



EFFECT OF HERBAL MIXTURES ON GROWTH PERFORMANCE OF BROILER CHICKEN

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Abstract

Broiler chicken have been reported to have a short production cycle and high feed efficiency compared with other livestock because of the antibiotic growth promoters that were used to increase their production and health status. However, antibiotic residues and antimicrobial resistance has necessitated the used of herbs because they have appetizing, anti-inflammatory, and antibacterial properties. The research therefore evaluated the effect of herbal mixtures on performance of broiler chicken. One hundred and twenty chicks were used for the research. They were allotted to four treatments in a completely randomized design. Treatment (T) 1 received enrofloxacin, other received aqueous blend of; T2, 25 ml of garlic + 25 ml of ginger, T3 received 25 ml of garlic + 25 ml of scent leaf while T4 received 25 ml of ginger + 25 ml of scent leaf per liter of drinking water for four weeks. Data of water intake (WI) and feed intake (FI), weight gain (WG), final weight (FW) and feed conversion ratio (FCR) were recorded. The data were subjected to analysis of variance using SPSS. Significant differences ($p < 0.05$) were observed in the WI, FI, WG, FW and FCR. T4 had the least FI (2751 g), FCR (1.99) and the highest FW (1560 g), WG (1380 g). From this result, it was concluded that addition of 25 ml of ABGI and 25 ml of ABSL per liter of drinking water of broiler chicken enhances their weight gain and better feed conversion ratio. Therefore, inclusion of the herbs aqueous blends is recommended.

Keywords: Broilers, Herbal mixture, Growth performance, Weight gain

Introduction

Poultry industry has been the major source of meat and eggs which supplies efficient protein at low cost (Afolabi *et al.*, 2016). The meat type of poultry is bred for maximum meat production within short period with high feed efficiency (Ruben *et al.*, 2021). Poultry sector contributes 25% of the agricultural domestic products of the Nigerian economy (Rimi *et al.*, 2017). Broiler chicken has short production cycle, high feed efficiency compared with other livestock (Bonus *et al.*, 2012). Bessei (2006) reported that broilers are affected by poor welfare, especially nutrition and housing which may result to malformation of body structure and dysfunction, congestive heart conditions, skin and eye lesions (Oleforuh-Okoleh *et al.* 2015). To enhance the nutrition of broiler chicken, feed additives especially antibiotic growth promoters (AGP) were used to increase the production and improve health status (Udochukwu *et al.*, 2015). However, the unrestrained use of AGP has resulted to incidence of antibiotic residues in broiler chicken products and antimicrobial resistance. The exploration of phytogetic, prebiotics, probiotics, and organic acids as feed additives have taken place for decade. Herbs contain chemical compounds that prompt physiological responses in the system of animals (United States Department of Agriculture 2018). Phenolic compounds, alkaloids and saponins are among the important bioactive constituents of herbs. Beneficial herbs indigenous to Nigeria include ginger, bitter leaf, garlic, scent leaf which have been described to positively improve the growth of livestock (Muhammad *et al.*, 2009). Garlic (*Allium sativum*) possesses allicin, diallylsulfide, scent leaf has peptides, alkaloids, essential oils, phenols and flavonols while ginger contains gingerol and gingerdoine (Makanjuola *et al.*, 2014). These aforementioned compounds have appetizing, immunomodulatory, anti-inflammatory, anti-parasitic and antibacterial properties. This research therefore evaluates the effect of oral administration of three herbal mixtures on growth of broiler chicken.

Materials and methods

Experimental site

The research was carried out at the Teaching and Research Farm of the Federal Polytechnic, Ilaro. It is located at 72.42 meters above sea level. The yearly temperature is 30.85°C and 148.85 millimeters of precipitation.

