

Effect of Herbal Antioxidant Supplementation on the Performance of Broiler Chicks

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Abstract The present experiment was conducted on study the effect of herbal antioxidant supplementation (Aonla, Tulsi and Satawari) on the performance of broiler chicks. The experiment was conducted at university poultry farm. One hundred day old chicks were selected from university hatchery and divided into 4 groups G_1 , G_2 , G_3 and G_4 in each group 25 chicks were selected. The chicks of group first were served as control group, while G_2 , G_3 and G_4 were received control and herbal antioxidant supplementation (Aonla, Tulsi and Satawari) respectively. The

effect of the treatment on the performance of broiler chicks was studied upto 6 week of age. Different parameters were observed and the data were statistically analyzed for evaluating the effect of antioxidant supplementation in basal diet. From present investigation, it was concluded that application of herbal antioxidant supplementation (Aonla, Tulsi and Satawari) in the diet of broiler chicks improved the growth rate but did not show any effect on feed consumption. It was also concluded that the herbal antioxidant supplementation benefit for broiler chicks, the combination of Aonla, Tulsi and Satawari. The addition of Satawari (1%) was found to be best as compared to the addition of 1% Aonla and Tulsi.

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Introduction

The poultry farming in India occupies an important position due to its enormous potential to bring about rapid economic growth, particularly benefiting the weaker section due its low investment requirement and short gestation period. Now it has been transformed into a strong agro-based commercial activity having tremendous employability and income generation potential contributing nearly 0.7 % of the national GDP and about 9% of livestock GDP. India

is the 3rd largest egg producer and fifth position in broiler production in the world. Our poultry enterprises contribute approximately Rs 22,000 cores of the GNP and support the livelihood of 2.0 million people. Poultry sector is dubbed as the one having highest employability per unit of investment. In India the average per capita availability is still nearly 52 eggs and 2.3 kg of poultry meat against in recommended level of 180 eggs and 11 kg meat per annum.

Poultry feed accounts for about 60-70% of the total cost of production, which is one of the most serious challenges for the industry. Therefore, improving feed conversion efficiency (FCR) would be crucial to profitability apart from the feed cost itself. The porosity of feed and fodder is one of the major constraints in livestock and poultry production although the crop residues and agricultural by products are utilizing in livestock and poultry feeds, a shortage of feed and fodders continues to exist. Herbs are staging a comeback and herbal renaissance is happening all over the globe. The herbal products today symbolize safety in contrast to the synthetics that are regarded as unsafe to humans and environment. The drugs can be used the food supplements. A dietary supplement is a product taken by mouth that contains a dietary ingredient, intended to supplement or enhance the efficiency of the diet. The three formulations chosen for nutritive value analysis were single ingredient capsules of Aonla, Tulsi and Satawari. The Aonla consists of the fresh or dried fruit of *Emblica officinalis* (Aonla) is rich in farnins gallic acid, ellagic acid, glucose, pectin and vitamin C. Aonla is a very good liver tonic and gentle purgative. Vitamin C, thus showing anti-scorbutic activity due to content of 2nd highest amount of ascorbic acid.

Materials and Methods

The experiment was carried out at the poultry farm of Chandra Shekhar Azad University of agriculture and Technology, Kanpur during the year 2015 for 6 weeks (42 days) period. One hundred chicks were weighed individually and divided randomly into four groups. 25 chicks in each group G_1 , G_2 , G_3 and G_4 . G_1 group was served as control group, while G_2 , G_3

Table 1. Body weight g in broiler chicks of different groups at the different weeks of age.

Weeks	G_1	G_2	G_3	G_4
0	38.760	38.600	38.640	38.800
1	75.600	76.920	78.360	80.240
2	207.280	207.520	209.760	222.640
3	222.640	417.040	421.360	480.000
4	722.920	724.240	724.920	836.000
5	930.880	1020.200	1034.040	1035.240
6	1137.400	1223.920	1275.960	1293.320

and G_4 respectively, were used as treatment group and provided herbal antioxidant feed supplement 1% Aonla fruit powder, 1% Tulsi leaf powder and 1% Satawari root powder per day upto 6 weeks respectively. The data recorded were explain to statistical analysis by base on appropriate model analysis of variance according to the standard procedure. Critical difference (CD) with in the treatment was calculated in order to compare the treatment at 1% and 5% level of significance only.

