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# EVALUATION OF CARCASS CHARACTERISTICS OF BROILER CHICKENS FED GRADED LEVELS OF TREATED SESAME WASTE

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**ABSTRACT**
A total of one hundred and twelve day-old broiler chicks (Amo strains) were used to evaluate carcass traits fed with diets containing graded levels of treated sesame waste and its appropriate level of inclusion in the diet. The experimental birds were randomly allocated to four dietary treatments of 28 birds per treatment and each treatment was replicated four times with seven birds per pen. Results obtained showed that there were significant ($P<0.05$) differences in terms of weight (g), pluck weight (g), carcass weight (g), intestinal weight (g) and liver weight (%). Non-significant ($P<0.05$) difference were observed in terms of intestinal length (cm), wing weight (g), thigh weight (g), head & legs (%), gizzard (%), lungs (%), heart (%) liver (%), kidney (%) and spleen (%).

**Keywords**: Broiler chick, diet, weight, significant

## INTRODUCTION

The increasing demand for animal protein has aroused great interest in the production of fast growing animals with short generation intervals. Obinne and Okorie (2008) reported that expansion of poultry industry in Nigeria holds the greatest promise for bridging the animal protein requirement gap prevailing in the country within the shortest possible time. (Adeyemi, O. A. 2005) reported that protein from poultry meat and egg is of good quality and is used as a standard against which other proteins are compared. Broiler chickens are fast growing specie of poultry that are commonly raised to provide tender meat for human consumption. The availability of cheap and good quality protein sources remains the single most important limiting factor in poultry production in Nigeria (Adeyemi, O. A. 2005).However, the rising cost of poultry feed has continued to be a serious problem. This is because feed alone accounts for about 70% of the total cost of production (Ogundipeet al., 2003). Competition for conventional feedstuffs by man, industry and livestock has contributed immensely to the high cost of these feedstuffs in the local markets. This high cost coupled with inadequate knowledge of possible alternative and cheap ingredients have been the most important factors militating against the increase in commercial poultry production in Nigeria and other developing countries (Olorede and Ajayi, 2005).

## MATERIAL AND METHODS

### Experimental Site

The study was conducted at teaching and research farm of Audu Bako College of Agriculture, Dambatta. The college is located between Dammarke and Shantake villages of Makoda Local Government of Kano State. Kano is a northern State, located within latitude of coordinates $12^0$40N and $10^0$30N, longitudes $7^0$40E and $9^0$30E (Mustapha *et al.*, 2014). The state has an elevation about 472.45 metres above sea level, and is characterized by a hot, semi-arid climate that allows an average annual rainfall of 690mm. it is considered a wet and dry tropical climate based on Koppen Geiger classification (Mustapha *et al.*, 2014).

### Experimental diets

Experimental Diets were formulated to meet standard requirements of the experimental birds. Rations were formulated with graded levels of sesame waste at 0, 7.5, 15 and 22.5%. Table 1and 2 shows the gross ingredients compositions of the starter and finisher diets, respectively.

### Sesame waste processing

Sesame waste was boiled at 100ºC for 30 minutes, sun-dried for 72 hours on a concrete floor with regular turning to prevent moldiness. Samples were then milled and taken to Ahmadu Bello University, Zaria for proximate analysis.

### Experimental design and management of birds

A total of one hundred and twelve-day old broiler chicks (Amo strain) were used for this study, they were randomly allocated to four dietary treatments of 28 birds per treatment and each

treatment was further sub divided into 4 replicates of 7 birds per replicate thereafter, fed with the experimental diets. All experimental birds were reared in a deep litter system equipped with feeders and drinkers, water given *ad libitum*. Heat and light was provided throughout the brooding period, using charcoal and 200 watts' electric bulbs.

**Carcass Analysis**

Carcass evaluation was conducted at the end of the finisher phase (8 weeks). Two (2) birds from each treatment were selected based on the average group body weights. The birds were deprived of feed overnight, but were given water *ad libitum*, thereafter; they were weight using scale. They were sacrificed by a ventral neck cut with a sharp knife, after that they were thoroughly bled and weight and manually de-feathered by scalding in hot water. De- feathered birds were weighed, labeled and eviscerated.

$$\text{Dressing percentage (\%)} = \frac{\text{Dressed weight}}{\text{Live weight}} \times 100$$

**Mortality**

Mortalities was recorded against the respective replicates as and when they occurred throughout the experimental period. Percentage mortality was calculated as;

$$\text{Percentage mortality (\%)} = \frac{\text{Number of dead birds}}{\text{Number of birds per treatment}} \times 100$$

**Statistical Analysis**

The data generated from this experiment was subjected to analysis of variance (ANOVA). Means separation was carried out by using Turkey's Test.

