

PHYSICO-CHEMICAL PROPERTIES OF WEANED RABBITS FED VARYING LEVELS OF KENAF GRAIN-LEAF MIXTURES MEAL

J. O. FAYENUWO¹, A. J. OMOLE¹, A. O. AWE², Y. A. POPOOLA¹,
O. T. OWOSIBO¹, J. O. ODEJIDE³, V. E. OKPEZE³

¹Obafemi Awolowo University, Institute of Agricultural Research and Training Moor Plantation, Ibadan, Nigeria.

²Federal College of Animal Health and Production Technology, Moor Plantation, Ibadan

³Federal College of Agric. Moor Plantation, Ibadan.

ABSTRACT

The study was conducted to determine the effect of feeding weaned rabbit with kenaf grain-leaf mixtures meal as replacement for groundnut cake meal fraction of the diet on dressing percentage, organ weights and meat quality. A total of thirty six weaned rabbits of mean weight 566.45 ± 2.65 g were randomly allotted into four dietary treatments replicated three times and each replicate contained three rabbit per replicate in a completely randomized design. Four diets were formulated to contain KGLM at 0% (KGLM₁) Control, 50% (KGLM₂), 75% (KGLM₃) and 100% (KGLM₄) as replacement for groundnut cake meal fraction in the diet of weaned rabbit. Data were collected on dressing percent, organs weight, chemical composition of the meat etc. The results shows that no significant difference was observed in dressing percentage of rabbits fed the control diet and 50% KGLM ($P > 0.05$). The dietary treatments had no significant effect on kidney, lung and heart weight ($P > 0.05$). The colour, taste, flavour, texture and general acceptability of the meat were relatively the same in all the treatments ($P > 0.05$).

Keywords: Groundnut cake meal, kenaf grain-leaf mixtures meal, dressing percentage, acceptability.

INTRODUCTION

Kenaf is usually considered as a fiber crop and primarily used for rope, twine, coarse cloth and paper (Cross 2000). Kenaf plant is composed of useful components (Swingles *et.al.*, 2001). The stalk is useful in paper industry while the leaves and the seed could be used for feeding livestock (Cross 2000; Swingles *et.al.*, 2001). Kenaf seed is rich in protein, the crude protein contents vary between 25 and 40% (Cross 2000; Swingles *et.al.*, 2001; Omole *et.al.*, 2014). The fibre content is highly digestible and varied between 6 – 13% depending on the cultivars, time of harvesting and season etc (Webber, 1993; Swingles *et.al.*, 2001). The seed is rich in oil and its content is similar to cotton seed oil suggest that the oil is an excellent source of edible oil for human consumption (Webber, 1993). Kenaf leaf contains 8.7% NDF, 3.5% ADF and 15-34% crude protein (Webber, 1993; Swingles *et.al.*, 2001). In Nigeria, Kenaf leaf is considered as waste during harvesting but it could be utilized by livestock to improve growth and reduce cost of feeding. The grain is also rich in minerals such as calcium and phosphorus. The objective of this study was to determine the effect of

feeding weaned rabbit with KGLM as replacement for groundnut cake meal fraction of the diet on dressing percentage, organ weights and meat quality

MATERIALS AND METHOD

Experimental design

A total of thirty six weaned rabbits of mean weight 566.45 ± 2.65 g were randomly allotted into four dietary treatments replicated three times and each replicate contained three rabbit per replicate in a completely randomized design. The rabbit were acclimatized for one week before the commencement of the feeding trial. Kenaf grain meal (KGM) was purchased from I.A.R. & T. Ibadan, Oyo state, Nigeria. Kenaf grain was toasted and mixed with dry kenaf leaf in ratio 3:1 and later incorporated with other feedstuffs. Four diets were formulated to contain KGLM at 0% (KGLM₁) Control, 50% (KGLM₂), 75% (KGLM₃) and 100% (KGLM₄) as replacement for groundnut cake meal fraction in the diet of growing rabbit. The diets were formulated to contain about 16% crude protein and energy of about 2600 kcal/kgME (Table 1).

