



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2019; 7(6): 2578-2580

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Received: 04-09-2019

Accepted: 06-10-2019

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International Journal of Chemical Studies

Effect of dietary supplementation of turmeric and ginger powder as feed additives on growth performance of broilers

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Abstract

Objective of this study was to determine the optimum level of incorporation of Turmeric (*Curcuma longa*) and Ginger (*Zingiber officinale*) alone and in combination in the ration as feed additive on growth performance of broilers. A feeding trial of 42 days was conducted, using 180, one-day-old broiler chicks (VENCobb) randomly distributed in CRD. The four treatments were designated as T₁, i.e., control fed on basal diet, T₂, i.e., supplemented with @ 0.5% turmeric powder T₃, i.e., supplemented with @ 0.5% ginger powder and T₄ supplemented with @ 0.75% turmeric + 0.75% ginger powder. All the treatment groups were further divided in three replicates viz., R₁, R₂ and R₃. The results revealed that final body weight gain was highly significantly ($p < 0.01$) in T₂ as compared to other treatment groups. While, there was no significant effect of dietary treatment on feed intake and FCR. It was concluded that Turmeric improves the growth performance of broilers when added @ 1.5% level as feed additives in broiler ration.

Keywords: Turmeric, ginger, growth, broilers, FCR

Introduction

Feed additives are a group of nutrient and non-nutrient compounds which helps in improving the efficiency of feed utilization and thus reducing the high cost of feed. It is in this context the poultry producer began to make use of growth promoters like antibiotics to enhance the growth of broilers for higher profit. Unfortunately, in recent years there has been a growing concern about the use of antibiotics and hormones as growth promoters, especially in broiler production because of this residual ill effects like the possible development of both drug resistance, cross-resistance, multiple resistance (Mehala and Moorthy 2008) [9] and (Hakim *et al.* 2009) [6]. The *Curcuma longa* exhibiting anti-inflammatory, antioxidant, antibacterial, antiprotozoal, antiviral, anticarcinogenic, antihypertensive and hypo cholesteric and antifungal activities. It is used in gastrointestinal and respiratory disorders (Anwarul *et al.* 2006) [2]. Ginger as a natural feed additive immense benefit and value in poultry nutrition, especially for broilers due to their antibacterial, anti-inflammatory, antiseptic, anti-parasitic and immune modulatory properties (Onu 2010) [12].

Considering the above facts in view, the present study was proposed with an aim to formulate a better herbal feed additive with turmeric and ginger supplementation in feed for broilers.

Materials and methods

The study was conducted on one hundred eighty (180) unsexed, one-day-old 'VENCobb' broiler chicks, initial body weight ranged between 55.96 to 57.42 g were randomly distributed into four treatments T₁ - basal diet, T₂ - supplemented with @ 0.5% turmeric powder T₃ - supplemented with @ 0.5% ginger powder and T₄ - supplemented with @ 0.75% turmeric + 0.75% ginger powder. All the treatment groups were further divided in three replicates viz., R₁, R₂ and R₃ and commercially available ready-made broiler starter & finisher feed will be procured. Feed intake, Body weight gain, and FCR of chicks, was recorded at weekly intervals. The experiment lasted for 6 week and samples of feed, left over by an individual bird at the end of the metabolic trial were stored and subjected to proximate analysis.

Results and discussion

Table 1: Average weekly feed intake (g/bird/week)

Parameters	T ₁	T ₂	T ₃	T ₄	F- Value	Level of Sig.
Starter phase	2018.32 ± 43.24	2021.34 ± 9.47	1962.89 ± 103.46	1979.31 ± 46.58	0.22	NS
Finisher phase	2498.90 ^{ab} ± 35.64	2501.74 ^{ab} ± 8.74	2591.93 ^a ± 44.13	2433.51 ^b ± 13.34	4.87	*
Overall period	4517.22 ± 47.16	4523.09 ± 10.11	4554.81 ± 32.56	4412.82 ± 35.09	3.29	NS

* Means ($P < 0.01$)

