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EFFECT OF FEED ADDITIVES ON THE PERFORMANCE OF BROILERS

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ABSTRACT

Feeding trial was conducted in order to study the response of broilers to the different feed additives in combination with one another in order to know which combination of feed additives would give better response. The criteria of response included body weight gain, feed consumption, feed efficiency, cost of feed per kg, body weight gain and mortality. In the experiment Driselase, Biovin-40, N-Fac - 1000, Furatin, Albac, and TM-200 were used at the recommended levels in different combinations in treatments. While treatment No.10 was used as control. The results indicated that Albac in combination with TM-200 gave the better performance.

Keywords: broilers, growth performance, feed additives, body weight, mortality, cost.

INTRODUCTION

As a primary source of animal protein, the poultry sector offers a valuable repository to bridge the gap between demand and the availability of balanced nutrition. In the last two decades poultry industry has played an important role in meeting the shortage of animal protein through the increased availability of eggs and meat in Pakistan. Poultry production, particularly broiler production is the quickest way to increase the availability of high quality protein for human consumption. Since the feed cost alone contributes to about 70-75% of the total cost of production, economically poultry production is, therefore, possible only when the feed cost is reduced & efficiency of feed utilization is increased (Qureshi, 1991).

The production of low quality feed has created variety of problems for the broiler industry resulting in poor performance and lower returns. Some valuable nutrients in feed are wasted because the birds are not able to utilize them. This may be due to several reasons like lack of digestive enzymes, insufficient time for digestive activity, sub clinical infection and inadequate processing of feed ingredients (Kemin, 1991).

To achieve a profitable balance among the cost of feed, the broiler performance, and quality of product, certain additives; are available in the market for use in broiler ration. Some of these additives are recommended for chemotherapeutic and prophylactic purposes while others are reputed for the growth promoting effect. Claims have also been made by manufacturers for numerous others benefits like improved feed efficiency, more meat, dry droppings and effective defense against diseases and enhanced acceptability of the product.

The present study was therefore, planned to investigate the effect of six commonly available commercial feed additives on the performance of the broilers with the following objectives.

a) To study the performance of broiler chicks in response to different commercial feed additives.
b) To verify the claims of the manufacturers regarding the desirable effects of these additives in broiler ration under local conditions.
c) To study the economics of adding the feed additives in broiler ration.
d) To recommend suitable feed additive for use in broiler ration.

MATERIALS AND METHODS

This research study was planned to investigate the effect of six commonly available commercial feed additives on the performance of broilers. This feeding trail was conducted at the poultry farm N.W.F.P Agricultural University, Peshawar.

The following treatments were included in the experiment.

a) Basal + TM-200 + Biovin-40
b) Basal +TM-200 + Albac
c) Basal +TM-200 + Driselase
d) Basal +Furatin + Biovin-40
e) Basal +Furatin + Albac
f) Basal +Furatin + Driselase
g) Basal +N-Fac-1000. + Biovin-40
h) Basal +N-Fac-1000 + Albac
i) Basal +N-Fac-1000 + Driselase
j) Basal Ration (control)

Table-1. Feed additives used in the present study.

Additives	**Quantity/ton of feed** (gm)	**Description**
Driselase	2000	Enzyme preparation
Biovin-40	250	Nitrovin 4% non antibiotic
N-ac-l000	1000	Growth promoter steptomycin, fish meal and whey factors
Furatin	1000	Furazolidone
Albac	250	Zinc Bacitracin 10%
TM-200	2280	Oxytetracycline 20%

Five hundred commercial broiler day old chicks were purchased from a commercial hatchery. Soon after their delivery at the farm 300 chicks were selected and divided into 30 groups in such a way that overall starting weight and weight range were similar for each group of chicks, allotted to individual pen having the floor area of 1 m x 1 m.

Each pen was furnished with a feeder, a drinker, and an electric bulb (l00watts) with reflecting cover to serve as heat source. Saw dust seven cm thick was spread over the floor in each pen to serve as litter. These entire pens were maintained in the same shed under uniform environmental conditions. The temperature under the bulb in the individual pen was maintained at about 95F in the first week of experimental period and was reduced by 5 degree each week in the subsequent weeks with the help of increasing the distance of the bulb, hanging over the floor, uniformly in all pens.

The 30 groups were randomly assigned to ten experimental treatments, including the control treatment, in such a way that each treatment was replicated three times with 10 chicks per replicate. The feed and water were supplied at Libitum throughout the experimental period. Record of the daily feed offered and of the left over feed after each week was maintained to calculate the weekly feed consumption of each replicate. Body weight of the chicks at the end of each week and the final body weight data were recorded for each replicate after three hours of fasting. The birds were vaccinated at 7 day (intraocularly) and day 22 with N.D.V. (Mukhteswar strain) and at day 12 and day 28 with 1.B.D. vaccine.

