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RESEARCH ARTICLE

Growth & carcass characteristics of weaned rabbits fed diets containing graded levels of sun dried Shea- nut (*Vitelaria paradoxa*) cake.

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Abstract

The study was to evaluate the growth performance and carcass characteristics of weaned rabbits fed diets containing varying levels of sun dried Shea-nut (*Vitelaria paradoxa*) cake. The experiment which lasted for 70days contained 4 treatments with 0%, 20%, 25% and 30% inclusion of Shea-nut cake in treatments 1, 2, 3, and 4 respectively. A total of 48 unsexed weaned rabbits were randomly allotted to the 4 treatments where each treatment had 4 replicates of 3 rabbits per replicate in a completely randomized design. The Shea-nut cake used was sundried and milled with the other feed ingredients. The parameters measured include feed intake, initial weight, final weight and carcass weight. While weight gain, feed conversion ratio and mortality rate (%) were calculated. The results showed that the Rabbits on diet T4 (30% inclusion) had significantly higher body weight gain and feed efficiency than those on the other diets, the carcass analysis also showed that the eviscerated weight and cut-up parts (such as hind limb, fore limb, back, thorax, loin, and tail) weights of the rabbits on diet T4 (30% inclusion) were not significant ($P>0.05$) but the dressed weight, head and neck were significantly higher ($P<0.05$) than the others. The results showed that sun-dried shea-nut cake improved the feed intake and body weight gain of rabbits fed 30% of shea-nut cake. Shea-nut cake could therefore be used in rabbit diets up to 30% in the diets of weaned rabbits. Shea-nut cake should also be tried in the feed of other farm animals.

INTRODUCTION

Rabbit is a micro-livestock and an economic animal that could bridge the wide gap in Nigeria's dietary protein. Rabbit is socially acceptable, requires little space and without religious taboos. Rabbit has peculiar digestive system that supports its use of forages and agro-industrial by-products, thus reducing its competition with man for cereals and legume grains (**Ahemen *et al.,*** 2013).

The search for cheaper and available feed ingredients with little or no competition with man's dietary demands has been the interest of Nigerian animal producers. One of such cheap and available by-products that could be adopted as feed ingredient is the Shea nut cake which occurs in Nigeria in places where the Shea butter is extracted from the Shea-nut seed or fruit by crushing and boiling. Shea nut cake is an unconventional feed stuff that is a cheap and could serve as a good source of energy and protein in rabbit production and has been found to generally enhance growth and production of livestock (**Odunsi *et al.,* 1996**). Its incorporation in rabbit's diet has been reported to result in compounded feeds with nutrient profile that competes favorably with feed of conventional feedstuff and so reduced feed cost and competition with humans (**Oladejo *et al.,* 2006** & Shittu ***et al.,*** 2004).

Since good performance and carcass yield are necessary for optimal production and profitability of livestock, then the need to reduce feed cost is fundamental.

This study was conducted to evaluate the effects of graded levels of sundried Shea-nut (*Vitellaria paradoxa*) cake meal on the growth performance and carcass characteristics of weaned rabbits.

Materials and methods

Location of Experiment: This experiment was carried out at the rabbits unit of the Federal college of Animal Health and Production Technology, Moor plantation, Ibadan. The site is located in the rain forest zone of South-western Nigeria on longitude 7^0 23^1 and latitude 4^0 53^1 E and 76m above sea level. The climate is humid with a mean annual rainfall of 1037mm and mean temperature of 34.7^0C, respectively. (Google Earth7.0, 2014).

Experimental Design and Management of Experimental Animals: A total of 48 unsexed weaned rabbits were sourced from a reputable farm, acclimatized for two weeks (14 days) during which they were treated against internal and external parasites. The rabbits were randomly divided into 4 treatments each, replicated 4 times with 3 rabbits each, in a completely randomized design and housed in wooden cages with wire mesh. Feed and water were supplied *ad-libitum* to all the rabbits throughout the experiment which lasted for 8 weeks (56 days). The statistical model used was:

Yij= μ+Ti +eij, where

Yij= the j^{th} observation in the i^{th} treatment

μ= Overall mean, Ti= Effect of the treatment, Eij= Random error

Processing of Test Ingredients and Experimental diets: The test ingredient (Shea-nut cake) used was collected from the Shea butter processing centre at Tede, Atisbo local government area of Oyo state. The cake was sundried for 4 days to reduce its anti-nutritional contents, analyzed for proximate composition and ground before it was incorporated into the rabbits feed.

