temperate countries may be due to the variation in ambient temperature. Fielding (1991) reported that high ambient temperature has adverse effects on feed intake.

Results on carcass weight of weaned rabbit fed four dietary treatments are presented in Table-4. The result indicates that dietary treatment has no effect ($P>0.05$) on some internal organs of weaned rabbits. Liver weight, Kidney weight, heart weight, small intestine length, lungs weight does not show significant difference across the treatment means. However, significant difference ($P<0.05$) was observed in carcass weight, thigh weight, loin weight, and caeca length with T_4 (25%) inclusion rate being best of all. This is in agreement with Capper *et al*., (1988) who used graded levels of maize bran in rabbits of similar age.

CONCLUSIONS

The result of the study indicated that 35% of maize bran could be included in the diet of weaned rabbits without adverse effects on performance. The superior weight gain of rabbits on the control diets could be offset by the relatively cheaper unit cost of diets containing maize bran. Farmers should therefore take advantage of availability of maize bran to lower the cost of feed and also increase their profit margin.

Table-1. Composition of experimental diets fed to growing rabbits.

	T_1 %	T_2 %	T_3 %	T_4 %
Maize	44	41	38.5	36.5
F/Fat	16.75	19.75	22.25	24.25
Wheat offal	35	17.5	8.75	0
Maize bran	0	17.5	26.25	35
Bone meal	2.5	2.5	2.5	2.5
Lime stone	1	1	1	1
Premix	0.25	0.25	0.25	0.25
Salt	0.3	0.3	0.3	0.3
Methionine	0.1	0.1	0.1	0.1
Lysine	0.1	0.1	0.1	0.1
Total	100	100	100	100

Table-2. Results of sample analysis (weight (g) per gram of sample).

Sample	Moisture	Crude protein	ME	Crude fibre	Crude fat	Ash	NFE	Calcium	Phosphorus
D1	12.53	17.7	2717	5.63	4.85	8.57	52.23	1.05	0.05
D2	13.50	17.8	2323	5.75	4.84	6.78	53.05	0.53	0.03
D3	14.12	17.99	2375	5.76	5.75	6.33	56.37	0.85	0.03
D4	15.36	18.2	2927	5.81	4.45	5.58	55.92	0.85	0.05

Table-3. Performance of weaner rabbits fed graded levels of maize bran.

	0 %	17.5 %	26.26 %	35 %	
Parameters	**T_1**	**T_2**	**T_3**	**T_4**	**SEM**
Initial wt. (g)	743.75[a]	643.75[a]	743.75[a]	587.5[b]	25.95[*]
Final wt. (g)	1227.5[a]	1212.5[b]	1187.5[a]	1287.7[b]	39.34[*]
Daily feed intake	48.07[a]	59.63[a]	58.1[a]	59.83[a]	1.73[*]
Daily wt. gain (g)	9.49	10.16	9.71	10.72	5.34
FCR	5.68[a]	5.98[a]	5.99[a]	5.93[a]	27.21[*]

SEM: Standard error of mean
FCR: Feed conversion rate

Table-4. Carcass characteristics of weaner rabbits fed graded levels of maize bran.

Parameters	**T_1**	**T_2**	**T_3**	**T_4**	**SEM**
Pre-slaughter weight (g)	1203.33	1209.66	1205.00	1155.00	1302
Carcass weight (g)	535.00	506.67	515.00	555.33[*]	5.78
Dressing %	85.64	41.79	89.39	43.66	6.43
Liver wt (g)	1203.33	1209.67	1205	1155	1.60
Kidney weight (g)	1.53	2.00	2.00	2.70	0.21
Heart weight (g)	1.35	1.00	0.64	0.60	0.31
Small intestine length (cm)	90.00	71.00	100.00	110.00	4.13
Legs weight (g)	6.47	6.60	5.77	6.03	0.12
Thigh weight (g)	19.90	18.73	20.05	20.22	25.91[*]
Shoulder weight (g)	7.90	8.80	9.63	10.13	0.24
Pelt weight (g)	22.13	19.93	17.83	17.80	0.99
Head weight (g)	16.90	17.62	18.31	16.60	1.02
Rack weight (g)	20.22	20.10	18.83	19.10	0.24
Loin weight (g)	23.29	20.15	20.29	22.19	26.4[*]
Spleen weight (g)	0.09	0.07	0.08	0.07	1.31
Caecum length (cm)	35.93	50.80	65.06	70.47	3.43[*]
Large intestine length (cm)	153.00	151.33	222.67	167.00	8.79

REFERENCES

Adewumi M.K., Sokunbi O.A., Adejumo O.O., Omojola A.B. and Anurudu N.F. 2004. Effects of different fibre sources on performance and physiological response of pre pubertal male rabbits. Trop. J. Anim. Sci. 7(1): 33-40.

Aduku A.O. and Olukosi J.O. 1990. Rabbit Management in the Tropics: Production, Processing, Utilization, Marketing, Economics, Practical training, Research and Future Prospects, Living Book Services, G.U. Publications, Abuja, Nigeria.

Ajala M.K. and Alli-Balogun J.K. 2004. Economics of rabbit production in Zaria, Kaduna State. Trop. J. Anim. Sci. 7(1): 1-10.

Anugwa F.O.I., Adesua M. and Ikurior S.A. 1998. Proceedings NSAP conference. pp. 610-611.

A.O.A.C. 2000. Association of Official Analytical Chemists. Official Methods of Analysis 12th Ed. Washington, D.C.

Capper B.S., Cox D.R.S., Jewers K. 1988. Overseas Development of Natural Resource Institute. The small scale manufacture of compound animal feed bulletin. (9): 58-61.

Cheeke P.R. 1999. In: Livestock Feeds and Feeding. D.C. Church (Ed), O and B Books Inc. Corvallis, Oregon, USA. pp. 272-275.

Duncan D.B. 1955. Biometrics. 11: 1-42.

Fielding D. 1991. Rabbits: The Tropical Agriculturist. Macmillan Press Ltd. London. p. 106.

Maxwell S. and Smith M. 1992. Household Food Security: A Conceptual Review. In: Tallens, E. 1988. Food Security. Proceedings of a CTA Seminar, Lovma Productions. Anieane, France, Belgium. pp. 27-50.

Omole T.A. 1982. J. Appl. Rabbit Res. 5: 83-88.

Onifade A.A., Abu O.A., Akande O.N. and Abanikannda O.F.T. 1988. World Rabbit Science. 1: 17-24.

Onifade A.A. and Tewe O.O. 1993. World Rabbit Science. 1(1): 17-24.

Owen I.E. 1981. Rabbit meat for the developing countries. World Anim. Rev. 39: 2-11.

Steel R.D.G. and Torrie J.H. 1980. Principles and Procedures of Statistics. A Biometrical Approach. 2nd Edition. McGraw-Hill Book Company. London.

Taiwo B.B.A., Ogundipe. I.I. and Ogunsiji O. 1999. Reproductive and growth performance of rabbits raised on forage crops. In: Proc. Of the 4th Annual Conference of the Animal Association of Nigeria held in Ibadan, Nigeria. pp. 108-109.