Identical management conditions were provided to all the groups throughout the experimental period of five weeks in order to minimize the experimental errors. A representative sample was taken from the basal ration in a plastic bag for conducting proximate analysis (AOAC 1988).

Table-2. The results of proximate analysis of the basal ration.

	Sample 1	Sample 2	Average
Moisture %	11.59	11.28	11.43
Ash %	8.66	8.26	8.46
Crude protein %	25.69	25.12	25.45
Crude fiber %	4.82	4.49	4.65
Ether extract	4.51	4.62	4.56
Nitrogen free extract %	49.63	46.23	45.45

RESULTS AND DISCUSSIONS

The feeding trial was conducted in order to study the response of broilers to different feed additives. The criteria of response included body weight gain, feed efficiency, feed consumption, cost of feed per kg body weight gain and mortality. The results obtained are presented as follows:

Body weight gain

The body weight gain data have been presented in Table-3. The mean weight gain at the end of 5-week experiment was 674, 708, 673, 690, 667, 606, 702, 694, 697, and 596 grams for treatments 1 to 10, respectively. As evident maximum weight gain was obtained in response to treatment 2 (TM-200+Albac) followed by treatment seven (N-Fac1000+Biovin-40) and treatment nine (N-Fac-l000+Driselase). In spite of the apparent differences in weight gain data when subjected to statistical analysis revealed no significant differences.

Similar observations were made by Grafin (l982) who observed maximum weight gain in response to the addition of penicillin, Zinc Bacitracin, and Biovin-40. In their study the body weight gain was more than the control when feed additives were used in the ration but the superiority of individual feed additive varied with feeding period.

Feed consumption

The average feed consumption per chick during the 5 week experimental period was 1399, 1422, 1426, 1473, 1392, 1532, 1476, 1500, 1467 and 1502 grams for treatments 1 to 10, respectively, the highest feed consumption was recorded in treatment 6 (Furatin+Driselase), yet the weight gain was lowest except the control group showing the least utilization of feed. The lowest feed consumption was recorded in treatment 5 (Furatin+Albac) in case of treatment 5, the feed consumption was lowest but the weight gain was significant enough to give the best utilization of feed. These findings did not differ when statistically analyzed. The feed consumption data for the ten experimental rations is presented in Table-4.

Feed efficiency (feed/gain)

The mean feed efficiency was 2.07, 2.00, 2.12, 2.13, 2.08, 2.53, 2.10, 2.16, 2.10 and 2.52 for treatments 1, 2, 3,4,5,6,7,8,9 and 10, respectively. Treatment 2 (TM-200+albac) has the best feed conversion ratio than all other treatments. The lowest feed efficiency was recorded in response to control group (treatment 10). However the feed efficiency data when subjected to statistical analysis, revealed no significant differences. The average feed efficiency for each of the ten experimental treatments is presented in Table-5.

Economics of experimental rations

The cost of feed/kg body weight gain was calculated for each of ten experimental rations. The cost Table-6, column 5, 27.92, 28.44, 28.52, 29.46, 27.84, 30.64, 29.52, 30, 29.52 and 30.04 rupees for treatments 1,2,3,4,5,6,7,8,9 and 10 respectively. As indicated from these Figures Albac+TM200 (Treatment 2) proved to be the most economical feed additive, followed by that having N-Fac-1000+biovin-40 (treatment 7) the ration

having no feed additive (treatment 10) was found to be the most uneconomical.

Mortality

Mortality rate of chicks in the ten experimental groups was 4, 4, 3, 2, 2, 3, 2, 2, 5 and 2 for treatments 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10, respectively in Table-6, column 6. The main cause of mortality was sudden death with birds showing no postmortem lesions. The next most important cause of death was accumulation of fluid in the abdominal cavity.

Over all performance

Considering all the parameters of response including weight gain, feed consumption, feed efficiency, cost of feed/unit weight gain and mortality as shown in Table-6, the use of Albac in combination with TM-200 as feed additive was most effective and gave best performance. Workers like Marusich *et al*., (1974) and Haq *et al*., (1991) have shown improvement as a result of adding Terramycin in poultry feed. Arakwa and Ohe (1975) and Stutz *et al*., (1983) have indicated the effects of Albac as feed additive in broiler ration. In the study Albac and TM-200 added together in the broiler ration was found to give the over all best performance.

Table-3. Body weight and weight gain data.

