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Effect of Herbal Liver Stimulant on The Performance of Broiler Chicks

Neeraj Kumar Gupta, Manoj Kumar Singh, Chandra Shekhar Singh, Ram Jee Gupta, Vinod Kumar Paswan

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Abstract The performance and profitability of poultry birds largely depends upon improved feed conversion efficiency, body weight, absence of diseases and low mortality. Liver is the vital organ in the body responsible for several important functions and any disturbance to it leads to poor performance of the flock. Impaired liver functions or hypoactive sluggish liver in the poultry birds, directly or indirectly affect vital functions and result in poor utilization of feed. This results in low productivity, frequent disease outbreak and poor FCR. 100 DOC were selected from university hatchery and divided into four groups G_1, G_2, G_3 and G_4 each group has 25 chicks. The chicks of group G_1 served as control, while groups G_2, G_3 and G_4 were fed broiler starter ration + 3, 6 and 9 ml liver tonic Broton/100 chicks/day upto 0 to 3 weeks and 4 to 6 weeks were fed broiler starter ration + 6, 9 and 12 ml liver tonic Broton/100 chicks/day. The results showed application of liver tonic Broton in the diet of broiler chicks improved growth rate without any effect on feed consumption. The highest dressing percentage and lower mortality rate was found in G_4 (12 ml liver tonic Broton/100 chicks/day) followed by G_1, G_2 and G_3.

Keywords Broiler, Feed conversion ratio, Body weight, Broton, Mortality rate.

N. K. Gupta, M. K. Singh, R. J. Gupta
Assistant Professor,
Department of Animal Husbandry and Dairying
CSAUA & T Kanpur (UP), India

C. S. Singh*
Center of Food Science and Technology,
Institute of Agricultural Sciences,
BHU, Varanasi (UP) 221005, India

V. K. Paswan
Assistant Professor,
Department of AH and Dairying,
Institute of Agricultural Sciences,
BHU, Varanasi (UP) 221005, India
e-mail : chandrassingh007@gmail.com
*Correspondence

Introduction

Poultry sector is dubbed as the one having highest employability per unit of investment. The Indian poultry sector with 7.3% growth in poultry population, has witnessed one of the fastest annual growth of about 6% in eggs and 10% in meat production over the last decade amongst all animal based sectors.The high growth has placed India at 3rdposition after China and USA with a production of 59.8 billion eggs and 5th after USA, China, Brazil and Mexico with a production of 2.6 mmt of chicken meat during 2009-10. De-

Table 1. The feeding regimes of chicks during experimental period.

	0 weeks to 3 weeks
G_1	Control (Broiler starter ration only)
G_2	Broiler starter ration + 3 ml Broton/100 chicks/day
G_3	Broiler starter ration + 6 ml Broton/100 chicks/day
G_4	Broiler starter ration + 9 ml Broton/100 chicks/day
	4 weeks to 6 weeks
G_1	Control (Broiler starter ration only)
G_2	Broiler starter ration + 6 ml Broton/100 broiler chicks/day
G_3	Broiler starter ration + 9 ml Broton/100 broiler chicks/day
G_4	Broiler starter ration + 12 ml Broton/100 broiler chicks/day

Table 2. Chemical composition of broiler ration.

Ingredients	Starter ratio	Finisher ration
Yellow maize	60.00	61.50
Wheat bran	6.00	10.75
Soybean meal	22.00	18.50
Fat	1.00	1.00
Fish meal	8.00	2.25
Mineral mixture	2.00	2.25
Common salt	0.25	0.25
Vitamin mixture	0.25	0.50
L-lysine	0.15	0.10
DL-methonine	0.10	0.15

spite such progress, the average per capital availability is still nearly 52 eggs and 2.3 kg of poultry meat against the recommended levels of 180 eggs and 11 kg meat per annum. India's 75% of poultry produce is consumed by the 25% population living in urban and semi urban areas. It has been estimated that under moderate growth scenario of 6% per annum in the country's GDP, by 2030, the demand for meat and eggs is likely to shoot up to 5.9 and 9.5 mmt respectively.