Results and Discussion

Weekly body weight of different groups

Growth rate of all groups of chicks were measured at weekly interval and has been presented in Table 1.

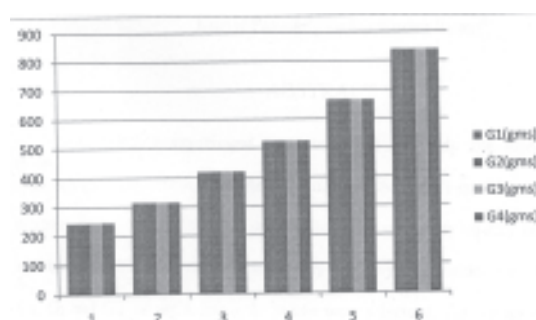


Fig. 1. Body weight g in broiler chicks of different group at the different week of age.

Table 2. Feed consumption in per broiler chicks of different groups and age.

Weeks	G ₁ (g)	G ₂ (g)	G ₃ (g)	G ₄ (g)
1	243.920	244.080	244.520	244.840
2	314.640	314.880	314.880	314.880
3	419.520	419.800	419.640	419.880
4	523.320	523.720	523.560	524.800
5	666.080	666.320	665.840	665.360
6	839.840	839.200	840.000	840.080
Total feed consumption	3007.32	3008.00	3008.44	3009.76

(Fig.1). The mean body weights during different period in different groups were 38.760, 38.600, 38.640 and 38.800 g/chick in day old chicks 75.600, 76.920, 78.360 and 80.240 g /chick in first week, 207.280, 207.520, 209.760 and 222.640 g/chick in second week, 222.640, 417.040, 421.360 and 480.000 g/chick in third week, 722.920, 724.240, 724.920 and 836.000 g/chick in fourth week, 930.880, 1020.200, 1034.040 and 1035.240 g/ chick in fifth week, 1137.400, 1223.920, 1275.96 and 1293.320 g/chick in sixth week in G₁, G₂, G₃ and G₄ respectively. Statistically, the higher significant difference were observed among all the treatment groups ($p < 0.05$). The higher body weight was observed by G₄ followed by G₃, G₂, G₁ respectively. It was found that the herbal extract of medicinal plant showed the growth promoting effect by supplementation of herbs in basal diet of broiler chicks [1]. A similar research work also concluded the role of herbal sources to improving the growth and performance of broiler chicks in the treated groups as compared to untreated groups [2].

Weekly body weight gain of different groups

Body weight gain of all groups of chicks was measured at weekly interval. The mean value of weight gain was 1098.640, 1185.320, 1240.32 and 1254.480g/chick in G₁, G₂, G₃ and G₄ respectively. It showed significant difference among different groups ($p < 0.05$). The weight gain was highest in G₄ followed by G₃, G₂ and G₁, where as G₃ was significantly higher from G₂ and G₁ and where G₂ were significantly higher from G₁. It was observed that the

body weight gain were significantly ($p < 0.05$) different in treated groups as compared to control group. It was also concluded the effect of herbal growth promoter on broiler performance which was better in treatment groups as compared to the control group [3]. The live weight gain, dressing percentage and profitability were significantly higher in treatment group when compared with control group.

