Haryana Vet. **52** (December, 2013) pp 66-68

Research Article

EFFECT OF INDIAN GOOSEBERRY AND MULTI-ENZYME SUPPLEMENTATION ON THE PERFORMANCE OF BROILERS DURING HOT WEATHER

M. KUMAR[1], R. K. SHARMA[1]*, M. CHAUDHARI[2] and A. JAKHAR[1]
Department of Livestock Production Management, [2]Department of Animal Genetics and Breeding,
College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar-125 004

Received: 12.03.2013; Accepted: 07.08.2013

ABSTRACT

An experiment was conducted to investigate the effect of supplementing diets with Indian gooseberry in combination with multi-enzyme on production performance of broiler chicks. Day-old vaccinated commercial broiler chicks (n=240) were procured from a private hatchery. The chicks were distributed into four treatments having four replicates of fifteen chicks in each replicate. The supplemental treatment groups were control (C), T1 (1.0% Indian gooseberry), T2 (0.05% multi-enzyme) and T3 (1%Indian gooseberry+0.05% multi-enzyme), in the basal diet of broilers reared in hot humid weather up to 6 weeks age. The body weight, weight gain, feed intake and feed efficiency were studied. Supplementation of Indian gooseberry, multi-enzyme and their combination in broiler diet did not affect the body weight and weight gain of broiler at six weeks of age. Feed efficiency and performance index of broiler fed supplemented diet varied significantly. The feed consumption of T1 and T3 was significantly ($P<0.05$) lower than the control. The feed conversion ratio in T1 and T3 was also better than control group. From the present study, it can be concluded that anti-stress effect of Indian gooseberry and multi-enzyme supplementation increased heat tolerance capacity of the bird and increased livability of the birds without compensating the performance.

Key words: Broiler, Indian gooseberry, multi-enzyme

Poultry sector in India is growing at the rate of 15.58% per year with an annual production of more than 65.4 billion eggs and 2.1 million metric tons of broiler meat. The production level and availability of conventional feed ingredients is not increasing proportionately to meet the growing demand. These may be overcome by replacing conventional feed ingredients either by locally available and cheap unconventional ingredients or by nutritional manipulations like incorporation of vitamins, probiotics, enzymes and acidifiers in poultry diets to increase nutrient availability and uptake to improve feed conversion ratio (FCR). Detrimental effect of hot weather on the growth performance of broilers may be reduced by using herbal formulations and adopting proper feeding and managemental practices. For this, medicinal plants like Indian gooseberry/amla (*Emblica officinalis),* Ashwagandha (*Withania somnifera)*, Tulsi (*Ocimum sanctum)* and Shilajit have been used in poultry because of their antistress and performance enhancing properties. Keeping in view these facts the present experiment was designed to study the antistress effect of Indian gooseberry and multi-enzyme on the performance of broilers during hot humid weather.

*Corresponding author : rksharmahau@gmail.com

MATERIALS AND METHODS

The present study was undertaken during hot humid weather in broiler chicks from day old to 6 weeks of age at the Poultry Farm of the Department. Two hundred and forty, day-old, healthy commercial broiler chicks were procured from a local hatchery. The chicks were distributed into four groups [Control (C); T1 as C+1.0% Indian gooseberry/amla (*Emblica officinalis)* powder in feed purchased from the local market; T2 as C+0.05% multi-enzyme in feed and T3 as C+1.0% Indian gooseberry/amla (*Emblica officinalis)* powder+0.05% multi-enzyme in feed], having 4 replicates per group with 15 chick in each replicate. The chicks were reared under standard management techniques. The chicks were offered *ad libitum* mashed broiler ration, formulated according to the BIS (1992) specification. Before formulation of the broiler rations, the feed ingredients were analyzed (A.O.A.C., 1995) for proximate composition. Based upon the proximate composition of feed ingredients, the broiler starter and finisher ration were formulated (Table 1). Daily temperature and humidity of the house was recorded using six digital hygro thermometers, set at the birds height distributed throughout the house. The environmental temperature data was collected from the

Department of Agriculture Meterology, CCS HAU, Hisar.

