APR -11

Minerals Composition of Chicken Meat Floss Produced From Broilers Fed Diets of Low Energy Values

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Abstract
This study was designed to investigate the mineralscomposition of floss prepared from broiler chickens fed low energy diets. Three experimental diets comprising three energy levels of 2400 (A); 2600 (B) and 2800 ME Kcal/Kg (C) were formulated and fed to the chickens. The crude protein of the starter and finisher diets were fixed at 24 and 20%, respectively. A total of 270 day old broiler chicks were weighed and randomly allocated to three treatments (A, B and C) of ninety birds per treatment, each treatment having three replications of thirty birds. At the end of eight (8) weeks, three (3) birds were randomly taken from each replication which was used for the preparation of meat floss.Triplicate samples of the raw and chicken meat floss were analysed for Calcium (Ca) and Magnesium (Mg), Sodium (Na) and Potassium (K). Significantly different means were separated using LSD at 5% level of probability. The results showed that raw meat of poultry broiler fed diet containing 2800 ME Kcal/Kg had the highest values of Ca (50.72 mg/Kg), Na (48.02 mg/Kg), and K (80.96 mg/Kg). Ca, Mg and K recorded significant difference ($p<0.05$) between treatments. Mineral composition of floss from chicken fed diet containing 2800 ME Kcal/Kg had the highest values of Na (48.69 mg/Kg) and K (78.81 mg/Kg). Ca, Mg and Na recorded significant difference ($p<0.05$) between treatments. It was concluded that the raw meat and floss of poultry broilers fed diets containing 2800 ME Kcal/Kg had highest values of Na and K.

Keywords: Broiler, chicken, meat floss, diets, energy levels, minerals composition

Introduction

Broiler chicken is free from religious, social and cultural taboos as associated in cattle and pigs. In Northern Nigeria, *Tsire, Balangu, Dambun-Nama* (floss)*, Kilishi* and *Ragadada* are the commonest meat products. The traditionally processed flossis highly acceptable to consumers because of its soft and tender taste compared to the hard and non-soft *kilishi* product. Floss is easy to prepare and highly relished by consumers (Omojola *et al.,* 2004). The product is mass consumed fast-food whose consumption is invariant with respect to ethnicity, religion, socio-economic factors or sex. The growing importance of flossas an indigenous fast food makes it necessary to obtain information on its composition and to assess its nutritional contributions (Muhammad and Muhammad, 2007).

The study was aimed to examine the minerals composition of chicken meat floss produced from broilers fed diets with low energy levels.

Materials and Methods

The experimental research was conducted at the Poultry Demonstration Farm of the Department of Animal Health and Production, Binyaminu Usman Polytechnic, Hadejia, Jigawa State. Three experimental diets comprising three energy levels of 2400 (A), 2600 (B) and 2800MEKcal/Kg (C) were formulated and fed to the chickens. The crude protein of the starter and finisher diets were fixed at 24 and 20%, respectively.A total of 270 day old broiler chicks of Zartech strain were purchased from an accredited distributor. The chicks on arrival were weighed and randomly allocated to three treatments (A, B and C) of ninety birds per treatment, each treatment having three replications of thirty birds. The birds were managed under deep litter system with wood shaving as litter materials.

The floss were prepared following the methods described by Farouk (1985) as; cutting the raw meat (boneless) in to pieces of approximately 4 by 2.5cm and washed the meat with clean water, mixed the meat with ingredients which included Common salt (*Sodium Chloride*), Alligator pepper (*Afromomum meleginata*), Black pepper (*Piper guineense*), Clove (*Eugenia caryophyllata*), Hot pepper (*Capsicum esculenta*), Seasoning (*Maggi star*), Sweet pepper (*Capsicum annum*), Ginger (*Zingiber officinale*), Onion (*Allium cepa*) and Curry powder (*Murray akoenigii*L.), and boiled for ±90 minutes. After then, the meat was pounded in to shreds using a mortar and pestle,then shallow fried using ground nut oil in a stainless steel pots resulting in a produce, which is brown in colour. Figure I showed the summarized sequential flow of the procedure.