Feed consumption

The mean value for feed consumption during different periods in different groups were 244.840, 243.920, 244.080 and 244.520 g/chick in first week, 314.800, 314.640, 314.880 and 314.880 g/chick in second week, 419.880, 419.520, 419.800 and 419.640g/chick in third week, 524.800, 523.320, 523.720 and 523.560 g/chick in fourth week, 665.360, 666.080, 666.320 and 665.840g/chick in fifth week, and 840.080, 839.840, 839.200 and 840.000g/chick in sixth week in G₁, G₂, G₃ and G₄ respectively. (Table 2). The total feed consumption during this experiment was found slightly differed among all groups. However, in groups G₄ slightly higher was noticed followed by group G₃, G₂ and G₁ respectively. The non-significant differences were found in feed consumption among different groups ($p > 0.05$). Similarly results was showed that the supplementation of herbs in broilers was enhanced the FCR, mortality were also lower in the herbal supplemented groups [4]. The addition of herbal extract in the feed of broiler, significantly improved feed efficiency of broiler significantly [5]. The similar result showed that the feed conversion efficiency (FCE) was insignificantly different among the different group by supplementation of herbs in basal diet [6].

Feed conversion ratio

The mean values of FCR were 2.744, 2.532, 2.416 and 2.296 g/chick in G₁, G₂, G₃ and G₄ respectively. The FCR was highest in G₁ followed by G₄, G₃ and G₂ where as G₄ was significantly higher from G₂ and G₃. In the present study the better performance observed in FCR in treatments groups as compared to control group. Previously it was observed that addi-

Table 3. Benefit cost ratio in broiler chicks.

Particulars	(Control) G ₁	(Aonla %) G ₂	(Tulsi %) G ₃	(Sata- wari %) G ₄
Cost/Bird (Rs)	20.00	20.00	20.00	20.00
Feed cost per bird (Rs)	63.00	64.00	64.00	64.00
Herbal liver (Rs)	—	6.00	15.00	17.00
Labor cost/bird (Rs)	6.00	6.00	6.00	6.00
Miscellaneous (Rs)	2.00	2.00	2.00	2.00
Total cost of production (Rs)	91.00	98.00	107.00	109.00
Sale/bird (Rs)	110.00	128.00	136.00	144.00
Sale of other (Rs)	1.50	1.50	1.50	1.50
Net income (Rs)	111.50	129.50	137.50	145.50
Net profit/Bird (Rs)	20.50	31.50	30.00	36.50
Benefit cost ratio	1.22	1.32	1.28	1.33

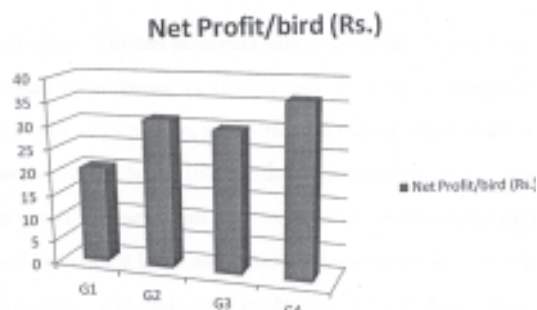
tion of Livlif in diet of broiler has beneficial effect to some extent on body weight gain, feed consumption and feed conversion efficiency. Similar results were also represented that the supplementation of herb in feed to enhance the performance of broiler chick [7].

Economics of broiler production

The total expenditure includes the cost of day old broiler chick electricity charges, labor charges and the total feed required to produce live weight gain of the broiler. The cost of different experimental diets (Starter and Finisher) as shown in Table 3 has been calculated on the basis of the current prices of the feed ingredients. (Fig.2). The data revealed the average/bird was 20.50, 31.50, 30.00 and 36.50 (Rs) in G₁, G₂, G₃ and G₄ respectively. Thus, it can be concluded that the Satawari feed supplement at 1% level or group G₄ was beneficiary in broiler chick ration. It is clearly showed that profit and cost benefit ratio increase with the application of herbal growth promoter in diet.

Conclusion

From present investigation, it was concluded that the application of herbal antioxidant supplementation

**Fig. 2.** Benefit cost ratio in broiler chicks.

(Aonla, Tulsi and Satawari) in the diet of broiler chicks improved the growth rate but did not show any effect of feed consumption. It was conducted that the herbal antioxidant supplementation benefit for day old chicks i.e. Aonla, Tulsi and Satawari and these Satawari (1%) were found is best as compared to Aonla and Tulsi.

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