

Effect of Selected Culinary Ingredients on Growth Performance and Carcass Quality of Broiler Chicken

*Abdurrauf-Babalola, A. A., Ibrahim, Z. M. and Olaniyan, A. C.

Department of Animal sciences, Faculty of Agriculture, University of Abuja, Nigeria.

*Correspondence: azeezahabdurraufb@gmail.com, 08055359573

ABSTRACT

The growth performance and carcass qualities of one hundred and twenty (120) day old Ross strain of broiler chicken given aqueous extracts of pooled selected culinary ingredients (bitter leaf bryophyllum, garlic, and tomato) were assessed for forty-two (42) days. The aqueous extract was obtained by infusion of 50g of the pooled culinary ingredients in one (1) liter of boiled water for twelve (12) hours. Using a completely randomized experimental design, the birds were randomly assigned to four (4) treatment groups, each with three replicates of ten birds (10). Varying levels of the aqueous extract were added to their drinking water as; treatments T1 (0ml), T2 (10ml), T3 (15ml) and T4 (20ml) each per litre of water. The results revealed significant differences ($P < 0.05$) in Average Daily Feed Intake (ADFI) and Feed Conversion Ratios (FCR) with T2 having the least (59.17g, 1.33). The carcass quality favoured T3 with the eviscerated weight ($P < 0.05$) having the highest value (1432.00g), carcass weight (1319.00g), and breast weight (447.67g), T2 had the list while other parameters followed a similar trend. It was concluded that the aqueous extract of the culinary ingredients can be added in water at 10mls to enable nutrient utilization of feed and at 15ml to enhance quality carcass.

Keywords: Aqueous extract, broilers, carcass quality, culinary, growth performances.

Description of Problem

The Poultry industry in Nigeria is facing some challenges, one of which is an increase in the cost of feed, diseases, high cost of drug, as well as its indiscriminate use [1]. In the tropics, the problem of diseases are mostly combated with the use of vaccines and drugs, which invariably Antibiotics are among the most important discoveries of the 20th century, having saved millions of lives from infectious diseases. Microbes have developed antimicrobial resistance (AMR) to many drugs due to high selection pressure from increasing use and misuse of antibiotics over the years [3]. This issue has prompted the search for herbal preparations (medicinal plants and culinary ingredients) which are safe, cheap, reduce mortality and maintain optimal animal growth [4]. *V. amygdalina* can serve as a growth promoter and as spice in human and animal diets [5]. Natural plant extracts improve meat

add to the cost of poultry production. Alternative solutions are being sought worldwide to the use of drugs especially antibiotics, since most of them are synthetic and resistant strains of organisms are emerging [2].

texture and juiciness by modulating muscle metabolism and reducing stress-related effects in poultry [6].

These natural additives improve meat composition by reducing fat deposition, increasing protein content, and enhancing antioxidant capacity [7]. Thus, the main objective of this study is to determine the growth performance and carcass quality of broiler chickens administered aqueous extract of selected culinary ingredients (*V. amygdalina*, *B. Pinnatum*, *A. sativum* and *S. lycopersicum* L.).

Materials and Methods

along Airport Road, Federal Capital Territory, Abuja, Nigeria.

Preparation of aqueous extract

Fresh bitter leaf (*V. amygdalina*), bryophyllum (*B. pinnatum*), garlic (*A. sativum*) and tomato

Experimental site

The experiment was carried out at the University of Abuja, Faculty of Agriculture Teaching and Research Farm, main campus

fruit (*S. lycopersicum L.*) were obtained from a nearby market in Abuja, Nigeria. It was sorted, rinsed using running water, weighed, chopped into smaller pieces, air-dried under room temperature to a constant weight. Then ground into fine powder separately and 12.5g of each

Experimental birds and management

A total of 120 day-old broiler chicks were purchased from a reputable hatchery raised up for six weeks in an intensive deep litter system and fed *ad libitum*. The birds were allotted into four treatments groups containing 30 birds each which is separated into 3 replicates in a completely randomized design (CRD)

The aqueous extract of the culinary ingredients was included in their drinking water at the following levels per litre of water:

Data collection

Data were collected on growth performance traits (Daily body weight, weight gain, feed intake, final body weight, feed conversion ratio and mortality). On the 42nd day, 2 birds were randomly selected per replicate, weighed, slaughtered and eviscerated. Head and legs

Result and Discussion

The growth performance as shown in Table 1. The results revealed significant differences ($P < 0.05$) in Average Daily Feed Intake (ADFI) and Feed Conversion Ratios (FCR) with T2 having the least (59.17g, 1.33).

