

## CARCASS CHARACTERISTICS OF BROILER CHICKENS FED TWO PLANT PROTEIN SOURCES

<sup>1</sup>Abdulkadir S.; <sup>2</sup>U.D Doma; <sup>2</sup>H.M Mai

<sup>1</sup>Department of Animal Health and Production Technology, College of Animal Health and Agriculture Bakura Zamfara State.

<sup>2,2</sup>Department of Animal Production, Abubakar Tafawa Balewa University, Bauchi, Bauchi State.  
Corresponding author: sakaura86@gmail.com:phone no. 07063060860

### ABSTRACT

This study was conducted to assay the carcass characteristics of broiler chicken fed two plant protein sources. The need to compare the carcass characteristics of these two important plant proteins prompted this research. Two hundred and forty day old broiler chicks were randomly allotted to five experimental diets of 48 birds each in a complete randomized design. The birds were divided into three replicate of 16 birds each and offered experimental diets at 0.0, 5.0, 10.0, 15.0 and 20.0% toasted soya beans corresponding levels respectively. Carcass characteristics was used as criteria of response inclusion of toasted soya bean and groundnut cake, so all the inclusion levels have no adverse effects on the carcass characteristics of broiler chicken. Therefore all levels are recommended and either the toasted soya beans or ground nut cake can be used as an alternative to plant protein source in broiler feeding.

**Keywords:** Carcass Characteristics, Broiler, Toasted Soya bean, Ground nut cake, Plant Protein.

### INTRODUCTION

Broiler business provides a large part of increasing demand for animal protein, cash income, fertilizer and employment opportunities. Although CBN (2019), has reported that the poultry industry is the most commercialized of all Nigeria's agricultural subsectors with a current worth of about N 1.6 trillion, it is yet to attain its full potentials in the country. Also, it has been established that poultry performance in terms of live weight and efficiency of feed utilization and carcass leanness is clearly related to quality and intake levels of particular nutrients especially energy and protein (Nwakpu *et al.*, 1999). Soya beans (SBM) is the primary source of plant protein commonly used in poultry nutrition since its amino acid balance is appropriate for diets (Marsman GJP *et al.*, 2020). Therefore, the use of raw soya beans by monogastric animals is not totally efficient due to the presence of anti-nutritional factors (ANF) (Ebrahimi *et al.*, 2011).

To inactivate or remove ANFs in poultry diets, various heat procedures toasting inclusive have been reported to be efficient in reducing trypsin inhibitor (TIA) and phytic acid (PA) in soya beans (Ari *et al.*, 2011). Habiba (2002) declared that cooking, autoclaving and microwaving are the most successful soybean heat procedures that may have an important role in removing these ANFs. Unfortunately, limited research has been developed on the soya bean heat procedures in poultry performance (Akande *et al.*, 2010). To fill this gap, an experiment was carried out with the aim of investigating the response of broiler chicken fed with toasted soya bean on carcass characterization. This information could be sourced from results of research work, Saminu *et al.*, (2020) monitored the carcass characterization of broiler fed with toasted soya beans and groundnut cake. Toasting method of heating soya beans has shown to reduce the anti-nutritional factors to tolerable levels for broiler production and has no significant changes on the replacement of other plant protein source.

The objective of this study is to evaluate the carcass characteristics of broiler fed with toasted soya beans at graded levels as replacement with ground nut cake in chickens.

## MATERIALS AND METHODS

The experiment was conducted at the teaching and research farm, Abubakar Tafawa Balewa University Yalwa Campus Bauchi, Bauchi State. Soya bean was purchased from Bauchi Commercial Market. The soya bean was toasted. The feed ingredients were milled at University Milling Machine Section.

Five experimental diets were formulated, diet 1(control) had 0 soya beans while diet 2, 3, 4 and 5 had toasted soya beans meal inclusive level of 2.5,5.0,7.5 and 10% respectively.