Experimental Aqueous blends

Fresh Scent leaf was harvested from the Polytechnic Farm while Garlic and Ginger were purchased from popular market in Ilaro. The three herbs were rinsed to remove debris. They were weighed and blended with water at a ratio



of 1 to 10 (100 g to 1000 ml) separately. The mixtures were filtered to get aqueous blends of; scent leaf (ABSL), garlic (ABGA) and ginger (ABGI).

Experimental animal management

One hundred and twenty broiler chicks were gotten from a Hatchery in Ibadan. The birds were brooded according to standard poultry procedures and afterwards allotted randomly to four (4) treatments. Each treatments with 10 birds and three (3) replicates. Commercial broiler diets were used to feed the birds throughout the period of the experiment (four weeks).

Experimental layout

Birds were allotted to treatment using a completely randomised design. Treatment (T) 1 received enrofloxacin; T2 received 25 ml of ABGA + 25 ml of ABGI per liter of water; T3 received 25 ml of ABGA + 25 ml of ABSL per liter of water while T4 received 25 ml of ABGI + 25 ml of ABSL per liter of water.

Parameters measured

Records of water intake was calculated daily by subtracting the volume of water left-over from the volume of water given over a period of 24 hours. Feed intake was taken daily by subtracting the weight of feed left-over from the weight of feed given over a period of 24 hours. Body weight was determined at the commencement of the study (initial weight) and afterwards weekly (final weight). Subtraction of the initial weight from the final weight resulted to the weekly weight gain. Feed conversion was calculated by dividing the total feed consumed by total weight gained.

Statistical Analysis.

All data collected were subjected to one way analysis of variance (ANOVA) using SPSS software (IBM 26) and the treatment means were separated using Tukey's test. Statistical significance was assumed at $P < 0.05$.

Results

Table 1: Effect of three herbal mixtures on growth performance of broiler chicken

The effect of three herbal mixtures on growth performance of broiler chicken is shown in Table 1. There were significant differences ($p < 0.05$) in the value of parameters measured. T4 had the least feed intake (2751 g), feed conversion ratio (1.99) and the highest final weight (1560 g) as well as weight gain (1380 g) respectively.

Treatments	Water Intake	Feed Intake	Initial weight	Final weight	Weight gain	FCR
T1	9298.16 ^a	3651.13 ^a	180.00	1480.00 ^c	1300.00 ^c	2.46 ^a
T2	7966.06 ^c	2870.06 ^b	180.00	1530.00 ^b	1350.00 ^b	2.12 ^b
T3	7782.23 ^c	2875.13 ^b	190.00	1550.00 ^a	1360.00 ^b	2.11 ^b
T4	8537.23 ^b	2751.03 ^c	180.00	1560.00 ^a	1380.00 ^a	1.99 ^c
SEM	178.08	107.97	1.32	9.29	8.89	0.08
p-values	0.02	0.03	0.08	0.04	0.01	0.02

Discussion

From the result obtained from this research, the treatment administered oral herbal mixtures performed better than treatment one that was giving antibiotics growth promoter. This outcome corroborated the outcome reported by Anugom and Ofongo, (2019) that extract of herbs has growth promoting abilities and are capable of boosting the weight of broiler chicken when they are incorporated in their diet. Anugom and Ofongo (2019) observed a higher value in the final body weight, weight gain and feed conversion ratio of the birds administered herbs compared to the control treatment with no experimental aqueous herbal mixture. These outcomes could be attributed to the improved gut and health status of the birds which could be attributed to the oral administration of ginger, scent leaf and garlic aqueous blends. Reports by Afolabi *et al.* (2016) reveals that the phytochemical compounds in herbs promotes intestinal flora through enhanced feed efficiency resulting in improved growth.



Conclusion and recommendation

Administration of three aqueous blends in the broiler drinking water increase weight gain and feed conversion ratio especially 25 ml of ABGI and 25 ml of ABSL per liter of drinking water. It is therefore recommended that the administration of scent leaf, ginger and garlic aqueous blends should be administered as alternative to antibiotics in broiler chicken production.

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