



ORION
SCHOLAR JOURNALS



(RESEARCH ARTICLE)



Evaluation of growth performance of finisher broilers fed diets supplemented with garlic and ginger

BI Odo *

Department of Animal/Fisheries Science and Management, Faculty of Agriculture and Natural Resources Management, Enugu State university of Science Technology, Enugu, Nigeria.

International Journal of Multidisciplinary Research Updates, 2021, 01(02), 001-004

Publication history: Received on 14 July 2021; revised on 14 August 2021; accepted on 16 August 2021

Article DOI: <https://doi.org/10.53430/ijmru.2021.1.2.0036>

Abstract

The study was carried out to evaluate the effects of garlic and ginger (as feed additives) on growth performance of finisher boiler birds. A total of thirty two 4-week old birds used for the experiment were randomly assigned to four treatment groups in a complete randomized design (CRD). Each group was further subdivided into two replicates. Four experimental diets were formulated such that diet 1 (T₁) which served as control contained neither garlic nor ginger. Diets 2 (T₂) and 3 (T₃) contained 0.25% of garlic and 0.25% ginger respectively, while diet 4 (T₄) contained a mixture of both garlic and ginger at equal proportion (0.25% each). Parameters evaluated included weight gain, feed intake and feed conversion ratio (FCR). Results of the experiment which lasted for 35 days showed that birds fed supplemented diets had significantly higher (P<0.05) body weight and superior FCR than those fed unsupplemented diet. However, there was no significant difference (P>0.05) in feed consumption of the birds in the different treatments. The findings of the study suggest that garlic and ginger can serve as good feed additives in the diets of finisher boilers.

Keywords: Body weight gain; Daily feed intake; Feed conversion ratio; Broiler finishers; Natural feed additives

1. Introduction

Nigeria has a wide range of natural herbs scattered over a large area due to favorable climatic conditions. These herbs possess a number of chemical substances for use in poultry as feed additive [1]. Certainly, the intensive poultry management system in practice today may had led to marked increase in the production of poultry meat and eggs and subsequently triggered the development of new feed additives for poultry.

Feed additives are substances added in animal feed to improve their growth rate, feed conversion efficiency, livability, and lower morbidity and mortality. Herbs could be expected to serve as feed additives due to their suitability and preference, lower cost of production, reduced risk of toxicity, minimum health hazards and environmental friendliness [2]. Moreover, there is a great phobia in the use of antibiotics as feed additive because of public health concern about antibiotic residues in animal products and the possible emergence of antibiotic-resistant bacteria.

Present research work [3] on herbal formulations as feed additives have shown encouraging results as regards weights gain, feed efficiency, lowered mortality and increased livability in birds. Herb spices like garlic (*Allium sativum*) and ginger (*Zingiber officinale*) have been reported to possess useful pharmacological qualities due to potent chemical substances in them [1]. Freshly crushed garlic (*A. sativum*) contains allicin, allin, ajoene, diallylsulphide, dithimaroid, S-allylcysteine while ginger possesses zingerone, shogaols and gingerole.

*Corresponding author: BI Odo

Department of Animal/Fisheries Science and Management, Faculty of Agriculture and Natural Resources Management, Enugu State university of Science Technology, Enugu, Nigeria.

Garlic and ginger as natural feed additives in poultry nutrition may be of great importance and value especially for finisher broilers. This is due to their anti-bacterial, anti-inflammatory, antiseptic, anti-parasitic and immunomodulatory properties. Fresh and dry garlic and ginger are available in local Nigeria markets. Even though these herbs (garlic and ginger) have been known to contain chemical substances that may enhance poultry production, their choice and proportion as feed additives in finisher broiler diet has not been well ascertained. This therefore justifies this research work.

2. Material and methods

2.1. Experimental Site

The experiment was conducted at the Teaching and Research farm of Enugu State University of Science and Technology, Agbani- Enugu, Nigeria.

The area lies within Latitude 07° 41 North and 08° 71 South and Longitude 06°81 East and 07° 61 West. Its annual rainfall and temperature ranges from 1680mm to 1800mm and 30°C during the hottest period of the year, February – April) to 22°C during the coldest period (December–January) respectively. The vegetation cover of Enugu consist of trees, shrubs, grasses and legumes.

2.2. Management of experimental birds

Thirty two (32) 4–week old broilers were used for the study. They were raised in deep litter house made of concrete floor that was covered with wood shavings as litter material. The birds were randomly allotted to four dietary treatments in a complete randomized design (CRD). Each treatment consisting of eight birds was further replicated twice with four birds per replicate.

Feed and water were offered for *ad libitum* consumption throughout the period of the experiment. Polyvitamins (Vitalyte) was also offered through water to help boost appetite. The birds were appropriately and timely vaccinated against known endemic diseases of the area (especially New castle disease and Infectious bursal disease).

The pens were cleaned and replaced with new wood shavings on weekly basis. They were also kept dry to break the transmission cycle of some common diseases of poultry e.g. coccidiosis.

2.3. Experimental Diets

Four (4) experimental diets were formulated to include diet 1 (control) containing neither garlic nor ginger. Diet 2 and 3 contained 0.25% of garlic and ginger respectively while diet 4 contained a combination of 0.25% each of garlic and ginger. The composition of experimental diets is as shown in Table 1 below.