Four diets were formulated for the study (Table 1). Diet 1 was the control without the inclusion of Shea-nut cake T1=0% SNC, while (diet 2) T2=20% (3.58kg/100kg feed), T3=25% (4.48kg/100kg feed) and T4=30% (5.376kg/100kg feed) inclusion of Shea-nut cake respectively.

Data collection for Growth performance: Data for initial live weight, weekly live weight gained, feed intake and Final live weight of each rabbit was taken at the end of the experiment and recorded. The feed conversion ratio of the rabbits was then calculated.

Carcass evaluation: At the end of the experiment, eight (8) rabbits per treatment [i.e. two (2) rabbits per replicate] making a total number of thirty two (32) rabbits were randomly selected and starved over night but offered water to prevent shrinkage. Each rabbit was weighed, slaughtered, properly bled, scalded, eviscerated and dressed. The carcass was thereafter cut up into parts and the weight of each part was recorded for carcass evaluation with a sensitive scale. The bled and dressed weights were expressed as percentages of the live weight while the cut-up parts were expressed as percentages of the dressed weight.

Chemical and Statistical analysis: The test ingredient (SNC) and respective experimental diets were analyzed for proximate composition using the procedure of **AOAC (1990)**. Data obtained were subjected to analysis of variance (ANOVA) and the means were compared by the use of Duncan multiple range test using a statistical package of 2004 (SAS 2004).

Results and Discussion:

There was similarity among the initial weights of the rabbits across the treatments as shown in Table 2 but the final weight of the rabbits in treatment 4 (30% SNC) was significantly higher than in other treatments ($P<0.05$) (**Skuly, 2000** and **Odion, 2003**). Treatment 4 had the highest weight gain (1293.33g) while the least gain was recorded in treatment 1 (0% SNC). Based on the carcass evaluation, in Table 3, only the Head and Neck were significantly different ($P<0.05$), treatment 4 (30% SNC) had the highest dressed weight (665.16g) and treatment 3 (25%) had the lowest value (440.64g). The values were significantly different ($P<0.05$) since the treatments had no influence on the cut-up parts except the head and neck, other variations observed could have resulted from genetic and individual difference. (**Agunbiade *et al.*, 1999**).

Conclusion:

It can be concluded from this study that sun dried shea-nut cake can be included in the diet of weaned rabbits at 30%,as partial replacement for ground nut cake, as it improved the growth performance and the dressed weight of weaned rabbits fed with the diet. Research to support improved production techniques of shea-nut plant is however needed to enable farmers produce the meal at lower cost for economic use in animal feeding. Other processing methods should be used to further reduce the anti-nutrients in shea-nut cake.

Table 1: Gross composition of experimental diets

INGREDIENT	T1	T2	T3	T4	
Maize	40.00	40.00	40.00	40.00	
Groundnut cake	17.92	14.07	13.44	12.54	
Shea-nut cake	0.00	3.58	4.48	5.38	
Wheat bran	34.00	34.00	34.00	34.00	
Fish meal	0.40	0.40	0.40	0.40	
Bone meal	4.00	4.00	4.00	4.00	
Premix	0.28	0.28	0.28	0.28	
Salt	0.28	0.28	0.28	0.28	
Limestone	2.92	2.92	2.92	2.92	
Methionine	0.10	0.10	0.10	0.10	
Lysine	0.10	0.10	0.10	0.10	
Total	100	100	100	100	
Determined analysis					Shea-nut cake
Dry matter	91.86	91.98	92.44	92.52	94.15
Crude Protein	16.58	16.89	17.27	17.39	14.70
Ether extract	3.61	3.66	3.74	3.69	12.15
Crude fibre	9.48	9.67	10.04	9.85	11.25
Total ash	7.34	7.62	8.21	7.96	16.40
N F E	54.85	54.14	53.18	53.63	39.65
CalculatedEnergy (Kcal/kg)	2855.93	2841.38	2832.81	2849.14	2945.35

Key: N F E=Nitrogen free extract

Table 2: Growth performance of weaned rabbits fed diets containing sun-dried shea nut cake