Carcass evaluation

At the end of the feeding trial, 2 rabbits per replicate were randomly selected and weighed for carcass and organ evaluation. The rabbits were starved overnight before slaughtering. The fur was removed by scalding. The dressing percentage was calculated as the ratio of dressed weight to live weight, organs like kidneys, lung, liver and heart were removed and weighed individually. The meat samples (feet) were cooked separately for 18 minutes without salt and 120ml of water was added to the meat before cooking. The cooked meat samples were served to eleven taste panelist for rating with the aid of questionnaires that were administered for rating (colour, appearance, flavor, texture, taste and overall acceptability) of the meat samples according to the method of Larmond (1977). The rating was 1,2,3, 4, 5, 6, 7, 8 and 9 which correspond to dislike extremely, dislike very much, dislike moderately, dislike slightly, Neither like nor dislike, Like slightly, like moderately, like very much, like extremely. The treatment scores was assessed by choosing the score rating of each samples with highest frequency and then the mean scores of treatment based samples calculated on each of the meat sensory characteristics (colour, appearance, flavor, texture, taste and overall acceptability).

Chemical and statistical Analyses

The chemical composition of the test ingredient, experimental diets were carried out according to the method of (AOAC, 1990).

RESULTS AND DISCUSSION

The dressing percent of the rabbit fed varying levels of KGLM in the diet is shown in Table 2. No significant difference was observed in dressing percentage of rabbits fed the control diet and 50% KGLM ($P>0.05$) but there was significant differences in the control diet and 100% replacement of GNC with KGLM ($P<0.05$). The dressing percentage recorded in this study was relatively similar to the observation of Orunmuyi, *et al* (2006): The dietary treatments had no significant effect on kidney, lung and heart weight as shown in Table 2. This also buttressed the fact that KGLM is safe for inclusion in the diet of rabbits. It has been recorded that animal with abnormal or higher liver weight may be suffering from one disease or another (Awosanya and Akinyode, 2000).

The dressing percent reported in the control diet and treatment 2 were similar to the reports of Etuk and Udedibe (2006). The chemical composition of the meat of the rabbit fed varying levels of KGLM in the diet is shown in Table 2. The crude protein percent ranged between 19.11 in the control diet and 19.11 in treatment 4 ($P>0.05$). No significant differences were also observed in the ash and fat contents of the meat which also implies that KGLM could be used as substitute for groundnut cake meal without affecting the nutritional values. The low fat content reported in this study was in agreement with other authors (Awosanya and Akinyode, 2000; Orunmuyi *et al.*, 2006) and corroborated the report that rabbit contains low fat content which makes the meat an antidote for those that have fat related diseases. Table 3 shows the result of organoleptic properties of the meat of the rabbit fed varying level of KGLM in which the colour, taste, flavour, texture and general acceptability of the meat were determined by the panelists. The meat was not influenced by feeding KGLM to the rabbits ($P>0.05$). The ranges of mean score values for colour of the meat was from 6.71 to 6.78, taste ranges from 7.21 to 7.24 ($P>0.05$), flavour, from 6.61-6.67 ($P>0.05$), texture from 6.61 to 6.78 ($P>0.05$) while that of general acceptability ranges from 6.72 to 6.82 ($P>0.05$). The results also buttressed the earlier reports by Omole *et. al* (2014) that kenaf grain meal and fresh leaf has been used to feed other livestock species such as snails rabbits, poultry and lambs without any adverse effect on their growth and carcass quality of the meat. It could be concluded that kenaf grain-leaf mixtures meal could be used as feed resource and substitute for groundnut cake meal.

REFERENCES

- Association of Official Analytical Chemist, A.O.A.C. (1990). Official Methods of Analysis, 13th Edition, Washington, D. C.
- Awosanya, B. A. and Akinyode, M.A.(2000) Treatment effect of leucaena Leaf meal on the carcass characteristics of Rabbits Nig. J. of Animal Prod. (2000).27(1):90 -94
- Cross (2000) Kenaf - An Alternative Crop for the Tropics http://www.satglobal.com/about_kenaf.htm
- Etuk, E.B. and A.B.I. Udedibe (2006). Effect of cooked pigeon pea seed meal on the performance, dressed and organ weight characteristics of broilers. *Nigerian Journal of Animal Production* 33 (1): 16 – 22.