**Table 1. Quantities of feed ingredient used in the experiment**

| PARAMETERS | T1    | T2    | T3    | T4    | T5    |
|------------|-------|-------|-------|-------|-------|
| MAIZE      | 49.39 | 48.93 | 48.66 | 48.48 | 48.24 |
| GNC        | 35.00 | 33.55 | 31.90 | 30.37 | 28.50 |
| SBC        | 0     | 1.91  | 3.83  | 5.74  | 7.65  |
| WO         | 7.65  | 7.65  | 7.65  | 7.65  | 7.65  |
| FM         | 3.83  | 3.83  | 3.83  | 3.83  | 3.83  |
| PREMIX     | 0.19  | 0.19  | 0.19  | 0.19  | 0.19  |
| SALT       | 0.19  | 0.19  | 0.19  | 0.19  | 0.19  |
| BONE MEAL  | 2.30  | 2.30  | 2.30  | 2.30  | 2.30  |
| LIMESTONE  | 1.15  | 1.15  | 1.15  | 1.15  | 1.15  |
| METHIONINE | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  |
| LYSINE     | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  |

A total of two hundred and forty day old broiler chicks were sourced from a commercial hatchery in Jos and allocated into five dietary treatment (16) birds per replicate and replicated (3) times. All vaccination schedules and management procedures were followed. Feed and water were provided ad-libitum and the experiment lasted for 56 days. Daily feed consumption was recorded and weight gain was measured weekly and mortality was recorded where it occurred. After the experiment, two 2 were selected from each replication making six 6 birds from each treatment, birds were weighted, slaughtered by Halal method of slaughter and immersed in hot water to loosen the feathers. Eviscerated weight and dressed weight taken individually before cutting into different whole sale part as follows; pluck weight, eviscerated weight, carcass weight, dressing percentage, lungs, liver, Abdominal fat, Heart, Kidney, Gizzard, caecum, Head, small intestine, legs, large intestine, pancreas and spleen as illustrated in table 2.

Data were subjected to analysis of variance (ANOVA) using Minitab software.

## RESULT AND DISCUSSION

The result of the average carcass characteristics are shown in the table 1. There was no significance different ( $p < 0.05$ ) variations in the carcass characteristics in either the used of toasted soya beans as source of plant protein and other plant protein source.

**Table 2. Carcass characteristics of broiler chicken fed with different plant protein source**

| Parameter           | T1    | T2    | T3    | T4    | T5    | SEM    | LS |
|---------------------|-------|-------|-------|-------|-------|--------|----|
| Live weight         | 1.57  | 1.58  | 1.63  | 1.60  | 1.53  | 0.10   | NS |
| Plucked weight      | 1.30  | 1.35  | 1.45  | 1.30  | 1.37  | 0.10   | NS |
| Evisceration Weight | 1.09  | 1.20  | 1.13  | 1.12  | 1.12  | 0.07   | NS |
| Carcass weight      | 0.98  | 1.08  | 1.13  | 1.02  | 1.02  | 0.06   | NS |
| Dressing percentage | 62.99 | 68.49 | 63.33 | 63.81 | 66.42 | 2.57   | NS |
| Lungs               | 0.53  | 0.42  | 0.41  | 0.46  | 0.50  | 0.07   | NS |
| Liver               | 1.88  |       | 1.64  | 1.81  | 1.71  | 0.13   | NS |
| Abdominal fat       | 0.81  | 0.97  | 0.19  | 0.83  | 0.69  | 0.23   | NS |
| Heart               | 0.40  | 0.43  | 0.40  | 0.43  | 0.46  | 0.05   | NS |
| Kidney              | 0.19  | 0.12  | 0.21  | 0.17  | 0.16  | 0.05   | NS |
| Gizzard             | 1.80  | 1.88  | 1.80  | 1.87  | 2.17  | 0.21   | NS |
| Caecum              | 0.56  | 0.74  | 0.57  | 0.61  | 0.65  | 0.12   | NS |
| Head                | 2.85  | 3.11  | 2.91  | 3.12  | 3.14  | 0.18   | NS |
| Small intestine     | 4.79  | 4.36  | 4.66  | 5.44  | 4.90  | 0.69   | NS |
| Legs                | 4.01  | 4.64  | 4.47  | 4.50  | 4.91  | 0.43   | NS |
| Large intestine     | 0.11  | 0.11  | 0.21  | 0.20  | 0.17  | 0.04   | NS |
| Pancreas            | 0.18  | 0.16  | 0.19  | 0.23  | 0.24  | 0.03   | NS |
| Spleen              | 0.07  | 0.07  | 0.06  | 0.06  | 0.07  | 0.0038 | NS |

**CONCLUSION**

In conclusion, Groundnut cake can replace toasted soya bean at 20% level without compromising the carcass yield of broiler chickens.

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