



SHORT COMMUNICATION

Influence of Supplementing Giloe and Cinnamon on Production Performance in Commercial Broiler Chicken

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ABSTRACT

Feeding trial of 42 days was conducted to study the effect of dietary incorporation of giloe and cinnamon powder on growth performance in broiler chicken. A total of 120, day-old broiler chicks were divided randomly into 6 groups with 2 replicates of 10 chicks each viz., T₁ (control) were fed basal diet whereas in treatment group T₂, T₃, T₄, T₅ and T₆, basal diet was incorporated with 1% giloe, 2% giloe, 1% cinnamon, 2% cinnamon and combination of 1% giloe and 1% cinnamon, respectively. During the whole experimental period (42 d), incorporation of 1% giloe improved broiler performance in terms of body weight, weight gain, feed conversion ratio and performance index. Hence, increased body weight gain, better feed conversion ratio and performance index was attained by inclusion of giloe @ 1% in diet of broiler chicken.

Key words: Broiler chicken, Cinnamon, Giloe, Growth performance

Cinnamon (*Cinnamomum zeylanicum*) belongs to the *Lauraceae* family. Cinnamon primarily contains essential oils and other derivatives such as cinnamaldehyde, cinnamic acid and cinnamate. Cinnamon has activities against neurological disorders such as Parkinson's and Alzheimer's diseases (Sangal, 2011). Cinnamon helps in reducing colon cancer (Long *et al.*, 2015). *Giloe* (*Tinospora cordifolia*), a deciduous climbing shrub, protects the body against diseases. Giloe leaves, barks and roots contain various bioactive compounds. It has anti-spasmodic, anti-inflammatory, anti-arthritic and anti-allergic properties (Chopra *et al.*, 1982). The aqueous extract of giloe plant possessed hepato-protective effect (Ganguly and Prasad, 2011). Herbal extracts in diet of broilers enhanced their performance (Koochaksaraie *et al.*, 2011; Petrolli *et al.*, 2012; Faghani *et al.*, 2014; Shirzadegan, 2014; Hussein *et al.*, 2016). Realizing their beneficial effects both giloe and cinnamon either singly or in combinations were used in diets of broiler chicken to study their growth performance.

For the experimental feeding trial, 120, day-old broiler chicks (Vencobb) weighing 35- 45 g were purchased from the adjoining local market, Bajpur. All

the chicks were individually weighed and wing banded. Then chicks were randomly allotted to six different groups each with two replicates of 10 chicks in such a way that average body weight was similar for all the groups. Feeding trial was carried out in completely randomised design. Feed used for experimental broiler chicks were as per BIS specification (1997). Giloe stem and cinnamon bark were collected from Medicinal Plant Research Development Centre (MRDC) of G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand. The stems and bark were dried, ground and stored in moisture free bags until used. The proximate composition of different diets was analysed (AOAC, 2005). Group T₁ was taken as control while in groups T₂ and T₃, giloe was added @ 1 and 2% to the basal diet, respectively. Cinnamon was supplemented @ 1 and 2%, respectively in groups T₄ and T₅ while in group T₆, a combination of giloe @ 1%+cinnamon @ 1% was added to the basal diet. The broiler chicks were housed in deep litter system and provided *ad lib.* feed and water throughout the trial period. Adequate light, temperature and ventilation were provided during the experiment. A layer of 4-5 cm thick rice husk was provided as litter material. All the housing and

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managerial conditions were similar in all the groups. The starter diet was provided during 0-3 weeks while, finisher diet was provided during 4-6 weeks of age in clean feeder. Fresh and clean water was made available to all the birds during the study. The body weight of individual birds and residual feed was recorded weekly replicatewise. The birds were vaccinated for IBD on 14th d and RD vaccine (Lasota strain) booster on 28th d. Growth performance was studied by recording and calculating feed intake and body weight gain. Feed conversion ratio (FCR) was calculated by dividing feed consumed by weight gain for a particular period. The performance index (PI) of broilers during different periods of growth was calculated by using the formula (Bird, 1995) *i.e.* body weight gain (g) divided by FCR. The data were analysed statistically (Snedecor and Cochran, 1994) by using software SPSS 16 with the one way Analysis of Variance (ANOVA) technique.

The chemical composition of broiler starter and finisher diets has been presented in Table 2. The average body weight gain was higher ($P<0.05$) in chicken fed diets incorporated with giloe and cinnamon powder. There was improvement in body weight gain

due to incorporation of giloe and cinnamon powder, however, the body weight gains were similar in groups T_2 , T_3 , T_4 and T_6 were statistically similar. The average weight gain in group T_1 differed ($P<0.05$) from groups T_2 , T_3 , T_4 and T_6 . The highest weight gain was observed in group T_2 (1% giloe). The cumulative feed intake was also similar in different groups. The FCR varied from 1.76 in group T_2 (1% giloe) to 1.95 in group T_1 (control). The better FCR was observed in group T_2 followed by groups T_6 and T_3 . The performance index during 0-42 days of feeding trial was higher ($P<0.01$) in group T_2 followed by groups T_6 and T_3 . The overall cumulative performance in terms of weight gain, FCR and performance index improved due to incorporation of giloe and cinnamon powder in the broiler chicks compared to control. Significant improvement in body weight on supplementation of giloe alone has also been reported by Gujral *et al.* (2002) and Kumar *et al.* (2006). The use of giloe alone as well as in combination with bael showed significant effect on body weight gain. The results of the present study are corroborated by findings of other workers (Kulkarni *et al.*, 2011; Bhardwaj *et al.*, 2011; Rajeshwari *et al.*, 2012;

