

Studies on Supplementation of Some Commercial Feed Additives on Performance of Babcock Cockerels

Deepak Thakur, V. N. Khune, Y. P. Chandra,
Arvind K. Nandanwar

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Abstract The study was conducted on male chicks of Babcock strain in the experimental poultry unit to study the effect of supplementation of three commercially available feed additives viz., Ambiplex, Protexin and Metazyme on growth performance. The day old cockerel chicks were assigned to four different dietary treatments including control group for 10 weeks period. Each treatment and control group had three replicates of 15 birds each. Standard management practices similar to layer chicks were followed throughout the study period. Supplementation of Ambiplex, Protexin and Metazyme had non-significant effect on body weight of Babcock cockerel chicks in all age groups (1 to 10 weeks) under study as compared to the control. However, results indicated that supplementation of the feed additives had significant effect

on increasing feed consumption of the cockerel chicks during starter phase (0—5 weeks). However, this significant effect was lost in finisher stage (6—10 weeks). Therefore these feed additives are, may be recommended during starter (0—5 weeks) period to restore feed consumption during stressful condition in cockerel birds, which will yield best economical results to the poultry farmers by giving better growth as well as feed conversion ratio.

Keywords Cockerel, Supplementation, Ambiplex, Protexin, Metazyme.

Introduction

India is third largest egg producer and fifth chicken meat producer in the world with about 60 billion eggs and 2.2 million metric tons of chicken meat. Poultry farming in India has transformed into a techno-commercial industry from the status of backyard farming since three decades. Cockerel, the egg type male chicks are by-products of layer hatcheries. Cockerels are slow growing (male layer) birds usually raised for their meat, which female lines have been selected over many generations for high egg production while the males have been less selected. In developed countries, these chicks have no market. Therefore they are invariably destroyed and converted into male chick or meat meal, by a rendering process and are used in various animal feeds, as a substitute for fish meal. But in India, such rendering plants are not popular. Moreover, there is sufficient demand for egg-type

D. Thakur*
Subject Matter Specialist, Krishi Vigyan Kendra, Raigarh
496001 (CG), India

V. N. Khune
Assistant Professor, Chhattisgarh Kamdhenu Vishwavidyalaya,
Durg 491001 (CG), India

Y. P. Chandra
Veterinary Assistant Surgeon, Chhattisgarh Livestock Development Department, Raigarh 496001 (CG), India

Arvind K. Nandanwar
Subject Matter Specialist, Krishi Vigyan Kendra, Dhamtari
493773 (CG), India
e-mail: deepakthakur5444@gmail.com
*Correspondence

male chicks for meat production. Studies regarding improving performance of cockerel birds by addition of different feed additives would give precision to feeding management of this special category of farming. In cockerel, different types of commercial growth promoters and multienzyme supplements are utilized to enhance weight gain and improve feed efficiency by Bhonsle [1]. There were lots of works on feed additive supplementation in broiler diet by Narhari and Ahmed [2]. However, such information is scanty in cockerels. Hence present study was carried out to determine the effect of supplementation of major feed additives i.e. Ambiplex (contain nutritional value per 5 ml -Vitamin B₁-7.0 mg, Vitamin B₂-2.5 mg, Vitamin B₆-1.0 mg, Vitamin B₁₂-12.5 mcg, Biotin-25.0 mcg, Calcium Pantothenate-2.5 mg, Niacin-75.0 mg, Choline Chloride -10.0 mg, Methionine-10.0 mg, Lysine-20.0 mg), Protexin (contain Each 1g of Protexin contain *Lactobacillus plantarum* 1.26×10^8 cfu/g, *Lactobacillus bulgaricus* 2.06×10^8 cfu/g, *Lactobacillus acidophilus* 2.06×10^8 cfu/g, *Lactobacillus casei* 2.06×10^8 cfu/g, *Streptococcus thermophilus* 4.10×10^8 cfu/g, *Streptococcus faecium* 5.40×10^8 cfu/g, *Bifidobacterium bifidum* 2.00×10^8 cfu/g, Yeasts-Torulopsis species 5.32×10^7 cfu/g and *Aspergillus oryzae* 5.32×10^7 cfu/g, Total viable count 2×10^9 cfu/g and metazyme BP (contain Cellulase, Hemicellulase, Pectinase, B mannanase, Xylanase, Phytase, B Glucanase, Protease, Amylase, Lipase with additional phytase activity of 200 FYT/g) on performance and economics in Babcock cockerel birds.