Triplicate samples of the raw and chicken meat floss were taken to Soil Science Laboratory of Bayero University, Kano for the mineral analyses. One gram from each of the three different treatments was inoculated in a vacuum plastic container which was immediately transported to the laboratory for the minerals analysis. After wet digestion, the minerals determined were

Ca and Mg using Atomic Absorption Spectrophotometer (Buck Scientific Model 210 VGP), while Na and K using Flame Photometer.

Data obtained were subjected to Analysis of Variance (ANOVA) using the General Linear Model Univariate Procedure of SPSS 17.0 and significant differences of means were compared using LSD at 5% level of probability.

Raw meat

↓

Cut in to pieces of 4cm by 2.5cm

↓

Wash with clean water

↓

Mix with ingredients

↓

Boil for about ±90 minutes

↓

Pound in to shreds

↓

Fry with ground nut oil

↓

Floss

Fig. I: Chicken meat floss preparation. Source: Eke *et* al., 2012

Resultsand Discussion

The results of the macro minerals composition of raw poultry broiler meat fed low energy levels were presented in table 1. The raw meat of poultry broiler fed diet containing 2800 ME Kcal/Kg had the highest values of Ca, Na and K. There was significant difference ($p<0.05$) between treatments in Ca, Mg and K.The results of the minerals composition of meat floss from poultry broiler fed low energy levels were presented in table 2. The meat floss from poultry broiler fed diet containing 2800 ME Kcal/Kg had the highest values of Na and K. The values of Ca, Na and K were lowest in birds fed 2600 ME Kcal/Kg. Ca, Mg and Na recorded significant difference ($p<0.05$) between treatments.

Table 1: Minerals Composition of Raw Broiler Meat Fed Diets with low Energy Levels

	Energy Levels (ME Kcal/Kg)			
Minerals (mg/Kg)	2400	2600	2800	SE (±)
Ca	43.43^{b}	23.67^{c}	50.72^{a}	1.27
Mg	22.00^{a}	18.32^{b}	16.72^{c}	1.34
Na	30.16^{b}	30.60^{b}	48.02^{a}	1.17
K	32.22^{c}	41.82^{b}	80.96^{a}	1.1

$^{a\text{-}c}$ Means with different superscript differ significantly ($p<0.05$)

Table 2: Minerals Composition of Chicken Meat Floss Produced from Broilers Fed Diets with low Energy Levels

	Energy Levels (ME Kcal/Kg)			
Minerals (mg/Kg)	2400	2600	2800	SE (±)
Ca	102.92^{a}	56.76^{c}	80.05^{b}	1.70
Mg	38.84^{b}	55.73^{a}	27.58^{c}	1.50
Na	44.42^{b}	40.63^{c}	48.69^{a}	1.24
K	65.24^{b}	64.67^{b}	78.81^{a}	1.36

$^{a\text{-}c}$ Means with different superscript differ significantly ($p<0.05$)

Poultry derives the minerals required for normal growth and metabolism from the diet. The biological availability of a mineral from the diet is manifested by the efficiency with which the body utilizes and retains the dietary mineral. The retention will be influenced by a number of dietary factors, including diet or ingredient type, source of minerals and, levels and relative proportions of various minerals (Thomas and Ravindran, 2017). Ogunwole *et al*. (2014) reported Ca range in raw chicken meat between 29.12 to 33.08 mg/kg which were within the range found in this research. The work of Eniola *et al*. (2017) who reported significant differences in Ca and Fe between treatments in the raw meat of domesticated and Wild Grass-cutter agrees with this finding. Ca, Mg and Na values of raw meat obtained in this research is in line with the finding of Yasmine (2009). The significant differences (P<0.05) in Ca and Mg values as reported by Ogunwole *et al*. (2013) were similar to what was reported in this study. The same authors reported Ca values (33.00 to 35.58 mg/kg) which agrees with the findings of this work.Umar and Muhammad (2011) reported highest values of K as 71.75 for raw meat, 60.44 for *Tsire* and 78.06mg/Kg for *Balangu* which was similar to this report. The Ca value of meat floss obtained from birds fed 2, 400 ME Kcal/Kg is relatively similar to what was reported by Jokanovic *et al.* (2014). The K content of chicken meat floss in all the treatments is relatively the same with the findings of Umar and Muhammad (2011) who reported 60.44and 78.06mg/Kg for *Tsire* and *Balangu*, respectively.

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