

ANIMAL NUTRITION

Effects of *Chromolaena odorata* and *Aspilia africana* Extract Blends on Broiler Carcass Characteristics

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Abstract

This study evaluated the carcass characteristics of broiler chickens administered different doses of combined *Chromolaena odorata* and *Aspilia africana* leaf extracts through drinking water. A total of 220 day-old Ross 308 broiler chicks were raised for 42 days and assigned to five treatment groups receiving 0, 5, 10, 15 and 20 ml of the additive per litre of drinking water. At the end of the experiment, 20 birds, one per replicate and closest to the treatment mean weight, were selected for carcass evaluation following a 12-hour fast with access to water. Data were analysed using analysis of variance (ANOVA), and treatment means were separated using Duncan's New Multiple Range Test at a 5% significance level. The results showed that the 15 ml/L treatment recorded the highest bleeding percentage (97.00%), dressing percentage (76.00%), breast yield (25.00%), back yield (13.50%), thigh yield (10.60%), drumstick yield (9.90%) and wing yield (8.10%). However, the highest head yield (3.07%) and shank yield (2.80%) were recorded at 20 and 15 ml/L, respectively, while the highest neck yield (3.80%) occurred at 15 ml/L. The lowest dressing percentage (72.78%) and breast yield (23.06%) were recorded at 5 ml/L. Overall, the 15 ml/L dose produced the most favourable response in the major carcass yield parameters evaluated. It is therefore the most promising of the tested doses for improving carcass yield in broiler chickens under the conditions of this study.

Keywords: *Aspilia africana*; broiler chickens; carcass characteristics; *Chromolaena odorata*; phyto-genic additive; dressing percentage

1 Introduction

Carcass characteristics are important indicators of meat yield, processing efficiency and the economic value of broiler chickens. Traits such as dressing percentage, breast yield, thigh, drumstick, back and wing proportions determine the quantity and distribution of saleable meat obtained from a bird. Improving these traits is particularly important in Nigeria, where high feed costs account for a substantial proportion of broiler production expenses, making efficient conversion of nutrients into marketable carcass components essential for profitability.

Phyto-genic additives derived from medicinal plants have attracted increasing attention as potential alternatives to antibiotic growth promoters in poultry production. Their bioactive compounds, including flavonoids, tannins and phenolic substances, may support nutrient digestion, antioxidant activity, gut health and physiological functions that influence tissue development and carcass composition. *Chromolaena odorata* and *Aspilia africana* are two locally available plants with reported antimicrobial, antioxidant and other biological properties. Their extracts have demonstrated potential for improving poultry productivity, making their combined application through drinking water worthy of investigation.

However, the response of broiler chickens to phytogetic additives may depend on the concentration administered, the composition of the extracts and the interactions among their bioactive constituents. Low doses may not provide sufficient bioactive compounds to produce the desired response, whereas higher doses may not necessarily result in proportional improvements. Consequently, determining the appropriate inclusion level is essential for achieving favourable carcass development without unnecessary additive use. Although previous studies have investigated plant extracts as poultry growth promoters, the optimum dosage of the combined *C. odorata* and *A. africana* leaf extracts for enhancing carcass characteristics requires further evaluation.

Therefore, this study evaluated the carcass characteristics of broiler chickens administered different doses (0, 5, 10, 15 and 20 ml/L of drinking water) of the combined *C. odorata* and *A. africana* leaf extracts. The assessment focused on bleeding and dressing percentages, as well as the relative yields of the head, neck, breast, back, thigh, drumstick, shank, wings and vent, to determine the dose associated with the most favourable carcass response.

2 Materials and methods

The experiment was conducted at the Teaching and Research Farm, Department of Animal Science and Technology, Federal University of Technology, Owerri, Imo State, Nigeria. A total of 220 day-old Ross 308 broiler chicks were raised for 42 days on formulated prestarter, starter and finisher diets. The birds received a combined *Chromolaena odorata* and *Aspilia africana* leaf-extract additive (CA1) at 0, 5, 10, 15 and 20 ml/L of drinking water in a completely randomized design. On day 42, 20 birds, one per replicate and closest to the treatment mean weight, were selected and fasted for 12 hours with access to water. The birds were weighed, slaughtered by severing the jugular veins, bled and dressed. Bleeding and dressing percentages and the relative weights of the head, neck, breast, back, thigh, drumstick, shank, wings and vent were determined and expressed as percentages of live weight. Data were analysed using analysis of variance (ANOVA), and treatment means were separated using Duncan's New Multiple Range Test (DNMRT) at a 5% significance level using R software.