Materials and Methods

One hundred eighty number of day old BV 300 strain of Babcock cockerel chicks were randomly distributed into four experimental groups, comprising three replicates with 15 chicks each. The chicks of all groups were reared in separate individual floor pens (3'×5') on litter made up of rice husk and offered basal diet i.e. cockerel starter and finisher ration for 0—5 and 6—10 weeks, respectively. The cockerel starter feed (0—5 weeks) contained 18.9, 3.4, 5.2, 30.9, 9.2 and 4%, while the cockerel finisher ration (6—10 weeks) contained 19.5, 2.1, 6.2, 32.2, 9.4, 4.1% of protein, fat, fiber, starch, ash and sugar, respectively. Standard management practices similar to layer chicks were followed

in experimental poultry unit during brooding and finisher stages.

One group was maintained as control (T₁) and rest three groups were supplemented with different commercial feed additives i.e., Ambiplex (T₂) @ 5–6 ml/100 birds for chicks and 8—10 ml/100 birds for grower, Protexin (T₃) @ 1g/lit of water and Metazyme BP (T₄) @ 250 g/ton of feed respectively. Beak trimming was performed at 25th day of age. Feed and water were offered *ad libitum* throughout the experimental period of 10 weeks. Body weight recorded on individual bird basis and feed intake and feed conversion ratio (FCR) was recorded replicate wise at weekly intervals. The mean performance index was calculated on the basis of body weight and feed conversion ratio at 70th day of age. The data were analyzed using one way ANOVA and for test of significance Duncan's Multiple Range Test (DMRT) was performed as per the method used by Karagolu and Durdag [3] described by Snedecor and Cochran.

Results and Discussion

In present investigation, birds gained a mean body weight of 884.30 ± 8.08 , 865.29 ± 8.23 , 873.67 ± 18.43 and 882.69 ± 1.39 g for T₁ (Control), T₂ (Ambiplex), T₃ (Protexin), and T₄ (Metazyme) groups respectively up to 10 weeks of age. From 1st week to 10th week of age the cockerels of different groups showed a descending order of mean body weight of T₁, T₄, T₃ and T₂ groups during weekly intervals. Non significant differences were observed among these groups during 1st, 2nd, 6th, 9th and 10th weeks of age non-significantly ($p < 0.05$) higher mean body weight was observed in the control group than the feed additive supplemented treatment groups for most of the weeks during the experimental period (Table 1). Islam et al. [4] carried out experiment on broilers and concluded that the use of probiotic at different levels did not significantly affect the performance of broilers. Ranade et al. [5] reported that no significant differences in final body weight ($p > 0.05$) after phytase enzyme supplementation in broiler chicks. Rambabu et al. [6] also reported that no significant differences ($p > 0.05$) were observed in the weight gain values from the different levels of methionine included in the broiler starter.

Table 1. Mean ($\pm$ SE) body weight (g) of cockerels under different treatment groups. Means bearing different superscripts in a row differed significantly ($p < 0.05$).

Week	T ₁ (control)	T ₂	T ₃	T ₄
1 st	68.05 $\pm$ 1.26	66.70 $\pm$ 1.61	66.82 $\pm$ 0.75	67.79 $\pm$ 0.47
2 nd	115.00 $\pm$ 1.33	111.97 $\pm$ 2.22	112.75 $\pm$ 0.58	115.31 $\pm$ 1.27
3 rd	174.35 $\pm$ 1.82 ^a	163.13 $\pm$ 0.50 ^b	167.44 $\pm$ 4.08 ^{ab}	169.33 $\pm$ 2.16 ^{ab}
4 th	230.72 $\pm$ 3.15 ^a	208.97 $\pm$ 3.95 ^b	210.50 $\pm$ 3.12 ^b	222.10 $\pm$ 2.71 ^a
5 th	288.52 $\pm$ 7.00 ^a	262.82 $\pm$ 3.82 ^b	262.46 $\pm$ 6.51 ^b	280.49 $\pm$ 3.42 ^{ab}
6 th	385.62 $\pm$ 8.22	365.29 $\pm$ 5.36	370.13 $\pm$ 6.29	385.20 $\pm$ 3.74
7 th	531.25 $\pm$ 6.93 ^a	512.02 $\pm$ 3.43 ^{bc}	506.87 $\pm$ 6.37 ^c	525.31 $\pm$ 3.62 ^{ab}
8 th	656.38 $\pm$ 7.39 ^a	624.93 $\pm$ 6.09 ^b	628.02 $\pm$ 12.63 ^b	646.22 $\pm$ 4.58 ^{ab}
9 th	764.88 $\pm$ 9.53	739.27 $\pm$ 6.92	742.56 $\pm$ 14.29	762.02 $\pm$ 2.90
10 th	884.30 $\pm$ 8.08	865.29 $\pm$ 8.23	873.67 $\pm$ 18.43	882.69 $\pm$ 1.39