2.4. Data collection and statistical analysis

Data on feed intake and body weight were collected and used to compute the following:

- Average weight gain of birds(g)
- Average daily feed intake(g)
- Feed conversion ratio.

Data collected were subjected to analysis of variance and in case of parameters showing significant treatment effect, mean values were further compared by Duncan's multiple range test [4].

Table 1 Composition of Experimental Diets

Ingredients	Treatments			
	T ₁	T ₂	T ₃	T ₄
Maize	50.00	50.00	50.00	50.00
Wheat	14.00	14.00	14.00	14.00
Soya bean meal	20.00	20.00	20.00	20.00
Palm kernel cake	9.50	9.50	9.50	9.50
Bone meal	3.00	3.00	3.00	3.00
Fish meal	3.00	3.00	3.00	3.00
Lysine	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25
Garlic	0.00	0.00	0.25	0.25
Ginger	0.00	0.25	0.00	0.25
TOTAL	100	100	100	100
Calculated chemical composition				
Crude protein	19.36	19.36	19.37	19.38
ME (Kcal/Kg)	3002.8	3002.8	3002.8	3002.8

3. Results and discussion

The effects of garlic and ginger supplementation on the performance of finisher broilers are as shown in Table 2. There was significant difference ($P < 0.05$) in weight gain of birds among the treatments. Birds fed garlic and ginger supplemented diets recorded higher body weight gain than the control group. The improved weight gain in the garlic and ginger supplemented diets is in line with previous report by [5] that rats fed a mixture of ginger and garlic show an increase in body weight. Similarly, [6] reported a numerical increase in final body weight and weight gain of broilers fed a mixture of garlic and ginger. The improvement in weight achieved by ginger and garlic supplementation over the control indicates that they are good additives in broiler diet. However, this observation contradicts the finding of [7] who reported that inclusion of ginger and garlic did not improve the weight gain of broilers.

There was no significant difference ($P > 0.05$) in feed intake of birds among the treatments. However, the inclusion of garlic and ginger as a sole agent only numerically reduced the feed intake of birds fed the diet. This is not surprising as allicin, an odoriferous compound [8] can negatively affect feed intake of birds. It therefore suggest that the organoleptic properties of garlic are responsible for the decreased feed intake. Sense of smell is heavily implicated in feed intake of birds as in other monogastrics [9].

There were significant difference ($P < 0.05$) in feed conversion ratio of the birds in the different treatments. Birds fed supplementary diets recorded superior ($p < 0.05$) FCR than the control. The better feed efficiency observed in birds fed garlic and ginger supplemented diets suggests that the anti-microbial action of garlic and ginger may be sufficient to inhibit microbial fermentation [10]. This implies that the addition of these supplements may have brought a sparing effect – thus improving FCR.

Table 2 Growth Performance of Finisher Broilers fed garlic and ginger

Parameters	Treatments			
	T ₁	T ₂	T ₃	T ₄
mean daily feed intake (g)	135.9	113.1	114.8	115.9
mean daily weight gain (g)	29.3 ^a	32.2 ^b	32.4 ^b	33.25 ^b
Feed conversion ratio	0.448 ^a	0.403 ^b	0.403 ^b	0.404 ^b

a,b: means on the same row with different superscripts are significantly different (P<0.05)

4. Conclusion

It can be concluded that 0.25% levels supplementation of ginger and/or garlic in finisher diets should be encouraged since it promotes growth performance.

Compliance with ethical standards

Acknowledgments

The author gratefully acknowledges Mr. Anselm Valentine Akachukwunonso and Miss. Eunice Chijioke for the data collection and typesetting of the manuscript respectively.

References

- [1] Akhtar MS, Afzal H, Chandry F. Preliminary in vitro antibacterial screening of Bakin and Zarisk against seloneurMedicose. 1984; 9: 6-7.
- [2] Devegowda G. Herbal medicine and untapped treasure in poultry production. In: proc. 20th World poultry congress. New Delhi, India. 1996.
- [3] Kumar R. Anti-nutrition factors, the potential risk of toxicity and methods to alleviate them. Eds: Andrew Speedy and Piere-Luc. In Legume trees and other fodder trees as protein sources for livestock. FAO Animal production paper. 1991.
- [4] Snedecor GW, Cochran WG. Statistical methods (8th Edition), IOWA State University Press Ames. 1991.
- [5] Ahmed RS, Sharma SB. Biochemical studies on combined effect of garlic. (*Allium sativum*) and ginger (*Zingiber Officiale*) in albino rat. Indian J. of Experimental Biology. 1997; 35(8): 849-843.
- [6] Ademola SG, Farinu GO, Babatunde. Serum lipid, growth and haematological parameters of broilers fed garlic, ginger and their mixture. World journal of Agric. Science. 2009; 5(1): 99-104.
- [7] Horton GM, Blethen DB, Prasad BM. The effect of garlic (*Allium sativum*) on feed palatability of horses and feed consumption, selected performance and blood parameters in sheep and swine. Canada Journal of Animal Science. 1991; 71: 607-610.
- [8] Cavallito CJM, Babley JA. Allicin, the antimicrobial action. Journal of American chem. Society. 1994; 66: 1550-1951.
- [9] Mellor S. Herbs and spices promote health and growth. Pig progress. 2000; 16: 27-30.
- [10] Ankris S, Mirelman D. Antimicrobial properties of allicin from garlic Microbes and infection. 1999; 2: 125-131.