Table 1. Ingredient composition (%) of basal diets

Ingredient	Starter diet (0-3 wk)	Finisher diet (4-6 wk)
Maize	55.00	60.00
Deoiled soyabean meal	36.00	32.00
Rice polish	4.60	3.10
Soyabean oil	0.50	1.00
Marble stone	1.00	1.00
Dicalcium phosphate	2.00	2.00
DL- methionine	0.10	0.10
Coccidiostat (Meduramycin)	0.05	0.05
Copper sulphate	0.01	0.01
Common salt	0.30	0.30
Merivite -100 (Vitamin B ₁₂)	0.02	0.02
Phosphoric acid	0.10	0.10
Lipocare (choline chloride)	0.05	0.05
Hepatocare	0.10	0.10
Vitamin mixture	0.03	0.03
Trace minerals	0.14	0.14

Table 2. Chemical composition (% DM basis) of the experimental diets

Parameter	Group					
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆
Starter diets (0-3 wk)						
Dry matter	93.97	94.22	94.18	94.06	94.48	94.1
Crude protein	22.89	22.92	22.96	22.90	22.92	22.90
Ether extract	3.85	3.75	3.77	3.80	3.81	3.79
Crude fibre	4.11	4.78	4.81	4.25	4.29	4.60
Ash	10.24	6.92	6.97	6.87	6.90	6.90
Nitrogen-free extract	58.91	61.63	61.49	62.18	62.08	61.81
Finisher diets (4-6 wk)						
Dry matter	94.06	94.62	94.92	94.31	94.27	95.06
Crude protein	19.23	20.70	20.75	20.52	20.58	20.64
Ether extract	3.60	3.42	3.47	3.54	3.58	3.51
Crude fibre	4.17	4.97	5.02	4.72	4.78	4.92
Ash	9.46	7.81	7.86	16.97	6.99	7.10
Nitrogen-free extract	63.54	63.1	62.9	64.25	64.07	63.83

Bhardwaj *et al.*, 2012). Sarag *et al.* (2001) and Gujral *et al.* (2002) also recorded increase in feed intake due to inclusion of giloe in the diet of broiler chicks. The inclusion of giloe improved FCR (Sarag *et al.*, 2001). Improvement in body weight gain and feed conversion ratio in supplemented groups might be due to active

ingredients in giloe and cinnamon causing greater feed utilization efficiency.

The growth performance of broiler chicks fed diets containing cinnamon powder increased when compared to that of control chicks which could be related to the fact that aromatic herbs have some growth

Table 3. Growth performance of broiler chicken from 0-42 d fed diets incorporated with giloe and cinnamon powder

Parameter	Group						SEM	P value
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆		
Initial body weight (g)	44.40	44.00	41.95	44.10	44.60	43.20	0.38	0.40
	±1.20	±1.20	±0.55	±1.10	±0.60	±0.20		
Body weight at d 42* (g)	1453 ^b	1624 ^a	1582 ^a	1561 ^a	1519 ^{ab}	1594 ^a	19.04	0.05
	±65.8	±3.85	±1.46	±17.95	^b ±20.06	±8.75		
Weight gain (g)	1408 ^b	1580 ^a	1540 ^a	1517 ^a	1474 ^{ab}	1551 ^a	19.19	0.05
	±67.05	±2.65	±0.91	±16.85	±19.46	±8.55		
Cumulative feed intake* (g)	2747	2774	2830	2832	2784	2817	22.68	0.93
	±143.93	±57.47	±30.74	±27.20	±44.83	±36.37		
Feed conversion ratio**	1.95 ^a	1.76 ^d	1.84 ^{bc}	1.87 ^{bc}	1.89 ^b	1.82 ^{cd}	0.02	0.01
	±0.01	±0.04	^c ±0.00	±0.00	±0.01	±0.01		
Performance index**	722.23 ^d	900.52 ^a	838.10 ^{bc}	812.87 ^{bc}	780.73 ^c	853.95 ^{ab}		
	±30.92	±21.67	±0.12	±10.25	±8.04	±1.61		

^{a,b,c,d}Values bearing different superscripts in a row differ significantly (*P<0.05; **P<0.01)

promoting, appetite, digestion and antimicrobial effects (Kamel, 2001) and anti- heat stress properties for growing birds and may have stimulating effects on the animal digestive system (Langhout, 2000). Sang-Oh *et al.* (2013) also observed an increase in body weight, weight gain and better FCR in cinnamon fed broiler chicks which might be due to improved health and immune status of birds associated with increased serum levels of immunoglobulins. Dietary cinnamon powder has also been reported to have antibacterial (Valero and Salmeron, 2003; Hernandez *et al.*, 2004) and antioxidant properties (Park and Park, 2000).

Hence, increased body weight gain, better feed conversion ratio and performance index was attained by inclusion of giloe @ 1% in diet of broilers.

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