**RESULTS AND DISCUSSION**

The Live weight shows significant difference ($P<0.05$) between treatments and the values obtained ranged from 9.58.87-1114.47 for treatments 4 and 2 respectively this is similar with the report of Mu'azu et al., (2020) who reported 875.67 to 1783.33 in performance of chickens fed different commercial feed in Bauchi. Carcass weight shows significant difference ($P<0.05$) between treatments and values obtained ranged from 776.10 to 983.54 and this was similar with the report of Mu'azu et al., (2020) who reported 875.67 to 1783.33 in performance of chickens fed different commercial feed in Bauchi. Plucked weight showed significant difference ($P<0.05$) between treatments and values obtained ranged from 922.66 to 1295.87 for treatments 4 and 3 respectively. This is in line with the report of Doma et al., (2001) in broilers fed different commercial diets who reported 1027.10 and 1269.17 for treatments 1 and 4 respectively. Feed conversion ratio shows significant difference ($P<0.05$) between treatments and values obtained ranged from 1.45 to 1.56 for treatment 4 and 1 respectively. This is in line with values obtained by Sanusi *et al* (2015). Birds on diet T5 were having better feed conversion ratio of 1.65 which is similar to 1.82 and 1.86 of treatments 4 and 2 respectively. Other parameters measured showed no significant difference ($P>0.05$); dressing percentage, daily feed intake, intestinal weights and lengths, wings, thighs, heads and legs, gizzard, lungs, hearts, liver, kidneys and spleens. Total feed intake shows significant difference ($P>0.05$) between treatments and values obtained ranged from 1.99-2.84. Total weight gained shows significant difference ($P>0.05$) and values ranged from 1.03 to 1.75. This results were contrary with values obtained by Sanusi et al (2015) 124.67 to 190.29. Highest feed cost/kg is recorded in dietary treatments 3 and 5 while all the other dietary treatment had the same feed cost. Total feed cost gain shows significant difference ($P>0.05$) with values 267.45 to 313.24 this was similar with report of Sanusi et al., (2015) values ranged between 260.74 to 3377.70 in dietary groups 5 and 3 respectively. Mortality, feed cost and total feed cost shows no significant difference between treatments.

**Table 1: Composition of Experimental Diets for Broiler Chickens Containing Graded Levels of Treatedat Starter (1-4 Weeks)**

| | | levels of treated sesame waste (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Ingredients** | | **T1 (0%)** | | **T2 (7%)** | | **T3 (15%)** | | **T4 (22.5%)** | |
| Maize | | 56.70 | | 56.70 | | 56.70 | | 56.70 | |
| Soybean | | 29.95 | | 22.95 | | 14.95 | | 7.95 | |
| Sesame waste | | 0.000 | | 7.00 | | 15.00 | | 22.00 | |
| Groundnut cake | | 10.00 | | 10.00 | | 10.00 | | 10.00 | |
| Bone meal | | 2.50 | | 2.50 | | 2.50 | | 2.50 | |
| Premix | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| Salt | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| Lysine | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| Methionine | | 0.10 | | 0.10 | | 0.10 | | 0.10 | |
| **Total** | | **100** | | **100** | | **100** | | **100** | |
| **Calculated analysis % (unless otherwise stated)** | | | | | | | | | |
| Metabolizable Energy | (Kcal/kg) | 2926 | | 2926 | | 2928 | | 2905 | |
| Crude Protein | | 22.03 | | 20.98 | | 20.23 | | 20.29 | |
| Crude Fibre | | 3.86 | | 5.974 | | 8.10 | | 10.29 | |
| Ether Extract | | 4.23 | | 4.91 | | 5.59 | | 6.272 | |

**Table 2: Composition of Experimental Diets for Broiler Chickens Containing Graded Levels of Treatedat Finisher (5-8 Weeks)**

| | levels of treated sesame waste (%) | | | |
|---|---|---|---|---|
| **Ingredients** | **T1 (0%)** | **T2 (7%)** | **T3 (15%)** | **T4 (22%)** |
| Maize | 59.50 | 59.50 | 59.50 | 59.50 |
| Soya bean | 27.40 | 20.40 | 12.40 | 5.40 |
| Sesame waste | 0.00 | 7.00 | 15.00 | 22.00 |
| Groundnut Cake | 9.75 | 9.75 | 9.75 | 9.75 |
| Bone meal | 2.50 | 2.50 | 2.50 | 2.50 |
| Premix | 0.25 | 0.25 | 0.25 | 0.25 |
| Salt | 0.25 | 0.25 | 0.25 | 0.25 |
| Lysine | 0.25 | 0.25 | 0.25 | 0.25 |
| Methionine | 0.10 | 0.10 | 0.10 | 0.10 |
| **Total** | **100** | **100** | **100** | **100** |
| **Calculated analysis % (unless otherwise stated)** | | | | |
| Metabolizable Energy (Kcal/kg) | 2995 | 2936 | 2951 | 2968 |
| Crude Protein | 20.90 | 20.65 | 19.42 | 19.58 |
| Crude Fibre | 3.73 | 5.93 | 8.03 | 10.2 |
| Ether Extract | 4.24 | 4.92 | 5.61 | 6.27 |