- Omole, A.J., Popoola, Y.A., Ajasin F.O., Okpeze, C.N., Ononogbu, C., Boladuro, B.A., Onuoha¹, C.A. (2014) Performance Of Hatchling Snails (*Archachatina Marginata*) Fed Varying Dietary Levels Of Kenaf Grain Meal In The Diet. Proceedings of the 3rd International Conference on Giant African Land Snails held at Federal College of Education Osiele, Abeokuta on 1st 4th June, 2014.
- Orunmuyi, M. Bawa, G.S. and R.M. Musa (2006): Performance of weaner rabbits fed graded levels of sun-dried sweet potato tuber meal (*Ipomea batatas*) diets. Nigeria Journal of Animal Production 33 (2): 186 – 191.
- Swingles, R.S. Urias, A.R, Doyle J.C And Voigt R.L. 2001 Chemical composition of kenaf forage and its digestibility by lamb and invitro and digestibility. <http://www.jas.fass.org>
- Webber, C.L. 1993 Crude protein and yield components of six kenaf cultivars as affected by crop maturity. Ind. Crops Prod. J. 2:27–31.
- S.A.S. (1999). S.A.S. User's Guide. Statistical Analysis System Institute, Inc. Cary, N.C. 7th ed. 78pgs.

Table 1: Gross Composition of the Experimental Diet.

Ingredient (%)	KGLM ₁ (0% KGLM)	KGLM ₂ (50% KGLM)	KGLM ₃ (75% KGLM)	KGLM ₄ (100% KGLM)
Maize	32.0	32.0	32.0	32.0
Groundnut cake	10.0	5.0	2.5	0.0
ABM	0.0	5.0	7.5	10.0
*Others	58.0	58.0	58.0	58.0
Total	100.0	100.0	100.0	100.0
Cost/kg feed (N/kg)	51.64	49.40	47.89	46.12
Calculated analysis				
Crude protein (%)	16.45	16.35	16.13	15.91
Metabolizable energy (kcal/KgME)	2628.1	2611.0	2602.2	2589.32

*Other fixed ingredients : Wheat offal-24, BDG, 25, Fish meal-0.5, Soya bean meal-2.55, Bone meal-1.50, Oyster shell-4.2, Premix-0.25.

KGLM- Kenaf grain- leaf meal mixtures

Table 2. Carcass yield and chemical composition of weaned rabbit fed different levels of KGLM in the diet

Parameters (Means)	KGLM ₁ (0% KGLM)	KGLM ₂ (50% KGLM)	KGLM ₃ (75% KGLM)	KGLM ₄ (100% KGLM)	± SEM
Live-weight (g)	2711.23	2705.99	2372.73	2357.38	15.07
De-furred weight	2620.65 ^a	2613.45 ^a	2291.58 ^b	2280.06 ^b	18.67
Fur weight %	3.34	3.42	3.42	3.28	1.23
Eviscerated weight %	2037.21 ^a	2026.24 ^a	1695.32 ^a	1674.92 ^a	35.05
Dressing %	75.14 ^a	74.88 ^a	71.45 ^b	71.05 ^b	1.55
Heart weight %	0.67	0.79	0.76	0.76	0.12
Liver weight %	2.53	2.48	2.49	2.48	0.26
Lung weight %	1.69	1.73	1.72	1.79	0.05
Crude protein	19.41	19.02	19.14	19.11	1.24
Crude fibre	0.03	0.04	0.01	0.04	0.003
Ether extract	0.71	0.73	0.71	0.70	0.02
Ash	11.98	11.81	11.82	11.76	0.21

Means along rows with different superscript are significantly different from each other ($P < 0.05$)

KGLM- Kenaf grain- leaf meal mixtures

Table 3. Organoleptic properties of the meat of growing rabbit fed varying levels of KGLM in the diet

Mean Score Values	K ₁ (0% KGLM)	K ₂ (50% KGLM)	K ₃ (75% KGLM)	K ₄ (100% KGLM)	±S.E.M.
Colour	6.78	6.77	6.71	6.72	0.44
Taste	7.24	7.21	7.22	7.24	0.42
Flavour	6.67	6.61	6.61	6.62	0.45
Texture	6.78	6.72	6.70	6.61	0.41
General Acceptability	6.82	6.70	6.72	6.82	0.4

Means along rows with different superscript are significantly different from each other ($P < 0.05$)

KGLM- Kenaf grain- leaf meal mixtures