



(RESEARCH ARTICLE)



Carcass characteristics of broiler chickens fed varying dietary levels of *Ficus thonningii* leaf meal

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Abstract

The feeding trial was conducted to determine carcass characteristics of broiler chickens fed varying dietary levels of *Ficus thonningii* leaf meal. A total of ninety six (96) four weeks old broilers were used for the feeding trial. The birds were randomly assigned to four treatments namely; 0 g/kg (control) for T₁, 2 g/kg for T₂, 3.5 g/kg for T₃, and 5 g/kg for T₄ *Ficus thonningii* leaf meal in the diets, respectively. Each treatment had 24 birds and 8 birds per replicate. The results showed that treatment significantly affected live weight and carcass yield. The live weight for broiler chickens ranged from 2,420.00 g - 2,870.00 g with T₁ (control) having the highest mean live weight of 2,870 g. Under the conditions of the present experiment, it may be concluded that the inclusion of *Ficus thonningii* leaf meal in broiler diets can promote carcass yield benefits when compared with the control. It was recommended that *Ficus thonningii* leaf meal can be included in the diet of broiler chickens up to 5 g/kg level for optimum performance

Keywords: Broilers; *Ficus thonningii*; Liveweight; Carcass; Performance

1. Introduction

In Nigeria, commercial poultry meat production is expanding day by day. There is also a tremendous scope and opportunity for the Nigerian poultry industry to make profit. However, the recent hike in the prices of conventional feed ingredients is a major factor affecting net return from the poultry business. The incorporation of protein from leaf sources in diets for broilers is fast gaining ground because of its availability, abundance and relatively reduced cost [1]. According to Ravindra [2], leaf meals do not only serve as protein sources but also provide some necessary vitamins, minerals and also oxycarotenoids which cause yellow colour of broiler skin, shank and egg yolk. Broiler chickens' production has long been recognized as one of the quickest ways of rapid increase in protein supply within a short time. This is because it has a faster growth rate than other livestock. Animal protein source like mutton is very expensive and beef has a limited use due to its high cholesterol content [3]. Furthermore, Mahmood *et al.* [3] also reported that broiler meat helps in bridging the gap between the supply and demand of animal protein because it is the quickest and most economical source of human food of high biological value. It is believed that 70 to 75 percent of total cost of broiler production is incurred on feed cost, hence alternative means of lowering the cost of broiler production should be sought in other to increase the profitability of poultry farming [4].

Ficus thonningii is found naturally as dry season fodder to be used by smallholder farmers for ruminant livestock. In addition, some farmers also practice planting of *F. thonningii* in the backyard and farmland as a mitigation strategy for dry season feed. Bankole and Ikhatua [5] indicated that the mean crude protein (CP) content of *Ficus* specie was consistent with reported CP of browse in tropical West Africa. According to Bankole and Ikhatua [5], *Ficus thonningii* leaves have good nutrient profile particularly proteins, vitamin and minerals for livestock feeding and that the level of anti-nutritional factor is low, which could guarantee good animal performance. This present trial was therefore

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designed to determine the carcass characteristics of broiler chickens fed varying dietary levels of *Ficus thonningii* leaf meal.

2. Material and methods

2.1. Experimental site

The study was carried out at the Poultry Unit of the Teaching and Research Farm of the Department of Animal Production, Kogi State University, Anyigba. Anyigba is located on Latitude 7°30'N of the equator and Longitude 7°09'E of the Greenwich meridian and with an average altitude of 420 meters above the sea level. The study area falls within tropical wet and dry climate region of the Guinea savanna, with average annual rainfall of 1600 mm and daily temperature range of about 25 °C - 35 °C [6].

2.2. Experimental birds and management

A total of ninety six (96) day old birds were procured from a reliable hatchery for the feeding trial. The birds were fed with standard commercial broiler diet for the first four weeks, during which time, the birds were vaccinated against Newcastle disease with a Lentogenic strain of Newcastle disease vaccine (LaSota). The birds were also dewormed and administered antibiotics before the commencement of the feeding trial. At four weeks of age, the birds were randomly assigned to four dietary treatments. Each treatment was replicated three times with eight birds per replicate.

2.3. Experimental diets

Fresh leaves of *Ficus thonningii* were harvested together with their petiole and dried under shade to preserve their greenish colour. The leaves were milled after practical dryness was achieved and stored for use. The control diet (T₁) had no *Ficus thonningii* while diets T₂, T₃ and T₄ contained 2 g/kg, 3.5 g/kg and 5 g/kg, of *Ficus thonningii* respectively as additive.