Table 1
Composition of experimental diet (kg/100 kg feed)

Name of the ingredient	0-4 weeks	4-6 weeks
Maize	52.0	60.0
Soybean meal	30.0	21.0
Rice polish	10.0	10.0
Fish meal	5.5	6.5
Mineral mixture	2.5	2.5
Feed additives (g/100kg of ration)		
Spectromix (g)	10	10
Spectro BE (g)	20	20
Cocciwin (g)	50	50
Choline chloride (g)	50	50
Lysine (g)	50	50
DL-methionine (g)	150	150

Chicks were weighed individually at the start of experiment and later on biweekly basis to calculate gain in weight. A weekly record of feed intake was maintained for each experimental group. The FCR for each group was calculated by standard formula (feed consumed in gm/weight gain in gm). Performance Index (P.I.) was calculated by the formula advocated by Bird (1995). The data were subjected to statistical analysis as per Snedecor and Cochran (1994) using Completely Randomized Design (CRD) and means were compared by calculating critical difference (C.D.) at P<0.05.

RESULTS AND DISCUSSION

The mean body weight of day old chicks was about 46.50 g. Supplementation of Indian gooseberry and multi-enzyme has no significant effect on the average body weight and average body weight gain of broiler chicks among various treatments at different ages (Table 2). The present findings are comparable to Untoo (2010), who after supplementation of Indian gooseberry and probiotics either alone or in combination did not observe significant differences in body weight and body weight gain. Contrary to the results of the present study, Maini *et al.* (2007) reported better growth in broiler chicks with amla supplementation. The results of the present study with regards to supplementation of multi-enzyme are comparable to the findings of Omojola and Adesehinwa (2007), who also reported no significant improvement in body weight after enzyme supplementation in the birds. However, Hosamani *et al.* (2001) and Bhatt (2002) reported significantly (P<.005) higher body weight in birds fed diets supplemented with multi-enzyme.

Statistically no significant differences in the mean feed consumption at 14 and 28 days of age was observed amongst all the groups (Table 2). The feed consumption of broilers at 42 days of age was significantly higher (P<0.05) in control (3169.90 g) as compared to T1 and T3 (2670.80 g and 2831.30 g) groups, respectively (Table 2). These results indicated that the birds have tried to maintain similar body weights as of control group by consuming lesser feed. This may be due to the fact that amla supplementation, which is a richer source of vitamin C, alone or in combination with multi-enzyme had increased the tolerance level against hot weather. Vitamin C may be beneficial to poultry exposed to high ambient temperature by improving performances such as egg quality and digestibility of feed (Panda *et al.*, 2007). Analogous to the present findings, Omojola and Adesehinwa (2007) found that feeding of multi-enzyme at different level in the diet of three weeks old broilers did not improved feed intake. The results of the present findings can be correlated with the findings of Gous and Iji (2001) who reported a slight reduction in feed intake of broilers at five weeks of age when exogenous multi-enzyme was supplied through drinking water. Contrarily, Hosamani *et al*. (2001) reported that broiler chicks consumed more feed at 42 days of age on supplementation with multi-enzyme combinations.

Mean FCR and mean P.I. of broiler chicks at 14 days of age remained significantly better (P<0.05) in T3 than control group (Table 2). Statistically no significant differences in the mean FCR and mean P.I. at 28 days of age were observed amongst all the treatment groups. The mean FCR of birds differed significantly (P<0.05) at six weeks of age in T1 (2.12) as compared to T2 (2.39) and control (2.56). The P.I. was significantly better (P<0.05) at six weeks of age in T1 (601.91) and T3 (583.22) as compared to control (485.48). The results of this study are in agreement with that of Untoo (2010) who also reported that Indian gooseberry and probiotic supplementation in diet either alone or in combination showed significant difference in FCR. Similarly, Nakajothi *et al*. (2009) also reported better feed efficiency after addition of amla powder in the diet of broiler chicks. Significant improvement in FCR of broilers by multi-enzyme supplementation was also reported by Ahmed *et al*. (2004). Contrary to the finding of present study, Rao *et al.* (2000) and Hosamani *et al*. (2001) reported no significant change in FCR in broiler chicks fed multi-enzyme supplemented diet.