Parameters	T1 (0%)	T2 (20%)	T3 (25%)	T4 (30%)	SEM (±)
Initial weight (kg)	0.54	0.48	0.49	0.52	0.02
Final weight (kg)	0.84^{b}	0.97^{ab}	0.95^{ab}	1.03^{a}	0.04
Weight gain (kg)	0.30^{b}	0.49^{a}	0.46^{a}	0.51^{a}	0.02
Feed intake (kg)	0.59	0.59	0.61	0.61	0.01
FCR	2.26^{a}	2.27^{b}	2.25^{a}	2.21^{b}	0.31
Mortality (%)	4.17^{a}	4.17^{a}	4.17^{a}	2.08^{b}	1.07

^{ab}: means on the same row with different superscripts were significantly different ($p<0.05$).

KEY: SEM- Standard error of mean, FCR- Feed conversion ratio

Table 3: Carcass characteristics of weaned rabbits fed diets containing sun-dried shea nut cake

Parameter	T1 (0%)	T2 (20%)	T3 (25%)	T4 (30%)	SEM (±)
Live weight (g)	1190.33	1176.67	909.66	1293.33	55.54
Bled weigh (g)	1121.67	1103.33	861.67	1167.67	29.90
Dressed weight(g)	609.21^{a}	607.28^{a}	440.64^{b}	665.16^{a}	15.55
Dressed[1](%)	51.18^{a}	51.61^{a}	48.44^{b}	51.43^{a}	28.29
Head[2] (%)	17.37^{ab}	17.79^{ab}	19.21^{a}	15.49^{b}	0.50
Hind limb[2] (%)	35.35	37.49	39.47	39.54	0.88
Fore limb[2] (%)	16.77	16.42	17.45	16.96	0.28
Loin[2] (%)	23.35	22.57	20.99	23.20	0.88
Neck[2] (%)	5.08^{a}	3.94^{ab}	4.93^{ab}	3.67^{b}	0.25
Thorax[2] (%)	19.98	20.68	20.02	21.77	0.49
Tail[2] (%)	0.82	0.98	0.91	0.75	0.04

^{ab}: Means on the same row with different superscripts were significantly different ($p<0.05$).

1: Parameters expressed as percentage of live weight

2: Parameters expressed as percentage of dressed weight

Key: SEM-Standard error of mean

References

1. **Agunbiade, J.A., Adeyemi, O.A.,Ashorobi, B.O., Adebanjo, M.O., Fasina, O.E. and Wande A.O. (1999).** Rabbits fed with cassava peel and leaf; effect on performance and carcass characteristics. Nigerian Journal of Animal Production. Page 26:29-34.
2. **Ahemen, T., Abua.H and Orakaanya T.T. (2013):** Sperm quality and testicularmorphology of rabbits fed dietary levels of Shea-nut cake (vitellaria paradoxa) meal. Agric.bio. J.N, 2013, vol.(3), pp 352-357.
3. **AOAC (1990),** Association of official analytical chemists, official methods of analysis. 15th edition, Washington page 15-43.
4. **Odion, B.Y. (2003),** Sociological aspects of introducing rabbits in to farm practices. In: proc. Workshop on rabbit husbandry in Africa, Moroko, Sweden, pp 93-99.
5. **Odunsi, A.A., Farinu, G.O. and Akinola, J.O. (1996),** influence of dietary Shea-nut cake (Vitteleria paradoxa) on the performance and carcass qualityNig .j.Anim prod;23:28-32.
6. **Oladejo, J.A., Sanusi, I.O., Ojedapo, Iwe A.O. and Adesanya, L.O. (2006).** Comparative analysis of rabbit feed production using alternative and conventional ingredients in Ibadan metropolisProc.31 Annual Con.Nig.Soc.Anim.Sci (NSAP) Kano, Nigeria. Page 54-67.
7. **SAS (2004):** statistical analysis system institute SAS user guide inc.
8. **Shitu, A.O, Olaoye G.A., Bariko M.O, (2004)**. Effect of using non-conventional feed stuffs, on the production and cost of rabbit's meat in the farm animal. Nigeria journal of animal production vol.3 page 65-78.
9. **Skuly, L.O. (2000),** Text of feed processing Technology. Vikas publishing House PVT LTD, New Delhi, India. Pp.70-80.