Table 1 Chemical Composition of *Ficus thonningii* leave meal

Parameters	Percentage
Moisture content	16.63
Crude Protein	17.15
Crude Fibre	5.60
Ether Extract	4.66
Ash	16.48
Nitrogen free extract	39.48

Table 2 Proximate Composition of Experimental Feed

Parameters	Percentage
Moisture	15.55
Crude Protein	17.41
Crude Fibre	6.90
Ether Extract	7.65
Ash	5.50
Nitrogen free extract	46.99

2.4. Experimental design

The birds were randomly assigned to the four treatments in a Completely Randomized Design. Each treatment had 24 birds and 8 birds per replicate.

2.5. Carcass parameters

To determine the carcass characteristics two birds from each replicate were randomly picked and processed for carcass and organ analysis. The selected birds were slaughtered after an overnight feed withdrawal period. The carcass parameters were; live weight, carcass weight, dressing percentage, wings weight, breast weight, liver weight, drum stick, heart weight, kidney weight, gizzard weight.

2.6. Statistical analysis

Data obtained from the experiment were subjected to one way analysis of variance using Statistical Package of Social Sciences (SPSS) version 20. Least significant difference (LSD) was used to separate significant differences among treatment means at 5 % level of significance.

3. Results and discussion

3.1. Carcass characteristics of broilers chicken fed varying levels of *Ficus thonningii*

The result of the carcass characteristics indices of broilers chicken fed varying levels of *Ficus thonningii* is shown in Table 3. The live weight for broiler chickens ranged from 2420.00 g - 2870.00 g with T₁ (control) having the highest mean live weight of 2870 g. Birds in T₂ were statistically smaller than those in T₁, T₃ and T₄. This observation is contrary to the findings of Denli *et al.* [7] who reported that live weight was not affected by probiotic (P>0.05). Carcass weight was significantly (p<0.05) affected by treatments with a range of 1814.67-2200.33 g. This does not agree with Ngoka *et al.* [8] who reported a carcass weight range of 940-1060 g. This variation might be associated with individual differences in glycogen stores in the muscle. This report is in line with the findings of [7] who reported that carcass yield was influenced by probiotic (p<0.05).

The relative weights of kidney, heart and gizzards) were not affected by treatments. However, the liver was. This may be as a result of different concentrations of anti-nutritional factors due to *Ficus thonningii* leaf meal as the liver had to detoxify any abnormal concentration of anti-nutritional factors due to increasing level of *Ficus thonningii* leaf meal. Some anti-nutritional factors and their breakdown products may have beneficial effect if present in small concentration; however, at high concentration (beyond tolerable levels), they may produce certain harmful effects. Nonetheless, it could be inferred from this trial that utilization of *Ficus thonningii* leaf meal in broiler diet has no deleterious influence on the organ proportions of chickens within the confines of the inclusion levels studied.

Table 3 Carcass characteristics of chickens fed varying levels of *Ficus thonningii* leaf meal

Parameters	T ₁ (0 g/kg)	T ₂ (2 g/kg)	T ₃ (3.5 g/kg)	T ₄ (5 g/kg)	S.E.M	L.O.S
Live Weight (g/kg)	2870.00 ^a	2420.00 ^b	2850.00 ^a	2800.00 ^a	103.10	*
Carcass Weight (g)	2002.00 ^b	1814.67 ^c	2200.33 ^a	1922.00 ^b	106.97	*
Dressing Percentage (%)	69.76 ^c	74.99 ^b	77.91 ^a	68.64 ^c	2.19	*
Drum Stick (%)	10.13 ^b	10.21 ^b	12.53 ^a	10.10 ^b	0.39	*
Wing Weight (%)	7.67 ^d	8.33 ^b	8.56 ^a	7.99 ^c	0.19	*
Breast (%)	23.44 ^c	26.64 ^b	28.28 ^a	27.13 ^b	1.04	*
Liver (%)	1.63 ^c	1.86 ^b	1.93 ^b	2.08 ^a	0.10	*
Heart (%)	0.44	0.42	0.43	0.46	0.03	NS
Kidney (%)	0.12	0.13	0.11	0.14	0.02	NS
Gizzard (%)	2.93	3.10	2.89	3.10	0.26	NS

^{abc} =Means with different superscript on the same row differ significantly (p<0.05); *...Significant (p<0.05);SEM... Standard error of means; LOS....Level of significance; N.S...Not significant

4. Conclusion

Ficus thonningii leaf meal even at 5 g/kg inclusion level supports live weight and carcass characteristics of broiler chicken. It may be concluded that the inclusion of *Ficus thonningii* leaf meal in broiler diets promotes carcass yield when compared with the control. It is recommended that *Ficus thonningii* leaf meal can be included in the diet of broiler chickens up to 5 g/kg level.

Compliance with ethical standards

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Disclosure of conflict of interest

The Author hereby declares that no conflict of interest exist.

Statement of ethical approval

The research complied with the ethical standards of Kogi State University, Anyigba, Nigeria.

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