EFFECT OF FEEDING OF BAKERY WASTE ON PERFORMANCE OF BROILER CHICKS IN HOT ARID ZONE OF RAJASTHAN[#]

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ABSTRACT

Forty unsexed day-old, commercial broiler chicks were purchased from Sandhu Poultry farm, Bikaner. These chicks were weighed individually and uniformly distributed as 20 chicks in two groups. Each group was divided into two replicates with 10 chicks in each. The birds were offered feed and water *ad libitum*. The chicks were fed with starter mash which contained crude protein 22.03% and metabolizable energy 2910.70 Kcal/kg up to 3 weeks of age. For next 3 weeks i.e. from 4 to 6 weeks of age with finisher mash which contained crude protein 20.14% and metabolizable energy 3009.01 Kcal/kg. Group T_1 (control group) was fed standard broiler mash. In group T_2 maize was replaced by bakery waste at 20% level in feed. Growth, feed consumption and feed conversion ratio of broilers in group T_2 (basal diet + bakery waste at 20 % level in feed) was significantly higher than that recorded on control diet. Present study suggested that supplementation of bakery waste was effective in improving performance in broiler chickens.

***Key words*:** Bakery waste, broiler, performance, feed conversion ratio

Introduction

The poultry industry in the country has grown rapidly because of its early assured returns, short generation interval and limited land requirements. Today, it is a highly specialized, complex competitive business, characterized by phenomenal growth and has become one of the fastest growing segment of the animal science industry in India

Bakery waste, a by-product of wheat processing industry have been identified as a promising feed resource for their use in the ration of poultry and can be used as a energy source as it has about 12% C.P., 0.65% C.F. and 4.2 M Cal/kg. D.E (Waldroup *et al.*, 1982 and Gonzalez *et al.*, 1982). The availability of biomass is also quite appreciable at present and is expected to increase further as is indicated by the flourishing of the bakery industry. Considering this, a study on utilization of bakery wastes in the poultry ration as an energy supplement to replace high priced energy source like maize is planned.

Though, the efforts made regarding the utilization of non conventional feed resources in poultry ration can definitely help us to relieve the situation to some extent but for efficient utilization of alternative feed ingredients indicts as well as to maximize availability and utilization of available nutrients and to improve the growth and production performance of livestock and poultry for maximum profitability. These efforts are required to be combined with suitable feed technology and the use of appropriate feed additives in poultry feeding appears to be very promising and positive.

Keeping in view, the above facts, the present study was undertaken to study the effect of feeding multi-enzymes on broiler performance in arid zone of Rajasthan.

Materials and Methods

Forty unsexed day-old, commercial broiler chicks were purchased from Sandhu Poultry farm, Bikaner. These chicks were weighed individually and uniformly distributed into 2 treatment groups with 20 chicks in each group. Each group was divided into two replicates with 10 chicks in each. The birds were offered feed and water *ad libitum*. The chicks were fed with starter mash which contained crude protein 22.03% and metabolizable energy 2910.70 Kcal / kg up to three weeks of age. For next 3 weeks i.e. from 4 to 6 weeks of age with finisher mash which contained crude protein 20.14% and metabolizable energy 3009.01 Kcal/kg. Group T_1 (control group) was fed standard broiler mash. In group T_2 bakery waste at 20% level was added in basal diet. Adequate and identical floor, feeding and watering space were provided to chicks of both groups throughout the experiment. Earthen vessels were used to provide water. The detailed composition of the basal ration (both starter and finisher) used for feeding the chicks is presented in Table 1. The data obtained in this experiment were analyzed using conventional statistical procedure as suggested by Snedecor and Cochran (2004) and significance of mean differences was tested by Duncan's new multiple range test.

Results and Discussion

The parameters studied were average weekly live body weight, weekly gain in body weight, weekly feed consumption and feed conversion ratio.

Body weight

At first week of age, more mean b.wt. was observed in T_2 group (92.70 ± 1.41 g) as compared to T_1 group (91.55 ± 1.51 g). During second week of age, the mean body weight of chicks was higher in T_2 group (170.64 ± 3.50 g) than group T_1 (166.02 ± 2.93 g). The response of body weight in third week of age was similar to first two weeks i.e. the mean body weight of chicks of T_2 group (331.84 ± 8.81 g) was higher than control group T_1 (309.97 ± 8.34 g). At fourth week of age, significantly higher body weight was found in T_2 group (529.60 ± 14.07 g) than that was observed in control group T_1 (520.37 ± 14.34 g). At five weeks of age, same trend as that of week fourth was observed, the mean body weight of T_2 group (807.47 ± 22.54 g) differs significantly from control group T_1 (757.02 ± 19.45 g). Like week fourth and fifth the body weight at sixth week of age revealed significantly higher body weight in group T_2 (1144.89 ± 40.73 g) than that was found in control group T_1 (1071.13 ± 33.04 g). The results of study are in agreement

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with the reports of Rao *et al.* (2000), Hosamani *et al.* (2001).