The organized sector of Indian poultry industry contributes nearly 70% of the total output whereas the rest emanates from the unorganized sector. The broiler industry is well dominated in the southern states accounting for nearly 60–70% of total output. Similar is the case with the layer industry which is well developed in the states of Andhra Pradesh, Tamil Nadu and Maharashtra contributing nearly 70% of the country's egg production.

Regional imbalances in poultry production are inevitable since both large commercial egg and broiler production farms are mainly confined to the southern states, apart from Maharashtra, Punjab, Uttarakhand and Haryana in the north. More than 60% of eggs are produced in AP, Haryana, Maharashtra, Punjab and TN States, whereas more than 60% of poultry meat is produced in 5 states namely AP, Karnataka, Maharashtra, Punjab and WB. However, poultry production, particularly broiler farming is gradually catching up in some deficit northern, central and eastern regions of the country in the recent years. The commercial poultry farming is yet to make a dent in some of the most populous states like Bihar, MP, Orissa, Rajasthan and UP.

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 would be crucial to profitability apart from the feed cost itself. Over the past two decades, feed conversion rates for poultry have improved by about 40%, partly due to improved productivity and partly due to efficient feeding strategies. However, still only 25–35% of the nutrients consumed are utilized. Hence, further understanding of digestive physiology and biochemistry can be expected to improve nutrient utilization.

Materials and Methods

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 and G_4 respectively used as treatment group and provided herbal liver stimulant feed supplement @ 3, 6 and 9 ml/100 chicks/day up to 3 weeks and from 4 to 6 weeks @ 6, 9 and 12 ml/100 chicks/day respectively. The broiler starter and finisher ration were purchased from UP Agro Industries Feed Factory, Lucknow. Feeding trial was conducted for 6 weeks. The feeding regimes of chicks during

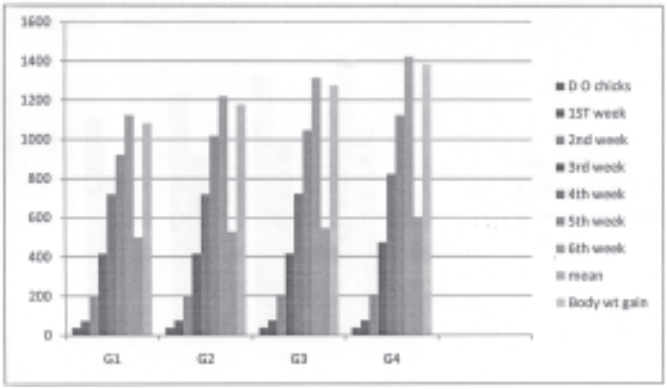

Fig. 1. Effect of treatment on body weight (g/chicks) during different period.

experimental period have been presented in Table 1.

Each group as given weighed feed in the morning and residue were collected individually weight were taken after seven days to find out feed consumption during the week for the broiler chicks. Normal management conditions were provided.

Management practices

The experiment was conducted from 18th March to 30 April 2015. Each group was fed equal quantity of broiler feed in morning at 8.00 am and evening at 5.00 pm daily. Feeder and water trays were cleaned and disinfected before using for experiment. Feeders and water trays were cleaned every day and supplied feed and treated water ad-libitum. Equal amount of feed and water were provided for each group. Chemical analysis of feed, residues, excreta, dry matter, crude protein, ether extract, crude fiber, ash, nitrogen free extract and organic matter recommended by AOAC method. The chemical composition of animal feed has been given in Table 2.

Results and Discussion

The average body weights of day old chick were 39.12 (±0.291), 39.07 (±0.291), 39.07 (±0.291) and 39.06 (±0.291) g/chick in G_1, G_2, G_3 and G_4 respectively (Table 3). There was non-significant difference observed in body weight by among groups (p>0.05) (Fig. 1). The average body weights in first week were 73.88 (±1.142), 75.40 (±1.142), 76.00 (± 1.142) and 76.44 (±1.142) g/chick in G_1, G_2, G_3 and G_4 respectively. There was non-significant difference observed in body weight by among groups (p>0.05). The average body weights in second week were 204.96 (±1.339), 205.720 (±1.339), 207.40 (±1.339) and 208.16 (±1.339) g/chick in G_1, G_2 G_3 and G_4 respectively.

