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Research Article

EFFECT OF GARLIC (ALLIUM SATIVUM) SUPPLEMENTATION ON PRODUCTIONAL TRAITS IN CHICKEN (GALLUS DOMESTICUS)

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ABSTRACT

Garlic is well known since ages for medicinal properties. However, there are few reports regarding its effect on poultry production. The present investigation describes the effect of garlic supplementation in feed on productional traits in broiler chicken. The 45 day old broiler chicks were divided randomly into 3 groups, each consisting 15 birds. Group I birds served as control and were fed on conventional diet. Group II and III birds were supplemented with garlic at the rate of 1.5% and 3.0% respectively for a period of 8 weeks. Productional traits like feed consumption, body weight gain and feed conversion efficiency/ratio were recorded. There was no significant difference in feed intake in garlic supplemented groups as compared to control. However, the body weight gain in garlic supplemented groups was slightly higher than control group, and better feed conversion efficiency/ratio in garlic treated groups was observed as compared to untreated group. The supplementation of garlic has slightly better effect on growth and feed conversion efficiency in broiler chicken.

Key words: Broiler, chicken, garlic, production

Poultry is one of the fastest growing segments of the agricultural sector in India. In the recent past the eggs and broiler's production has been increasing at a rate of 8.0 to 10.0 per cent per annum (Mehta *et al.*, 2003). Broiler industry provides rural employment and fulfils all nutritional standards. The chicks and eggs are inexpensive sources of protein among all animal products. The broiler type chicken produces 450 g of protein as compared to 160 gm, 96 g and 225 g of protein given by swine, beef type cow and sheep or goat respectively from 10 kg similar feed (Qureshi *et al.*, 1983).

Garlic (*Allium sativum*) has not only a wide range of antimicrobial activity, but also causes beneficial effects on cardiovascular and immune systems (Harris *et al.*, 2001). More than 70 per cent of expenses in broiler management are in the form of feed management. So, the cost of feed in broiler management can be reduced by using less expensive feed or feed supplements like garlic (Ademola, 2004). This communication describes the effect of garlic supplementation on productional traits in broiler chicken.

MATERIALS AND METHODS

The 45 day old unsexed and healthy commercial broiler chicks were procured from a commercial breeding farm, Hisar belonging to the same batch and breeding stock. The chicks were reared under strict hygienic conditions. Before housing the chicks, rooms, brooder battery and cages were thoroughly cleaned with 2.5 per cent phenol and subsequently fumigated with formaldehyde gas. Electric bulbs were used as source of heat and light. The experimental chicks were reared on the feed procured from Department of Animal Nutrition of the University. Garlic was purchased from the Department of Vegetable Crops, and was crushed, shade dried and ground with mixer grinder to powdered form and was supplemented in the feed.

Chicks were kept for one week on chick mash. On the first day, chicks were divided into three groups i.e. Group I, II and III, each having 15 birds. On the

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third day all the birds were vaccinated intranasally against Newcastle Disease (ND) by F_1 strain vaccine procured from Indovax Pvt. Ltd., Hisar. Birds of Group I kept as control and maintained on conventional poultry feed procured from Department of Animal Nutrition of the university. Birds of Group II were maintained upto 8 weeks of age on same feed supplemented with garlic at the rate of 1.5% on dry matter basis of total feed. Birds of Group III were also maintained on same feed supplemented with garlic at the rate of 3%. A weekly record of feed intake was maintained for each experimental group. Chicks were weighed individually at the start of experiment and latter on weekly to calculate gain in body weight. Feed conversion ratio (FCR) as a measure of efficiency of utilization of feed of each individual bird from each respective group was calculated by following formula:

$$FCR = \frac{\text{Total feed amount consumed (g) in a period}}{\text{Body weight gain (g) in a period}}$$

The data was statistically analyzed the using ANOVA followed by t-test for comparison using Sigma stat software.

RESULTS AND DISCUSSION

A gradual increase in body weight with the progression of age was observed in all the groups. The average weight on 0 day in group I, II and III chicks was 41.82 g, 43.08 g, 40.42 g respectively (Table 1). The average weight on 8th week in group I chicks was 1613.61 g, while in group II and III it was 1653.89 g and 1730.00 g respectively. There was no significant ($P<0.05$) difference in body weight gain between control and garlic treated groups at any given interval of time. However, there was uniformly slight more gain in body weight in group III except 1st week post-treatment as compared to groups[2] and II. These observations are in confirmation with Ademola (2004) who reported that birds on garlic (5g/kg, 10g/kg and 15g/kg) treatments in feed had slightly better average weight gain and final live weight than those of control birds.