S. No.	Treatment	Replicate	Avg. body wt/chick (g)	Avg. body wt/chick (g)	Avg. wt gain/chick/treat
1	TM-200 +Biovin-40	IRI I R2 1R3	729 685 715	693 649 679	674
2	TM-200 +Albac	2R1 2R2 2R3	736 774 722	700 738 686	708
3	TM-200+Driselase	3R1 3R2 3R3	717 767 644	681 731 608	673
4	Furatin+Biovin-40	4R1 4R2 4R3	772 668 739	736 632 703	690
5	Furatin +Albac	5R1 5R2 5R3	689 739 680	653 703 644	667
6	Furatin+Driselase	6k1 6R2 6R3	656 615 655	620 579 619	606
7	N-Fac-1000+Albac	7R1 7R2 7R3	737 737 740	701 701 704	702
8	N.Fac-l000 +Albac	8R1 8R2 8R3	724 777 690	688 741 654	694
9	N-Fac-000+Driselase	9R1 9R2 9R3	758 683 758	722 647 722	697
10	Control	10RI 10R2 10R3	650 614 631	614 578 595	596

Table-4. Average feed consumption data.

S. No.	Treatment	Replicate	Avg. feed cons/chick/rep (g)	Avg. feed con/chick/treat (g)
1	TM200+Biovin-40	1R1 1R2 1R3	1403 1321 1472	1399
2	TM-200+Albac	2R1 2R2 2R3	1328 1477 1460	1422
3	TM-200+Driselase	3R1 3R2 3R3	1345 1565 1368	1426
4	Furatin+Biovin-40	4R1 4R2 4R3	1400 1379 1641	1473
5	Furatin+ Albac	5R1 5R2 5R3	1270 1521 1385	1392
6	Furatin+Drisclase	6R1 6R2 6R3	1300 1748 1548	1532
7	N-Fac-1000+Biovin-40	7R1 7R2 7R3	1360 1446 1623	1476
8	N-Fac-1000+Albac	8R1 822 8R3	1762 1430 1308	1500
9	N-Fac-1000+Driselase	9R1 9R2 9R3	1403 1470 1527	1467
10	Control	10RI 10R2 10R3	1586 1393 1528	1502

Table-5. Average feed efficiency data.

S. No.	Treatment	Replicate	Avg. feed/chick/ rep (g),	Avg. wt gain/chic k/rep	Avg. feed effic/rep	Avg. Feed effic /treat
1	TM-200+Biovin-40	1R1 1R2 1R3	1403 1321 1472	693 649 679	2.02 2.03 2.16	2.07
2	TM-200 +Albac	2R1 2R2 2R3	1328 1477 1467	700 738 686	1.89 2.00 2.12	2.00
3	TM-200+Drisclase	3R1 3R2 3R3	1345 1565 1368	681 731 608	1.97 2.14 2.25	2.12
4	Furatin+Biovin-40	4R1 4R2 4R3	1400 1379 1641	736 632 703	1.90 2.18 2.33	2.13
5	Furatin+Albac	5RI 5R2 5R3	1270 1521 1385	653 703 644	1.94 2.16 2.15	2.08
6	Furatin+Driselase	6R1 6R2 6R.3	1300 1748 1548	620 579 619	2.09 3.01 2.50	2.53
7	N-F-1000+Biovin-40	7R1 7R2 7R3	1360 1446 1623	701 701 701	1.94 1.06 2.30	2.10
8	N-Fac-1000+Albac	8R1 8R2 8R3	1762 1430 1308	688 741 654	2.56. 1.92 2.00	2.16
9	N-Fac-000+Driselase	9R1 9R2 9R3	1403 1470 1527	722. 647 772	1.94 2.27 2.11	2.10
10	Control	10R1 10R2 10R3	1586 1393 1528	614 578 595	2.58 2.41 2.56	2.52

Table-6. Overall performance of different feed additives.

S. No.	Treatment	Avg. feed con/chick/tr eat (g)	Avg. wt. gain/chick /treat (g)	Avg. feed effic/ chick/treat	Cost of feed/kg wt gain (Rs.)	Mortality
1	TM-200+Biovin-40	1399	674	2.07	27.92	4
2	TM-200 +Albac	1422	708	2.00	28.44	4
3	TM-200+Drisclase	1426	673	2.12	28.52	3
4	Furatin+Biovin-40	1473	690	2.13	29.46	2
5	Furatin+Albac	1392	667	2.08	27.84	2
6	Furatin+Driselase	1532	606	2.53	30.64	3
7	N-F-1000+Biovin-40	1476	702	2.10	29.52	2
8	N-Fac-1000+Albac	1500	694	2.16	30	2
9	N-Fac-1000+Driselase	1476	696	2.10	29.52	5
10	Control	1502	596	2.52	30.04	2

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