Table 3. Effect of treatment on body weight (g/chicks) during different period.

Treatments	Day old chicks	1st week	2nd week	3rd week	4th week	5th week	6th week	Mean	Body weight gain
G_1	39.12	73.88	204.96	417.52	720.48	922.56	1123.76	500.32	1084.75
G_2	39.07	75.40	205.72	417.16	719.84	1017.68	1219.16	527.71	1180.08
G_3	39.07	76.00	207.40	418.36	722.04	1047.68	1316.00	546.65	1276.92
G_3	39.06	76.44	208.16	474.68	823.56	1124.72	1425.28	595.98	1386.22
SE (d)	±0.291	±1.142	±1.339	±3.298	±2.103	±3.108	±2.643		±39.298

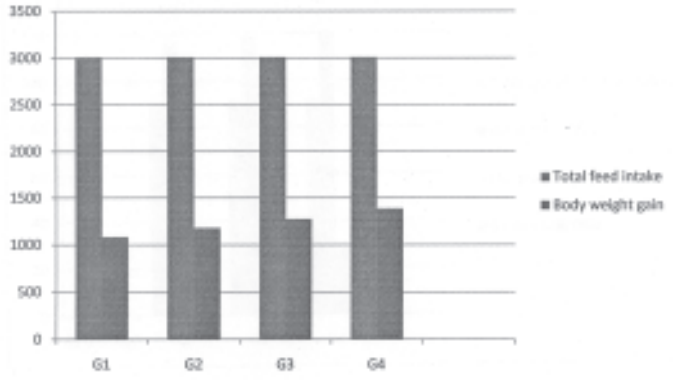

Fig. 2. Effect of treatment on feed consuption (g/chicks) during different period.

There was non-significant difference observed in body weight by among groups (p>0.05). The average body weights in third week were 417.52 (±3.298), 417.16 (±3.298), 418.36 (±3.298) and 474.68 (±3.298) g/chick in G_1, G_2, G_3 and G_4 respectively. It showed significantly difference among different groups (p<0.05). The critical showed G_4 significantly higher than G_3, G_1 and G_2. The average body weights in fourth week were 720.48 (±2.103), 719.84 (±2.103), 722.04 (±2.103) and 823.56 (±2.103) g/chick in G_1, G_2, G_3 and G_4 respectively. It showed significantly difference between different groups (p<0.05). The critical difference showed G_4 were significantly higher than G_3, G_2 and G_1. The average body weights in fifth week were 922.56 (±3.108), 1017.68 (±3.108), 1047.68 (±3.108) and 1124.72 (±3.108) (g) in G_1, G_2, G_3 and G_4 respectively. It showed significantly difference among different groups (p<0.05). The weight was highest in G_4 followed by G_3, G_2 and G_1. The average body weights in sixth week were 1123.76 (±12.643), 1219.16 (±12.643),1316.00 (±12.643) and 1425.28 (±12.643) g/chick in G_1, G_2, G_3 and G_4 respectively.

A studied on the animal showed the effect of prebiotic (MOS) and antibiotic as feed additives on satisfactory increased in growth performance [1]. It was observed that the mean total body weight gain were significantly (p<0.05) different in treated groups as compared to control group [2]. The role of herbal sources in improving the growth and performance and significantly increased the mean body weight gain, mean final body weight, seed efficiency was observed in the treated groups as compared to untreated groups [3].

The effect of herbal growth promoter on broiler performance was better in treatment than the control group [4]. The live weight gain, dressing percentage and profitability were significantly higher in treatment group when compared with control group. It showed

Table 4. Effect of treatment on feed consumption (g/chicks) during different period.