3 Results and discussion

The carcass characteristics (Table 1) showed a distinct dose-related response to the *Chromolaena odorata*-*Aspilia africana* (CO-AA) additive administered through drinking water. The response was not strictly linear because most of the economically important carcass traits declined at 5 ml/L, increased at 10 ml/L, reached their highest values at 15 ml/L, and subsequently declined at 20 ml/L. For example, dressed percentage decreased from 73.82% in the control to 72.78% at 5 ml/L, increased to 73.39% at 10 ml/L, peaked at 76.00% at 15 ml/L and declined to 73.54% at 20 ml/L. A similar pattern occurred for breast yield, which changed from 23.82% in the control to 23.06%, 23.39%, 25.00% and 23.54% at 5, 10, 15 and 20 ml/L, respectively. Back, thigh, drumstick and wing percentages also attained their highest values at 15 ml/L before declining at 20 ml/L. The pattern therefore suggests an intermediate-dose response, with 15 ml/L associated with the greatest carcass development, while the additional increase to 20 ml/L did not produce a further improvement. This is important because it indicates that increasing the concentration of the phytogetic additive does not necessarily produce a proportional increase in carcass yield. Similar dose-specific responses have been reported for plant extracts administered in drinking water. [Akinduro and Asaniyan \(2021\)](#) observed that roselle extract administered at 0, 5, 10, 20 and 30 ml/L produced differences in carcass traits, with the major prime cuts responding particularly at 20 and 30 ml/L. [Tiough et al. \(2025\)](#) like-

wise reported significant differences in carcass characteristics when neem, pawpaw, moringa and thyme phytobiotics were supplied through drinking water, with some treatments producing greater breast, thigh, drumstick and wing yields.

Table 1. Carcass characteristics (% of live weight) of broiler chickens offered different doses of the *Chromolaena odorata* and *Aspilia africana* leaf-extract additive (CA1) in drinking water.

Parameter	0 ml/L	5 ml/L	10 ml/L	15 ml/L	20 ml/L	SEM
Bled	96.60 ^b	96.39 ^e	96.51 ^d	97.00 ^a	96.56 ^c	0.05
Dressed	73.82 ^b	72.78 ^e	73.39 ^d	76.00 ^a	73.54 ^c	0.25
Head	3.04 ^e	3.06 ^c	3.06 ^b	3.05 ^d	3.07 ^a	0.00
Neck	3.77 ^c	3.78 ^b	3.76 ^d	3.80 ^a	3.76 ^e	0.00
Breast	23.82 ^b	23.06 ^e	23.39 ^d	25.00 ^a	23.54 ^c	0.15
Back	13.35 ^b	13.33 ^c	13.33 ^c	13.50 ^a	13.33 ^c	0.01
Thigh	10.37 ^b	10.22 ^e	10.27 ^d	10.60 ^a	10.32 ^c	0.03
Drumstick	9.69 ^b	9.56 ^e	9.57 ^d	9.90 ^a	9.63 ^c	0.03
Shank	2.77 ^c	2.78 ^b	2.74 ^e	2.80 ^a	2.75 ^d	0.00
Wings	7.85 ^c	7.89 ^b	7.85 ^d	8.10 ^a	7.83 ^e	0.02
Vent	2.30 ^a	2.17 ^e	2.20 ^d	2.30 ^b	2.28 ^c	0.01

SEM = standard error of the mean.

The present findings also differ from the results of Erener et al. (2023), who supplied olive-leaf infusion at 5, 10, 15 and 20 ml/L drinking water and found no significant effect on carcass characteristics across the doses. This difference indicates that carcass response is influenced not only by concentration but also by the plant species, phytochemical composition and extraction procedure. Similarly, Onunkwo et al. (2022) reported significant differences in carcass and internal-organ characteristics among broilers receiving different medicinal plant methanol extracts through drinking water. Dabai et al. (2021) also observed improved weight gain and dressing response following carrot-leaf extract administration through drinking water, although most individual carcass components were not significantly affected.

The superior carcass response at 15 ml/L therefore represents a concentration at which the bioactive constituents of the CO-AA combination produced an observable production response without the further increase in concentration translating into additional carcass deposition.

4 Conclusion

The study showed that the combined *Chromolaena odorata* and *Aspilia africana* leaf-extract additive influenced the carcass characteristics of broiler chickens, with 15 ml/L of drinking water producing the most favourable overall carcass response. At this dose, the highest bleeding percentage (97.00%), dressing percentage (76.00%), breast yield (25.00%), back yield (13.50%), thigh yield (10.60%), drumstick yield (9.90%) and wing yield (8.10%) were recorded. Increasing the dose to 20 ml/L did not produce further improvements in these traits. Therefore, 15 ml/L was the most promising dose among those evaluated for improving carcass yield and major meat cuts in broiler chickens.

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