

EVALUATION OF VARYING LEVELS OF SESAME SEED MEAL (*Sesamum indicum*) IN THE DIET OF WEANED RABBITS

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ABSTRACT

Groundnut cake is one of major source of plant protein in the diet of livestock in Nigeria but expensive and this scenario led to this study in which the groundnut cake meal of the diet of weaned rabbits was replaced with sesame seed meal. A total of thirty six weaned rabbits of mean weight 517 ± 3.6 g were randomly allotted into four dietary treatments in which the diets were formulated to contain SSM at 0% (SSM₁) Control, 50% (SSM₂), 75% (SSM₃), 100% (SSM₄) as replacement for groundnut cake meal fraction in the diet of weaned rabbits. Each treatment was replicated three times and each replicate contained 3 rabbits per replicate in a completely randomized design. Parameters taken were weight gain, feed intake. Feed conversion ratio, total feed cost, and cost per weight gain were calculated. The mean daily feed intake was not significantly affected by the varying inclusion of SSM in the diet ($P > 0.05$). The mean total weight gain followed the same pattern with the feed intake ($P > 0.05$). The feed conversion ratio (FCR) which is the ratio of feed intake to weight gain was relatively the same in all the treatments. The highest cost/weight gain was recorded in the diet that containing zero% SSM while the lowest cost/weight gain was reported in SSM₄. Based on the present results, groundnut cake meal fraction of the diet could be partially or totally replaced with sesame seed as a means of reducing feed cost without adverse effect on weight gain and feed efficiency

INTRODUCTION

Rabbit production possesses vast potential in alleviating the problems associated with low protein intake in Nigeria and other developing economy, due to its high fecundity, short generation interval, and ability to utilize diverse forages (Omole, et al., 2007; Owen et al., 2009; Owen et al., 2009). Rabbits apart from their known reputed proficiency in reproduction, have higher quality protein, much lower fat/cholesterol and steady source of income than other livestock species (Owen, et al., 2009). The initial capital and cost of production is relatively low when compared to other livestock enterprises (Omole, et al., 2007; Owen et al., 2009). Protein feed stuffs mainly used in livestock production in Nigeria are groundnut cake, soybean meal and fish meal etc. (Omole et al., 2007). These aforementioned conventional feed ingredients are expensive and this has led to high production cost which is one of the major problems of livestock farmer in the country (Owen et al., 2009). As a result, many farms have closed down. Many farm workers have been retrenched and this problem has led to many vices in the country such as kidnapping, terrorism, inflation and dependency on importation of livestock products hence there is need for looking for alternative feed stuffs. The high cost of groundnut cake meal as a source of

protein necessitate looking for alternative source which is affordable and available. Sesame seed meal is nutritious and contains high protein level of about 46% crude protein. Sesame seed meal has been used in the diet of broilers and layers with impressive results on growth performance and carcass yield (Farran, et al., 2000; AlHarthi and Deek, 2009). This study was designed to determine the effect of feeding weaned rabbits with sesame seed meal as replacement for groundnut cake meal fraction of the diet on weight gain, feed efficiency and cost benefits.

MATERIALS AND METHODS

The experiment was carried out at the Rabbitry Unit of the Institute of Agricultural Research and Training (I.A.R. & T.), Moor Plantation, Ibadan. A total of thirty six weaned rabbits of mean weight 517 ± 3.6 g were randomly allotted into four dietary treatments replicated three times and each replicate contained 3 rabbits per replicate in a completely randomized design. The rabbits were acclimatized for one week before the commencement of the feeding trial. Four diets were formulated to contain SSM at 0% (SSM₁) Control, 50% (SSM₂), 75% (SSM₃), 100% (SSM₄) as replacement for groundnut cake meal fraction in the diet of weaned rabbits. The diets were formulated to contain about 16% crude protein and energy of 2600 kcal/kgME

(Table 1). Feed intake and weight gain were measured on daily and weekly basis with the use of sensitive weighing balance respectively. Feed intake was calculated by subtracting the left-over feed from the feed given while the weight gain was calculated by deducting the initial weight from the final weight. Feed conversion ratio was calculated as the ratio of feed intake to weight gain. Feed cost and cost per weight gain were also calculated. The feed cost and cost per weight gain were calculated. The prevailing market prices of the feed ingredients at Ibadan, Oyo State, Nigeria where the feed ingredients were purchased at the time of study were used to calculate the feed cost/kg feed and the cost of the feed to produce a unit weight (N/kg weight gain). The chemical composition of the test ingredient, experimental diets were carried out according to the method of (AOAC, 1990).

RESULTS AND DISCUSSION

The results of proximate composition of the test ingredient (Table 2) shows that the protein content of SSM was higher than that of groundnut cake. The crude protein content of the diet increased with increased level of SSM in the diets. The growth response of rabbits fed varying levels of SSM in the diet is shown in Table 3. The mean daily feed intake was not significantly affected by the varying inclusion of SSM in the diets ($P>0.05$). The mean total weight gain followed the same pattern with the feed intake ($P>0.05$). The mean weight gain of the rabbits in the control diet was ($P>0.05$) relatively the same with those fed diet containing 100% SSM as replacement for groundnut cake meal (GNC). The values of feed intake and weight gain recorded in this study was in agreement with the observation of Babatunde *et al.*, (2001). The feed conversion ratio (FCR) which is the ratio of feed intake to weight gain was relatively the same in all the treatments. The relatively the same FCR reported in the study is an indication that SSM could be used to replace GNC in the diet of rabbits. The low mortality reported also buttress the fact that groundnut cake meal could be replaced with SSM, also, the test ingredient used in this study was well processed, preserved and did not have any deleterious effect on the rabbits. (Farran, *et al.*, 2000, AlHarthi and Deek, 2009). The report of zero mortality was an indication that sesame seed meal could be used as feed resource for rabbits. The results of cost

