

## APRW -01

### Nutrient Composition of Sesame Seed Cake and its Effect on the Growth Performance and Carcass Characteristics of Rabbits

W. Abdulsalam<sup>1</sup>, I. C. Alameda<sup>2</sup>, J. Y. Adama<sup>2</sup>

<sup>1</sup>Department of Animal Health and Production Technology, Niger State College of Agriculture, Mokwa, Nigeria

<sup>2</sup>Department of Animal Production, Federal University of Technology, Minna, Niger State, Nigeria

**Corresponding author:** W. Abdulsalam; E-mail: wosilatnike@gmail.com; Tel: +2348057073678

#### Abstract

In a twenty-four week feeding experiment, 45 weaner rabbits of mixed breeds with an average weight of 722-750 g were used to evaluate the effect of inclusion of different dietary levels of sesame seed cake (SSC) diets on growth performance and carcass characteristics of growing rabbits. The rabbits were randomly assigned to the diets in a completely randomized design with nine rabbits per treatment at three rabbits per replicate and fed with diets containing 0, 25, 50, 75 and 100 % SSC designated as T1 (control), T2, T3, T4 and T5, respectively. After a two-week stabilization period, data on body weight and feed intake were collected from the experimental animals on weekly basis. At the end of the 8 weeks feeding trial, three rabbits per treatment, were slaughtered for carcass evaluation and analysis. Results obtained indicated that feed intake was significantly higher ( $p < 0.05$ ) for rabbits on treatment 50% SSC. There was increasing trend of body weight gain from control to higher level of sesame seed cake supplementation i.e. T1 (380.52 g), T2 (450.00 g), T3 (480.56 g), T4 (450.00 g) and T5 (530.55 g). The control treatment had higher feed conversion ratio than the supplemented treatments, rabbits on 100% SSC diet has lowest FCR. The results of carcass characteristics showed significant differences among treatments ( $p < 0.05$ ) for slaughter weight, dressed weight, dressing percentage, head weight, fore limb and tail weight. The dressed weight and dressing percentage were high in the group receiving 50 % SSC. The organ characteristics studied did not differ between treatments ( $p > 0.05$ ), except for the heart weight that showed significant ( $p < 0.05$ ) difference among treatment groups. The study revealed that sesame seed cake is rich in protein and could be used as a partial or total replacement as protein source without any adverse effect on weaner rabbits.

#### Introduction

The demand for protein of animal origin in Nigeria is greater than the quantity that is been supplied (Akinmutimi and Onwukwe, 2002). This acute shortage of animal protein in the diet of many Nigerians has resulted in efforts been directed towards livestock that are prolific and have short gestation interval such as rabbit. According to Odunsi (2003), the fast growing human and livestock population, which is responsible for the increased demand for food and feed in developing countries, demand that alternative feed resources must be identified and evaluated as substitute for the conventional feed source. Usage of other alternative feed source is fast gaining popularity in Nigeria and many other developing countries. One of such feed is sesame seed which is rich in protein, carbohydrates, fibre and some minerals and has amino acid profile with good nutritional value similar to soybean (Omar *et al.*, 2002).

The objective of this study was to determine the nutrient composition of sesame seed cake and its effect on the growth performance and carcass characteristics of rabbits

#### Materials and Methods

The experiment was conducted at the Rabbitary unit of the Livestock Farm of Niger State College of Agriculture Mokwa. Mokwa is located on latitude 9° 17'41-35°N and longitude 5° 13'14-83°E. White variety of sesame roasted for about 5 minutes at 180 –210 °C and then milled. Oil was pressed out from milled sesame meal and after extracting the oil, the residue was dried in the sun and then milled to obtain the sesame seed cake (NAERLS, 2010). Proximate composition of SSC was determined using standard methods. The data generated were subjected to analysis of variance (ANOVA) of statistical analysis software for windows (SAS 2006).

Significant differences ( $p < 0.05$ ) among treatment means were determined using Duncan's Multiple Range Test, Duncan, (1955).

Table: Gross Composition of Experimental Diets

Ingredients	T1	T2	T3	T4	T5
Maize	44.95	44.95	44.95	44.95	44.95
Rice offal	20.00	20.00	20.00	20.00	20.00
Maize bran	10.00	10.00	10.00	10.00	10.00
Groundnut cake	18.00	13.50	9.00	4.50	0.00
Sesame seed cake	0.00	4.50	9.00	13.50	18.00
Fish meal	3.00	3.00	3.00	3.00	3.00
Bone meal	3.00	3.00	3.00	3.00	3.00
Vitamin Premix	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25	0.25
Salt	0.30	0.30	0.30	0.30	0.30
TOTAL	100	100	100	100	100
Calculated nutrient composition					
ME (kcal/kg)	2594.60	2599.60	2604.50	2609.50	2614.40
Crude protein	18.28	18.26	18.01	17.88	17.74
Crude fibre	10.09	10.27	10.21	10.15	10.32

T1 = 0 % Sesame seed cake (SSC) T2 = 25 % Sesame seed cake (SSC) T3 = 50 % Sesame seed cake (SSC) T4 = 75 % Sesame seed cake (SSC) T5 = 100 % Sesame seed cake (SSC)

### Results and Discussion

Table 2 shows the proximate composition of both the raw sesame seed and the sesame seed cake. The level of crude protein found in raw sesame seed can qualify it as a good source of protein. The performance characteristics of weaner rabbits fed varying levels of sesame seed cake is as shown in Table 3. The study produced daily feed intake values between 44.89-55.36 g. The values obtained, were fairly a bit higher than the 24.02 – 60.54 g reported by Eshiet *et al.* (1979) in the tropics. The feed conversion ratio values of 6.60, 6.45, 6.12, 5.97 and 5.36 (Table 4)