NS Means Non Significance

a, b, c Means with different superscripts in a row differ significantly

Average weekly feed intake

Statistical analysis of data (Table 1) revealed that no significant difference at the end of starter phase and overall period of experiment during finisher phase (5-6 weeks) feed intake was significantly ($p < 0.05$) lowest in T₄ group, highest in T₃ group and the value of T₂ group was comparable with T₁ group. It was consistent with Mondal *et al.* (2015) [10] and Rajput *et al.* (2012) [14] reported that feed intake was almost difference was non-significant. Barazesh *et al.* (2013) [3] also

observed no significant effect on broiler supplemented with 1.50% ginger powder as compared to control group. On the contrary, Rafiee *et al.* (2013) [13] and Reddy *et al.* (2012) [15] reported that the feed intake was higher significant between different treatment. A significant decrease in feed intake for group supplemented with 1.50% of ginger powder was observed by AL-Jaleel *et al.* (2012) [1] when compared to control.

Table 2: Average Weekly Body weight gain (g/bird)

Parameters	T ₁	T ₂	T ₃	T ₄	F- Value	Level of Sig.
Starter phase	1394.59 ^{ab} ± 2.79	1409.40 ^a ± 2.31	1366.53 ^b ± 19.18	1368.50 ^b ± 6.54	4.09	*
Finisher phase	1261.08 ^b ± 8.17	1386.69 ^a ± 3.88	1313.00 ^a ± 13.91	1258.5 ^b ± 28.90	10.39	**
Overall period	2655.67 ^b ± 9.58	2796.09 ^a ± 4.88	2679.53 ^b ± 32.68	2627.03 ^b ± 32.36	9.86	**

* Means ($P < 0.01$)

** Means ($P < 0.05$)

a, b, c Means with different superscripts in a row differ significantly

Average weekly body weight gain

Statistical analysis of data (Table 2) revealed that body weight gain during starter phase was significantly ($p < 0.05$) highest in T₂ group and lowest body weight gain in T₃ group. However, during finisher phase and overall period body weight gain was highly significant ($p < 0.01$) in T₂ group and lowest body weight gain in T₄ group. It was consistent with the findings of Kafi *et al.* (2017) [7] and Sethy *et al.* (2016) [16] observed that significant increase body weight gain in broiler fed supplemented with turmeric powder as compared to control

group. Similarly, Ebrahimnezhad *et al.* (2014) [4] observed that significantly increase body weight gain in broiler fed the diet supplemented with different levels of ginger powder as compared to control group. However, these study was differs from the findings of Naderi *et al.* (2014) [11] reported that no significant effect on body weight gain, which broiler groups fed supplemented the diet with turmeric powder as compared to control group. Zomrawi *et al.* (2012) [20] also observed no significant differences between @ 1.50% ginger powder and control group.

Table 3: Average Feed Conversion Ratio (FCR)

Parameters	T ₁	T ₂	T ₃	T ₄	F- Value	Level of Sig.
Starter phase	1.27 ± 0.10	1.33 ± 0.01	1.34 ± 0.03	1.36 ± 0.01	0.47	NS
Finisher phase	1.96 ± 0.06	1.80 ± 0.01	1.85 ± 0.14	1.92 ± 0.05	1.66	NS
Overall period	1.50 ± 0.08	1.49 ± 0.01	1.51 ± 0.06	1.55 ± 0.02	0.95	NS

NS means Non Significance

Statistical analysis of data (Table 3) revealed that no significant difference between treatment groups during starter phase, finisher phase and overall period of experiment. Which was similar to the findings of Youssef *et al.* (2016) [19] and Kehinde *et al.* (2011) [8] reported that no significant difference of ginger supplemented groups in FCR as compared to control group. Similarly Reddy *et al.* (2012) [15]; Emadi and Kermanshahi (2006) [5] observed that no significant difference of turmeric supplemented groups in FCR as compared to control group. On the contrary Shinde *et al.* (2017) [17] reported that significant improvement of FCR in broiler fed different levels of ginger powder as compared to control group. Similarly, Kafi *et al.* (2017) [7] and Wang *et al.* (2017) [18] observed that significant improvement of FCR in broiler fed different levels of turmeric powder as compared to control group.

Conclusion

It was concluded that inclusion of turmeric powder supplementation was superior in comparison ginger and mixture of turmeric and ginger powder supplementation. Turmeric improves the growth performance of broilers when added @ 1.5% level as feed additives in broiler ration.

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