analysis shows that the cost/kg feed and total feed cost reduced as the level of SSM increased from zero to 100% in the diets (Table 3). The highest cost/weight gain was recorded in the diet that contained zero% SSM while the lowest cost/weight gain was reported in SSM4 as observed in Table 3. The lowest cost/weight gain reported in SSM4 could be due to low cost of SSM compared to GNC, the prevailing market price of GNC during course of the feeding trials was N110 while the cost of SSM was N85. Low cost per weight gain has been observed by several authors when conventional feed ingredients was replaced by less expensive unconventional feed ingredients (Omole, *et al.*, 2007). Considering the cost benefits only, ground nut cake meal in the diet of rabbits could be replaced with sesame seed meal up to 100%. The lowest cost/ weight gain reported is an indication that sesame seed meal could be used to replace groundnut cake at reduced cost. The low mortality reported in all the treatments indicate that SSM had no detrimental effect on the rabbits. Proper adherence to management practices of the rabbits could also be responsible for the low mortality reported across the treatments. Based on the present results, groundnut cake meal fraction of the diet could be partially or totally replaced with sesame seed as a means of reducing feed cost without adverse effect on weight gain and feed efficiency

REFERENCES

- Al Harthi, M.A. and El Deek, A.A., (2009). Evaluation of sesame meal replacement in broiler diets with phytase and probiotic supplementation. Egypt. Poul. Sci. J. Vol., 29 No. 1 pp. 99-125
- Association of Official Analytical Chemist, A.O.A.C. (1990). Official Methods of Analysis, 13th Edition, Washington, D. C.
- Babatunde, B.B., R.A. Hamzat and O.O. Adejimi (2001): Replacement value of kolanut husk meal for maize in rabbit diets. Tropical Journal of Animal Science 4 (2): 127 – 133.
- Farran.M.T.G.,Uwayjan, A.M., Ashkarian, V.M., (2000). Performance of broilers and layers fed graded level of sesame hull. J. Appl. Poul. Res., 9, 453-459.
- Omole, A.J., Ajasin, F.O., Oluokun, J.A. and Tihamiyu, A.K. (2007). Rabbit Farming without Tears. Green Choice Publications: 41pgs. ISBN – 978-070-186- 5.

Owen, O. J., Amakiri, A. O., and Ngodigha, E. M.,
(2009). Physiological responses of weaner
rabbits fed graded levels of poultry litter.

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(NSAP), 15th – 18th March, 2009

Table 1: Gross Composition of the Experimental Diet.

Ingredient (%)	SSM ₁ (0% SSM)	SSM ₂ (50% SMM)	SSM ₃ (75% SSM)	SSM ₄ (100% SSM)
Maize	32.0	32.0	32.0	32.0
Groundnut cake	10.0	5.0	2.5	0.0
Sesame seed meal	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 (%)	16.13	16.25	16.38	16.44
Metabolizable energy (kcal/KgME)	2628.1	2614.65	2609.3	2587.67

*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.

Table 2: Determined Proximate Composition of the SSM and the Experimental diets

Parameters	SSM	Ground nut cake meal	SSM ₁ (0% SSM)	SSM ₂ (50% SMM)	SSM ₃ (75% SSM)	SSM ₄ (100% SSM)
Dry matter	97.72	96.24	95.92	94.38	94.89	93.80
Crude Protein	48.87	45.36	16.02	16.34	16.54	16.74
Crude Fibre	2.75	3.28	11.36	11.11	11.02	10.91
Ether Extract	4.23	5.56	5.53	5.46	5.32	5.18
Ash	6.64	7.78	12.91	12.65	12.54	12.33
Nitrogen Free Extract	37.51	40.02	54.21	54.44	54.58	61.9

SSM- Sesame seed meal

Table 3: Performance and cost benefits of weaned rabbit fed different levels of SSM in the diet.

Parameters (Mean values)	SSM ₁ (0% SSM)	SSM ₂ (50% SMM)	SSM ₃ (75% SSM)	SSM ₄ (100% SSM)	± SEM
Initial weight (g)	516.34	513.90	517.21	515.09	5.89
Final weight (g/16weeks)	2707.54	2708.7	2715.44	2720.54	31.56
Total weight gain (g/16weeks)	2191.2	2194.8	2198.23	2205.45	21.12
Daily weight gain (g)	18.26	18.29	18.32	18.38	1.78
Daily feed intake (g)	82.4	82.5	82.59	82.61	2.67
Feed conversion ratio	4.51	4.51	4.50	4.49	0.36
Cost/kg feed (N)	51.64 ^a	49.40 ^b	47.89 ^c	46.12 ^d	2.01
Total feed cost (N/kg)	510.71 ^a	489.06 ^b	474.58 ^c	457.04 ^d	8.91
Cost/weight gain (N/kg)	233.20 ^a	215.71 ^b	215.71 ^c	206.80 ^d	6.24

Means along rows with different superscript are significantly different from each other (P<0.05), SSM- Sesame seed meal