Overall in present experiment, significantly ($p < 0.05$) higher mean weekly feed consumption was noticed due to feed additives supplementation over the control diet during starter phase (0—5 weeks) (Table 2). Similarly Fatufe and Matanmi [7] had reported that probiotics supplementation to broiler diets showed greater feed intake ($p < 0.05$). Nanda and Sikka [8] observed four dietary levels of methionine 0, 100, 120 and 130% of NRC recommendation significantly ($p < 0.05$) affected feed intake. Rezaei et al. [9] reported supplementing phytase at different dietary non phytate phosphorus levels in broilers significantly ($p < 0.05$) feed consumption during 1 to 3 weeks of age.

However during finisher phase (6—10 weeks) the mean weekly feed consumption of different treatment groups had shown non-significant differences from those of the control group (Table 2). Adeyemo [10] reported non significant ($p < 0.05$) effect of probiotic supplementation on Kuroiler FFG strain

chicks in feed intake. Chae et al. [11] also reported that feed intake in Babcock cockerels was not affected by enzyme supplementation. Nanda and Sikka [8] reported that feed intake was not improved by 120% NRC methionine in broiler birds. These findings indicate that though nutrient consumption has increased due to the feed additives supplementation, they failed to increase the nutrient utilization in cockerel birds.

Overall from the data depicted in (Table 3) it was observed that the mean cumulative FCR of T₁ (Control) group has shown a steadily increasing trend from 1st to 10th week period. The T₂, T₃ and T₄ groups have shown a sharp rise in mean cumulative FCR up to 4th week (due to increase in feed intake in these groups) and then steady decline up to 7th week and again rise up to 10th week period. The mean feed conversion ratio was found to be better in control group throughout the experiment. The mean cumulative FCR for T₁ (Control), T₂, T₃ and T₄ groups at the end of 10th week were 2.98 $\pm$ 0.04, 3.08 $\pm$ 0.09, 3.05 $\pm$ 0.08 and 3.02 $\pm$ 0.04 re-

Table 2. Mean ($\pm$ SE) weekly feed consumption (g) of cockerels under different treatment groups. Means bearing different superscripts in a row differed significantly ($p < 0.05$).

Week	T ₁ (control)	T ₂	T ₃	T ₄
1 st	52.26 $\pm$ 1.49 ^b	58.57 $\pm$ 1.27 ^{ab}	53.35 $\pm$ 3.76 ^{ab}	60.41 $\pm$ 1.28 ^a
2 nd	97.55 $\pm$ 1.28 ^c	104.20 $\pm$ 5.50 ^{bc}	112.31 $\pm$ 2.02 ^{ab}	116.24 $\pm$ 2.79 ^a
3 rd	148.40 $\pm$ 0.82 ^b	199.71 $\pm$ 7.80 ^a	189.00 $\pm$ 6.99 ^a	183.22 $\pm$ 7.19 ^a
4 th	177.72 $\pm$ 3.34 ^b	200.97 $\pm$ 6.60 ^a	197.37 $\pm$ 5.41 ^a	183.91 $\pm$ 4.85 ^{ab}
5 th	181.33 $\pm$ 10.34	180.18 $\pm$ 3.74	174.86 $\pm$ 12.60	167.78 $\pm$ 1.61
6 th	261.80 $\pm$ 6.35	250.20 $\pm$ 14.78	255.66 $\pm$ 10.10	262.38 $\pm$ 5.22
7 th	382.92 $\pm$ 29.79	365.89 $\pm$ 28.42	372.22 $\pm$ 7.09	369.29 $\pm$ 23.03
8 th	366.63 $\pm$ 15.03	379.96 $\pm$ 25.11	383.89 $\pm$ 6.91	393.60 $\pm$ 9.65
9 th	409.35 $\pm$ 17.81	389.82 $\pm$ 1.39	392.66 $\pm$ 6.10	387.71 $\pm$ 10.29
10 th	442.08 $\pm$ 24.35	417.84 $\pm$ 6.17	419.00 $\pm$ 8.88	427.33 $\pm$ 15.03

Table 3. Mean ($\pm$ SE) cumulative feed conversion ratio of cockerels under different treatment groups. Means bearing different superscripts in a row differed significantly ($p < 0.05$).