Table 2: Proximate composition of raw sesame seed and sesame seed cake

Parameters (%)	Raw sesame seed	Sesame seed cake
Moisture Content	4.80	3.60
Crude Protein	19.86	25.50
Crude Fibre	5.71	4.50
Ether Extract	51.67	29.33
Ash	4.22	5.25
Nitrogen Free Extract	14.94	30.6

Table 3. Growth performance of rabbits fed graded levels of sesame seed cake diets

Parameter	T1	T2	T3	T4	T5	SEM
Initial Weight (g)	727.81	727.70	733.33	722.22	733.33	3.12
Final Weight (g)	1108.33	1177.78	1213.89	1172.22	1263.89	3.44
Total Weight Gain (g)	380.52	450.00	480.56	450.00	530.55	3.87
Daily Weight Gain (g)	6.80	8.04	8.58	8.04	9.47	0.52
Daily Feed Intake (g)	44.89 <sup>b</sup>	47.97 <sup>b</sup>	55.36 <sup>a</sup>	49.21 <sup>ab</sup>	50.79 <sup>ab</sup>	0.66
FCR	6.60	5.97	6.45	6.12	5.36	1.03
Mortality (Number)	1	1	1	0	1	0.34

Means in the same row with different superscripts differ significantly (p<0.05)

obtained in this study were higher than the 2.63- 4.00 reported by earlier researchers in the tropics (Okorie, 2003). The higher weight gains in the rabbits fed the SSC diets may be partly due to a better protein quality, possibly arising from a higher methionine and lysine supply (Booth and Wickens, 1988). The results of the carcass and organ characteristics showed the slaughter weight and dressed weight were highest in rabbits fed diets containing 100 % and 75 % sesame seed cake respectively. There were significant differences (p<0.05) among treatments for slaughter weight, dressed weight, dressing percentage, head weight, hind limb weight and tail weight. Treatment diet containing 75 % sesame seed cake recorded highest values for dressed weight, dressing percentage, hind limb weight, loin weight, rack weight and skin pelt. The dressing percentage

obtained is higher than that of Fielding (1991) who stated that the dressing percentage would be 50% or less if the rabbit is young, thin and with a full digestive tract at slaughter. The heart weight differs significantly with diet 50 % SSC having the higher heart weight of 0.20 g and diet 0 % SSC recording the lowest value (0.09 g).

Table 4. Carcass Characteristics of Rabbits Fed Graded Levels of Sesame Seed Cake Diets

Parameters	T1	T2	T3	T4	T5	SEM
Live Weight	1108.33	1177.78	1213.89	1172.22	1263.89	3.44
Slaughter Weight (g)	1060.00 <sup>b</sup>	1140.00 <sup>ab</sup>	1200.00 <sup>a</sup>	1145.00 <sup>a</sup>	1215.00 <sup>a</sup>	2.41
Dressed Weight (g)	750.00 <sup>bc</sup>	650.00 <sup>c</sup>	705.00 <sup>bc</sup>	900.00 <sup>a</sup>	800.00 <sup>ab</sup>	2.44
Dressing Percentage (%)	67.67 <sup>a</sup>	55.19 <sup>b</sup>	58.08 <sup>b</sup>	76.78 <sup>a</sup>	63.30 <sup>ab</sup>	0.70
Body components expressed as percent slaughter weight						
Head Weight (g)	9.97 <sup>ab</sup>	10.53 <sup>a</sup>	9.06 <sup>b</sup>	10.41 <sup>ab</sup>	9.26 <sup>ab</sup>	0.27
Hind Limb Weight (g)	15.97	14.82	14.46	16.64	14.08	0.45
Fore Limb Weight (g)	8.93 <sup>a</sup>	7.30 <sup>b</sup>	8.16 <sup>ab</sup>	8.83 <sup>ab</sup>	8.50 <sup>ab</sup>	0.28
Loin Weight (g)	15.07	13.92	14.62	16.55	13.17	0.38
Rack Weight (g)	12.41	11.80	10.96	14.50	13.17	1.39
Tail Weight (g)	0.14 <sup>b</sup>	0.20 <sup>ab</sup>	0.32 <sup>a</sup>	0.30 <sup>ab</sup>	0.19 <sup>ab</sup>	0.08
Skin Weight (g)	9.83	9.21	9.27	11.13	9.38	0.36
Liver Weight (g)	3.34	2.97	2.97	3.11	3.28	0.17
Heart Weight (g)	0.09 <sup>c</sup>	0.17 <sup>ab</sup>	0.20 <sup>a</sup>	0.13 <sup>bc</sup>	0.16 <sup>ab</sup>	0.52
Kidney Weight (g)	0.63	0.51	0.60	0.60	0.55	0.12
Lung Weight (g)	0.41	0.47	0.63	0.51	0.47	0.13
Spleen Weight (g)	0.03	0.04	0.04	0.05	0.04	0.04
Kidney Fat Weight (g)	0.45	0.47	0.37	0.85	0.55	0.17

Means in the same row with different superscripts differ significantly (p<0.05)

## Conclusion

The experiment showed that up to 100 % dietary levels of sesame seed cake diet could be included in the diet of rabbits. This is based on the findings that performance in body growth and carcass characteristics was comparable to those rabbits on control diet (0 % SSC).

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