Treatments	1st week	2nd week	3rd week	4th week	5th week	6th week	Total feed intake	Body weight gain	FCR
G_1	244.88	314.88	419.88	524.88	664.88	839.88	3009.28	1084.75	2.77
G_2	244.88	314.88	419.88	524.88	664.88	840.68	3009.28	1180.48	2.54
G_3	244.88	314.88	419.88	524.88	664.88	840.28	3009.28	1276.92	2.35
G_3	244.88	314.88	419.88	524.88	638.44	839.88	3009.76	1386.22	2.17
SE (d)	±0.736	±0.736	±0.794	±0.736	±18.82	±0.805	±4.373	±2.635	±0.006

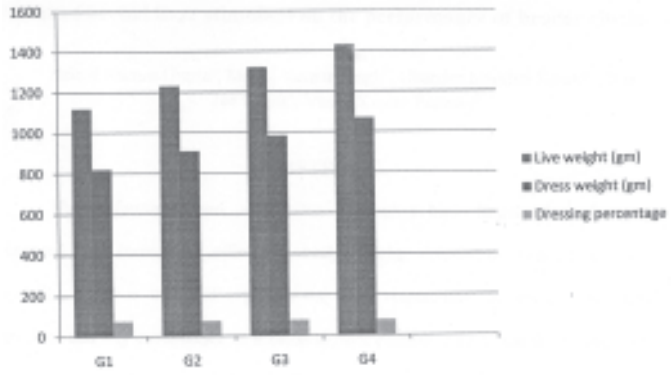

Fig. 3. Effect of treatment on dressing percentage.

significantly difference among different groups (p<0.05). The critical difference showed G_4 significantly higher than G_3, G_2 and G_1. The result showed that the significant difference was sound among different groups (p<0.05). The treatment groups had gained more live weight as compared to control groups. In treatment group the weight gain was increased with application of herbal growth promoter (Broton).

The mean values of weight gain were 1084.75±39.298, 1180.08±39.298, 1276.92±39.298 and 1386.22±39.298 g/chick in G_1, G_2, G_3 and G_4 respectively. It showed significant difference among different groups (p<0.05). The weight gain was highest in G_4 followed by G_3, G_2 and G_1. Whereas G_3 was highest significantly higher from G_2 and G_1, where G_2 was significantly higher from G_1.

The feed consumption values in first week were 244.88 (±0.736), 244.88 (±0.736), 244.88 (±0.736) and 244.88 (±0.736) g/chick in G_1, G_2, G_3 and G_4 respectively (Table 4). Non-significant difference were observed in feed consumption by among groups (p>0.05) (Fig. 2). The feed consumption values in second week were 314.88 (±0.736), 314.88 (±0.736), 314.88 (±0.736) and 314.88 (±0.736) g/chick in G_1, G_2, G_3 and G_4 respectively. There was non-significant difference recorded in feed consumption by among groups (p>0.05).

The feed consumption values in third week were 419.88 (±7.094), 419.88 (±7.094), 419.88 (±7.094) and 419.88 (±7.094) g/chick in G_1, G_2, G_3 and G_4 respec-

Table 5. Effect of treatment on dressing percentage.

Treatment groups	Live weight (g)	Dress weight (g)	Dressing percentage
G_1	1120	819.28	73.15
G_2	1230	908.85	73.89
G_3	1322	982.11	74.29
G_4	1430	1070.35	74.85
Mean	1275.50	945.15	74.05
SE(d)	±1.225	±2.041	±0.122
CD 1%	3.216	5.363	0.328

Table 6. Cost benefit analysis of broiler chicks.

Particulars	G_1 (Control)	G_2 (Broton 3 ml)	G_3 (Broton 6 ml)	G_4 (Broton 9 ml)
Cost/Bird (Rs)	18.00	18.00	18.00	18.00
Feed cost per bird (Rs) 64.00		64.00	64.00	64.00
Herbal lever (Rs)	–	0.60	1.80	2.70
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)	90.00	90.30	91.80	92.70
Sale/bird (Rs)	110.00	115.00	117.00	119.00
Sale of other (Rs)	1.50	1.50	1.50	1.50
Net income (Rs)	111.50	116.50	118.50	120.50
Net profit/bird (Rs)	21.50	26.20	26.70	27.80
Benefit cost ratio	1.24	1.29	1.29	1.30