**Table 3: Proximate composition of Soya Bean and Treated Sesame Waste**

| **Components** | **Soybean residue (%)** | **Sesame Waste (%)** |
|---|---|---|
| Dry matter | 96.00 | 90.01 |
| Crude protein | 27.0 | 44.58 |
| Crude fibre | 8.44 | 5.00 |
| Ether extract | 5.01 | 6.02 |
| Ash | 6.18 | 5.03 |
| Metabolizable Energy (kcal/kg) | 3254 | 2640 |

**Source; Animal Science Laboratory ABU Zaria.**

**Table 4: Carcass characteristics of broiler chickens Fed Graded Levels of Treated SSW**

| | Treatments | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| **Parameters** | **0%** | **7%** | **15%** | **22%** | **SEM** |
| Live Weight (g) | 1244.66$^{c}$ | 1114.45$^{b}$ | 1337.09$^{d}$ | 958.87$^{a}$ | 54.49$^{**}$ |
| Plucked Weight (g) | 1201.54$^{c}$ | 1078.34$^{b}$ | 1295.87$^{d}$ | 922.66$^{a}$ | 49.67$^{**}$ |
| Carcass weight (g) | 859.56$^{b}$ | 867.87$^{d}$ | 983.54$^{c}$ | 776.10$^{a}$ | 52.70$^{**}$ |
| Dressing % | 75.31 | 75.43 | 79.80 | 76.28 | 25.87$^{NS}$ |
| Daily feed Intake (g) | 47.65 | 44.87 | 46.09 | 42.87 | 10.54$^{NS}$ |
| Feed Conversion Ratio | 1.56 | 1.76 | 1.87 | 1.45 | 0.54$^{**}$ |
| Intestinal Weight (%) | 10.60$^{a}$ | 10.22$^{b}$ | 10.00$^{c}$ | 9.70$^{d}$ | 6.63$^{**}$ |
| Intestinal Length (cm) | 225.90 | 215.99 | 241.08 | 225.08 | 56.09$^{NS}$ |
| Wing (g) | 93.87 | 89.89 | 87.87 | 87.78 | 24.44$^{NS}$ |
| Thigh (g) | 119.87 | 126.65 | 111.87 | 125.32 | 15.51$^{NS}$ |
| Heads & Legs (%) | 11.87 | 11.87 | 11.98 | 11.86 | 1.78$^{NS}$ |
| Gizzard (%) | 1.90 | 1.70 | 1.75 | 1.76 | 0.89$^{NS}$ |
| Lungs (%) | 1.09 | 1.19 | 1.96 | 1.92 | 0.31$^{NS}$ |
| Heart (%) | 0.86 | 0.78 | 085 | 0.76 | 0.39$^{NS}$ |
| Liver (%) | 4.29$^{d}$ | 3.31$^{b}$ | 3.25$^{a}$ | 3.91$^{c}$ | 0.70$^{**}$ |
| Kidney (%) | 1.57 | 1.15 | 1.18 | 1.44 | 0.53$^{NS}$ |
| Spleen (%) | 0.96 | 0.77 | 0.88 | 0.76 | 0.42$^{NS}$ |

abc= means in the same row with different superscript are significantly different(P<0.05).**=P<0.05 level of significance, NS=Not significance, SEM=Standard Error of Mean.

**Table 5: Economics of Broiler Chicks Fed Graded Levels of Treated SSW**

| | Treatments | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| **Parameters** | **0%** | **7%** | **15%** | **22%** | **SEM** |
| Total feed intake (kg) | 1.99$^{d}$ | 2.42$^{c}$ | 2.81$^{b}$ | 2.84$^{a}$ | 0.35$^{**}$ |
| Feed cost (₦/kg) | 148 | 148 | 161 | 163 | 5.62$^{NS}$ |
| Total feed cost (₦) | 322.64$^{d}$ | 372.96$^{c}$ | 375.72$^{b}$ | 389.80$^{a}$ | 44.76$^{**}$ |
| Total weight gain (kg) | 1.03$^{d}$ | 1.35$^{c}$ | 1.73$^{b}$ | 1.75$^{a}$ | 0.28** |
| Feed cost gain (₦/kg gain) | 313.24$^{c}$ | 276.27$^{b}$ | 377.7$^{d}$ | 267.45$^{a}$ | 43.50** |
| Mortality (%) | 0.33 | 0.33 | 0.35 | 0.29 | 12.41$^{NS}$ |

abc= means in the same row with different superscript are significantly different(P<0.05).**=P<0.05 level of significance, NS=Not significance, SEM=Standard Error of Mean.

## CONCLUSION AND RECOMMENDATION

**C**an be concluded that treated sesame waste can be in cooperated in to broiler diet and it can replace well soy bean residues up to 15% level of inclusion without any harm and safe high cost of protein sources.

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