The average feed consumption in 1st week in group I chicks was 75.30 g. While it was 75.64 g in group II and 73.37 g in group III. The average feed consumption in 8th week in group I chicks was 1304.56 g. While in group II and in group III it was 1357.14 g and 1340.91 g respectively (Table 2). It indicated a gradual increase in feed consumption with the progression of age in all the groups. The feed conversion efficiency/ratio on 1st week in group I chicks was 2.00. While it was 1.97 in group II and 1.96 in group III. The average feed conversion efficiency/ratio on 8th week of age in group I chicks was 3.82. While in group II and III it was recorded 3.75 and 4.60 respectively. However, there was slight better feed conversion efficiency in group II and III as compared to group I except 7th week of post treatment in group II and 8th week of post treatment in group III.

Table 1

Mean body weight, average body weight (Mean±S.E.) and per cent body weight gain in broiler chickens maintained on garlic supplemented feed

Weeks post-treatment	Mean body weight gain (grams)			Average body weight (grams)			Per cent body weight gain		
	Group I	Group II	Group III	Group I	Group II	Group III	Group I	Group II	Group III
0 Day	-	-	-	$41.82^{a} \pm 0.69$	$43.08^{a} \pm 0.79$	$40.42^{a} \pm 0.90$	-	-	-
1st	$37.62^{a}\pm3.11$	$38.26^{a}\pm3.56$	$37.28^{a}\pm3.88$	$76.40^{a} \pm 2.18$	$75.92^{a} \pm 2.90$	$79.64^{a} \pm 3.45$	89.9%	88.8%	93.0%
2nd	$65.78^{a}\pm4.68$	$79.73^{a}\pm5.88$	$81.78^{a}\pm5.09$	$142.11^{a} \pm 4.93$	$156.43^{a} \pm 8.80$	$161.48^{a} \pm 7.83$	86.0%	101.0%	102.0%
3rd	$120.75^{a}\pm7.00$	$139.21^{ab}\pm7.68$	$155.74^{b}\pm8.61$	$260.73^{a}\pm12.30$	$292.13^{ab}\pm13.59$	$317.17^{b}\pm11.45$	84.9%	88.9%	96.4%
4th	$203.06^{a}\pm11.11$	$216.92^{a}\pm8.46$	$226.65^{a}\pm8.37$	$470.70^{a}\pm16.26$	$512.35^{ab}\pm17.80$	$558.32^{b}\pm12.04$	77.8%	74.2%	71.4%
5th	$245.32^{a}\pm13.56$	$249.28^{a}\pm12.37$	$248.31^{a}\pm10.85$	$680.74^{a}\pm23.60$	$761.58^{b}\pm19.73$	$798.31^{b}\pm25.13$	52.1%	48.6%	44.4%
6th	$280.76^{a}\pm13.51$	$304.19^{a}\pm17.89$	$379.01^{b}\pm15.98$	$983.39^{a}\pm29.72$	$988.43^{a}\pm28.78$	$1082.76^{b}\pm27.27$	41.2%	39.9%	47.4%
7th	$246.15^{a}\pm11.18$	$285.00^{b}\pm14.16$	$291.66^{b}\pm15.31$	$1258.38^{a}\pm23.70$	$1292.33^{a}\pm28.21$	$1320.62^{b}\pm22.42$	25.0%	28.8%	26.9%
8th	$290.99^{a}\pm17.75$	$340.94^{ab}\pm15.40$	$361.56^{b}\pm11.77$	$1613.61^{a}\pm30.96$	$1653.89^{ab}\pm19.98$	$1730.00^{b}\pm20.30$	23.1%	26.3%	27.3%

Values bearing different superscripts within a row (a, b) differ significantly at 5% level of significance

Table 2

Average feed consumption and feed conversion efficiency/ratio in broiler chickens following garlic powder supplementation in feed

Weeks post-treatment	Average feed consumption (grams)			FCR		
	Group I	Group II	Group III	Group I	Group II	Group III
1st	75.30	75.64	73.37	2.00	1.97	1.96
2nd	164.28	185.75	200.66	2.50	2.32	2.45
3rd	321.42	285.98	310.03	2.66	2.06	1.99
4th	661.53	621.47	615.22	3.25	2.87	2.72
5th	857.14	803.42	798.07	3.60	3.22	3.21
6th	991.60	839.91	962.55	3.26	2.95	2.53
7th	1187.24	1071.39	1090.90	4.07	4.35	3.82
8th	1304.56	1357.14	1340.91	3.82	3.75	4.60

In the present study, there was less feed consumption in group II and III as compared to group I at any given time interval. However, the feed conversion efficiency/ratio in garlic supplemented groups II and III was slightly better as compared to group I except 7th week of age in group II and 8th week of age in group III where the feed conversion efficiency/ratio was slightly higher compared to group I. These observations are in confirmation with those of Ademola (2004) who reported that birds on garlic treatment had slightly better average feed intake and feed conversion efficiency/ratio as compared to control birds. Similarly, Javandel *et al.* (2008) reported insignificant effect of garlic supplementation on feed intake, weight gain and feed conversion efficiency in broiler chicken. The present study suggests that supplementation of garlic has slightly better effect on feed consumption and feed conversion efficiency.

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