Table 2
Effect of Indian gooseberry and multi-enzyme on the performance of broiler birds

Parameter	Age	Control (C)	Indian gooseberry 1.0% (T1)	Multi-enzyme 0.05% (T2)	Indian gooseberry 1.0% + multi-enzyme 0.05% (T3)
Body weight (g/bird)	0-4 weeks	618.17^{a} ±19.16	604.50^{a} ±20.29	617.29^{a} ±17.69	609.66^{a} ±18.82
	0-6 weeks	1287.74^{a} ±36.41	1310.51^{a} ±35.82	1296.32^{a} ±30.92	1329.15^{a} ±30.61
Body weight gain (g/bird)	0-4 weeks	571.95^{a} ±19.22	558.30^{a} ±20.22	570.63^{a} ±17.55	564.07^{a} ±18.84
	0-6 weeks	1241.38^{a} ±36.50	1264.42^{a} ±35.70	1249.63^{a} ±30.77	1283.56^{a} ±30.52
Feed consumption (g/bird)	0-4 weeks	1526.66^{a} ±119.53	1365.00^{a} ±90.32	1465.59^{a} ±74.52	1414.65^{a} ±55.68
	0-6 weeks	3169.90^{a} ±131.07	2670.80^{b} ±97.82	2986.80^{ab} ±95.05	2831.30^{b} ±74.73
Feed conversion ratio	0-4 weeks	2.66^{a} ±.0.17	2.45^{a} ±0.17	2.57^{a} ±0.16	2.53^{a} ±0.13
	0-6 weeks	2.56^{a} ±0.05	2.12^{c} ±0.10	2.39^{ab} ±0.07	2.21^{bc} ±0.09
Performance index	0-4 weeks	216.76^{a} ±11.62	231.31^{a} ±15.37	225.11^{a} ±16.97	225.69^{a} ±20.09
	0-6 weeks	485.48^{b} ±16.13	601.91^{a} ±33.22	525.74^{ab} ±26.04	583.22^{a} ±36.57

Means bearing different superscripts in a row differ significantly ($P<0.05$).

It can be concluded that anti-stress effect of Indian gooseberry and multi-enzyme supplementation increased heat tolerance capacity of the bird and increased livability of the birds without compensating the performance.

REFERENCES

A.O.A.C. (1995). Official Methods of Analysis. (16th edn.), Association of Official Analytical Chemists, Arlington, Virginia, USA.

Ahmed, F., Rahman, M.S., Ahmed, S.V. and Miah, M.Y. (2004). Performance of broilers on phytase supplemented soybean meal based diet. *International J. Poult. Sci.* **3**: 266-271.

Bhatt, G.A. (2002). Effect of feeding multi-enzyme supplemented ration on the performance of broilers. *Indian J. Poult. Sci*. **37**: 278-279.

Bird, H.R. (1995).Performance index of growing chickens. *Poult. Sci.* **34**: 1163-1164.

BIS. (1992). Indian Standard, Poultry Feeds Specifications. Bureau of Indian Standards, 4th Review. Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi, India.

Gous, R.M. and Iji, P.A. (2001). Evaluating the route of administration of an exogenous microbial enzyme for broiler chicks. *J. Appl. Poult. Res.* **10**: 150-153.

Hosamani, S.V., Shivakumar, M.C., Kulkarni, V.S. and Harapanahalli, M.D. (2001). Effect of supplementing dietary enzyme on the performance of broilers. *Karnataka J. Agric. Sci*. **14**: 1046-1048.

Maini, S., Rastogi, S.K., Korde, J.P., Madan, A.K. and Shukla, S.K. (2007). Evaluation of oxidative stress and its amelioration through certain antioxidants in broilers during summer. *J. Poult. Sci.* **44**: 339-347.

Nakajothi, N., Nanjappan, K., Selvaraj, P., Jayachandran, S. and Visha, P. (2009). Production performance and blood biochemical changes in broiler chickens fed amla during induced-stress conditions. *Indian J. Anim. Sci.***79**: 1124-1126.

Omojola, A.B. and Adesehinwa, A.O.K. (2007). Performance and carcass characteristics of broiler chikens fed diets supplemented with graded levels of Roxazyme G. *International J. Poult. Sci.* **6**: 335-339.

Panda, A.K., Ramarao, S.V. and Raju, M.V.L.M. (2007). Effect of vitamin C supplementation on performance, immune response and antioxidant status of heat stressed White Leghorn layers. *Indian J. Poult. Sci.* **42**: 169-173

Rao, M.H., Reddy, V.R. and Ramsubba, V. (2000). Effect of feeding exogenous enzymes on performance of broilers. Proc. XX World Poultry Congress, 2000, New Delhi, India.

Snedecor, G.W. and Cochran W.A. (1994). Statistical Methods. (8th edn.), Oxford and IBH Publishing Company, Kolkata.

Untoo, M. (2010). Antistress effect of Indian gooseberry (*Emblica officinalis*) and probiotic on the performance of broilers during hot humid weather. M.V.Sc. thesis, CCS HAU, Hisar.