Carcass qualities, Table 2 shows that the aqueous extract does not have a significant

culinary ingredients were pooled together such that 50g of pooled ingredients was infused into 1litre of warm water overnight and filtered to get the aqueous extract which was administered to the chicken at varying levels. This procedure is in accordance with Leila [8].

Treatment 1 at 0ml (control),

Treatment 2 at 10ml,

Treatment 3 at 15ml,

Treatment 4 at 20ml respectively.

The birds were brooded for 21 days with a commercial chick starter diet. The control group were vaccinated and given medications as at when due.

were removed and weighed to determine the carcass weight.

Data analysis

The data obtained were subjected to a One-way Analysis of variance (ANOVA) and means were separated using Duncan Multiple Range Test.

effect ($P > 0.05$) on most of the carcass parameters measured except the eviscerated, carcass, breast and neck weights. The carcass quality favoured T3 with the eviscerated weight ($P < 0.05$) having the highest value (1432.00g), carcass weight (1319.00g), and breast weight (447.67g), T2 had the list while other parameters followed a similar trend.

Table 1: Effect of aqueous extract of selected culinary ingredient on the growth performance of broiler chicken

Parameters	T1	T2	T3	T4	SEM
IBW(g)	41.00	42.00	40.00	41.00	0.21
FBW (g)	1876.33	1744.00	1774.33	1759.33	22.95
WG (g)	1835.33	1702.00	1733.33	1718.33	22.99
ADWG(g)	41.33	38.67	39.33	39.00	0.48
ADFI (g)	67.74 ^b	59.17 ^a	62.60 ^a	63.67 ^{ab}	1.12
MORTALITY	0.00	1.67	2.67	3.00	0.52
FCR	2.00 ^b	1.33 ^a	2.00 ^b	2.00 ^b	0.11

^{ab} means on the same row with different superscripts are significantly ($P < 0.05$) different.

IBW: initial body weight, FBW: final body weight, WG: weight gain, ADWG: Average weight gain, AFI: Average feed intake, FCR: Feed conversion ratio, SEM: standard error of mean.

Table 2: Effect of aqueous extract of selected culinary ingredients on the carcass quality of broiler chicken

Parameters (g)	T1	T2	T3	T4	SEM
Live Weight	1644.67	1597.00	1759.67	1672.67	29.71
Dressed Weight	1526.67	1470.67	1622.33	1518.00	26.39
Eviscerated Weight	1336.67 ^{ab}	1173.67 ^b	1432.00 ^a	1314.17 ^{ab}	34.55
Carcass Weight	1228.67 ^a	1071.67 ^b	1319.00 ^a	1203.67 ^{ab}	32.74
Leg	64.33	59.33	68.33	70.00	2.10
Back	236.00	275.67	255.67	230.67	10.14
Head	43.67	42.67	46.00	41.33	1.56
Breast	406.00 ^{ab}	382.00 ^b	447.67 ^a	420.67 ^{ab}	9.81
Drumstick	180.67	160.67	184.67	175.33	6.59
Thigh	192.33	194.00	198.67	205.67	5.36
Neck	58.67 ^a	37.33 ^b	65.67 ^a	51.00 ^{ab}	4.00

^{ab} means on the same row followed by different superscripts are significantly ($P < 0.05$) different.

Conclusion and Application

The aqueous extract of the culinary ingredients can be added in water at 10mls to enable

nutrient utilization of feed and at 15ml to enhance quality carcass.

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