Week	T ₁ (control)	T ₂	T ₃	T ₄
1 st	1.69 $\pm$ 0.06	1.97 $\pm$ 0.11	1.79 $\pm$ 0.17	1.97 $\pm$ 0.07
2 nd	1.93 $\pm$ 0.05 ^b	2.17 $\pm$ 0.08 ^a	2.19 $\pm$ 0.07 ^a	2.27 $\pm$ 0.03 ^a
3 rd	2.18 $\pm$ 0.02 ^b	2.87 $\pm$ 0.11 ^a	2.73 $\pm$ 0.16 ^a	2.73 $\pm$ 0.08 ^a
4 th	2.46 $\pm$ 0.02 ^c	3.27 $\pm$ 0.10 ^a	3.18 $\pm$ 0.12 ^{ab}	2.94 $\pm$ 0.03 ^b
5 th	2.62 $\pm$ 0.09 ^b	3.29 $\pm$ 0.14 ^a	3.23 $\pm$ 0.17 ^a	2.93 $\pm$ 0.05 ^{ab}
6 th	2.64 $\pm$ 0.08 ^b	3.02 $\pm$ 0.06 ^a	2.95 $\pm$ 0.14 ^{ab}	2.80 $\pm$ 0.07 ^{ab}
7 th	2.64 $\pm$ 0.08	2.86 $\pm$ 0.10	2.89 $\pm$ 0.09	2.75 $\pm$ 0.04
8 th	2.70 $\pm$ 0.04	2.96 $\pm$ 0.11	2.95 $\pm$ 0.09	2.85 $\pm$ 0.03
9 th	2.86 $\pm$ 0.03	3.03 $\pm$ 0.09	3.02 $\pm$ 0.08	2.93 $\pm$ 0.03
10 th	2.98 $\pm$ 0.04	3.08 $\pm$ 0.09	3.05 $\pm$ 0.08	3.02 $\pm$ 0.04

spectively, which differed non-significantly from each other. The mean cumulative FCR of cockerels of T₁ (Control) group at all the weekly intervals was lower (Significantly lower up to 6th weeks period) than other groups indicating that, supplementation of feed additives increases the FCR of cockerel birds. Similar to the present findings, feed conversion ratio non significantly to probiotics supplementation in three weeks old black (Bovan Nera) and white (Gold live) cockerels found by Ahmed and Abbas [12]. Trishna et al. [13] found on broiler birds fed high energy diet (3050 kcal/kg) with 0.4% Methionine had no difference in feed conversion ratio between the different groups. Ramesh and Chandrasekran [14] also reported feed conversion ratio were not affected by supplementation of exogenous enzymes either too high or low fiber diet in broiler chicks. Similar observations were reported by Elagib and Elzubeir [15] and Das et al. [16].

The mean performance index for T₁, T₂, T₃ and T₄ group observed 31.16 ± 0.44 , 29.50 ± 0.99 , 29.99 ± 1.45 and $30.58 \pm 0.55\%$ respectively, which were statistically non-significant from each other. The cost benefit analysis for T₁ (Control) group was highest (1.43) followed by T₄ group (1.40), T₂ group (1.36) and T₃ group (1.12) indicating economical superiority of the control group. The net profit in T₁ group (Rs 22.46) was highest followed by T₄ (Rs 21.52), T₂ (Rs 19.38) and T₃ (Rs 7.91) groups respectively. The study clearly indicates that supplementation of Ambiplex, Protexin and Metazyme feed supplements throughout the finisher period (6—10 weeks) may not be recommended. However they may be recommended during starter

(0—5 weeks) period to restore feed consumption during stressful condition in cockerel birds, which will yield best economical results to the poultry farmers.

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