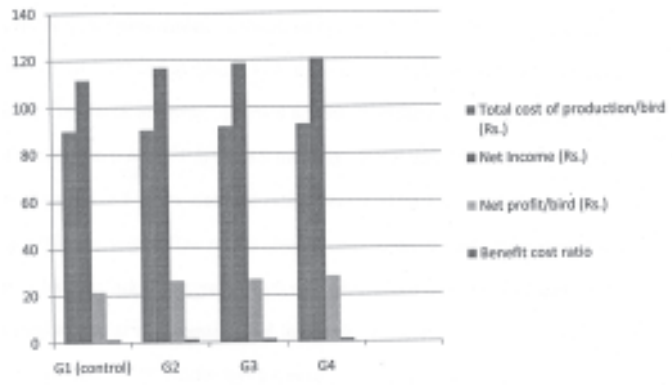

Fig. 4. Cost benefit analysis of broiler chicks.

tively. There was non-significant difference recorded in feed consumption by among groups (p>0.05). The feed consumption values in fourth week were 524.88 (±0.736), 524.88 (±0.736), 524.88 (±0.736) and 524.88 (±0.736) g/chick in G_1, G_2, G_3 and G_4 respectively. There was non-significant difference recorded in feed consumption by among groups (p>0.05).

The feed consumption values in fifth week were 664.88 (±18.824), 664.88 (±18.824), 664.88 (±18.824) and 664.88 (±18.824) g/chick in G_1, G_2, G_3 and G_4 respectively. There was non-significant difference observed in feed consumption by among groups (p>0.05). The feed consumption values in sixth week were 839.88 (±0.805), 839.88 (±0.805), 839.88 (±0.805) and 839.88 (±0.805) g/chick in G_1, G_2, G_3 and G_4 respectively. There was non-significant difference observed in feed consumption by among groups (p>0.05). Total feed intake values were 3009.040, 3009.280, 3009.280 and 3009.760 g/chick in G_1, G_2, G_3 and G_4 respectively.

There was non-significant difference in recorded feed intake by among groups (p>0.05). It was observed that the 42 days body weight of broilers was significantly higher in the herbal group compared to the control group. Feed intake, FCR, mortality were also lower in the herbal group [5]. Similarly many research found that the body weight, better feed efficiency and lower mortality were recorded significantly in treated groups [6—8].

The mean values of FCR were 2.772±0.006, 2.546±0.006, 2.354±0.006 and 2.176±0.006 g/chick in G_1, G_2, G_3 and G_4 respectively. The FCR was highest in G_1 followed by G_4, G_3 and G_1, where as G_4 was significantly higher from G_2 and G_3. Dressing percentage analysis (Table 5) indicates that significantly (p<0.05 (Fig. 3). Highest 74.85% are G_4 group and lowest 73.89% are G_1 group. G_4 group (Broton 12 ml) in more significantly (p<0.05) followed by G_3 (9 ml), G_2 (6 ml) and lowest in G_1 group. Mortality rate was also found, lowest in the treatment of Broton (12 ml). Cost of benefit analysis (Table 6) indicates that significantly (p<0.05) maximum investment per bird (Rs 92.70) was done in case of G_4 group than the G_1 group investment per bird (Rs 90.00) (Fig. 4). The variation is expenditure depends mainly on the liver stimulant (Broton). On the other hand, a significantly (p<0.05) highest in per bird (Rs 119.00) income was achieved from G_4 group and lowest in per bird (Rs 110.00) from G_1 group. The broiler kept under G_4 group significantly (p<0.05) highest margin of profit followed by G_3, G_2 and lowest in case of G_1 group.

Conclusion

In present research, it was concluded that the application of liver tonic Broton in the diet of broiler chicks

improved the performance and profitability of poultry birds and also improved the FCR of the broiler chicks significantly. It was revealed that the application of 12 ml liver tonic Broton/100 chicks/day in the diet of broiler chicks improved growth rate without any effect on feed consumption. The highest dressing percentage and lower mortality rate was found in G_4 as compared to the G_1, G_2 and G_3 groups.

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