Body weight gain

The means for body weight gain of broiler chicks at week first indicated that group T_2 chicks fed bakery waste had higher body weight gain (38.15 ± 1.37 g) than control group T_1 (37.45±1.74 g). The means for body weight gain of broiler chicks at week II was found to be more in T_2 group (78.07±4.03 g) than control group T_1 (74.43±3.39 g). Similarly, at week III, the mean body weight gain of chicks was significantly higher in group T_2 (161.21±8.87 g) as compared to control group T_1 (143.94±7.54 g). Likewise, at fourth, week of age significantly higher average body weight gain was attained by chicks of treatment T_2 group (197.76±14.12 g) in comparison to control group T_1 (207.37±16.31 g). At 5th week, on comparing the mean b.wt. gain of two groups it was found that group T_2 group (277.86 ± 24.76 g) attained significantly higher b.wt. gain than group T_1 (236.64±23.97 g). Week sixth followed the same pattern as that of groups II, III and IV. Significantly higher mean b.wt. gain was attained by chicks of T_2 group (337.42±38.28 g) than in control group T_1 (314.10±38.70 g). These finding are in accordance to that of Abdullatif *et al.* (2004) and Vaishnav (2009).

Feed consumption

During 1st week, average feed consumption by the broiler chicks in control group T_1 (83.63± 9.80 g) was less than that in T_2 group (77.44 ± 5.16 g). During week 2nd , higher feed intake was observed in control group T_2 (153.42±8.23 g) as compared to group T_1 (151.10±9.04 g). The mean feed consumption during week III of the experiment was recorded to be significantly higher in group T_2 (324.43±16.00 g) than in control group T_1 (313.08±19.45 g). During week fourth, the average feed consumption was found to be significantly higher in group T_2 (395.52±24.25 g) as compared to group T_1 (435.49 ± 36.62 g). Mean feed intake during week fifth revealed that the feed consumption in group T_2 (552.99±16.53 g) was higher than in group T_1 (483.35± 73.22 g). The mean feed consumption during week sixth of the experiment was recorded to be significantly higher in group T_2 (704.54 ± 82.49 g) in comparison to control group T_1 (648.63±73.27 g). The overall feed consumption throughout the experimental period (first to sixth weeks) revealed that feed intake was statistically higher for group T_2 (2199.49±99.83 g) than control group T_1 (2145.14± 133.78 g). These finding are in accordance to Abdullatif *et al.* (2004), Gujrathi (2009) who observed improved effect of multi-enzymes on feed intake of broiler chicks.

Feed conversion ratio

The effect of multi enzyme on feed conversion ratio was found to be significant ($P \leq 0.01$) at the overall level (1st to 6th weeks). The means feed conversion ratio at the starter phase (I-III weeks) was significantly better in T_2 group (1.98±0.07) than control group T_1 (2.13±0.03). The feed conversion efficiency at this stage revealed that bakery waste helped in efficient utilization of feed which resulted in significantly lower feed conversion ratio over control. At finisher phase (week fourth-sixth) the mean feed conversion ratio was better for group T_2 (2.03±0.04) than control group T_1 (2.06±0.02). The overall feed conversion efficiency (week first to sixth) showed almost similar trend to that of starter and finisher phase, in which best feed conversion efficiency was observed in T_2 group (2.01± 0.05) in comparison to control group T_1 (2.08 ± 0.02). The results of significantly better feed conversion ratio due to incorporation of bakery waste are similar to those of, Abdullatif *et al.* (2004) and Afzalzadeh *et al.* (2007) who reported that feed conversion ratio was significantly affected by bakery waste supplementation.

Table 1: Composition of basal ration fed to the chicks

Ingredient	Starter Ration (Parts per 100)	Finisher Ration (Parts per 100)
Maize	36	44
Bakery Waste	-	-
Rice polish	25	22.5
Ground nut cake	27	24.5
Fish Meal	09	6
Mineral Mixture	2	2
Ground nut oil	1	1
Total	100	100
C P (%)	22.03	20.14
Energy (Kcal/Kg)	2910.70	3009.01

Table 2: Means with respective standard errors for body weight (g) and body weight gain (g) at different weeks of age

Treatment	Age in weeks					
Body weight	I	II	III	IV	V	VI
T1	91.55 ±1.51	166.02 ±2.93	309.97 ±8.34	520.37 ±14.34	757.02 ±19.45	1071.13 ±33.04
T2	92.70 ±1.41	170.64 ±3.50	331.84 ±8.81	529.60 ±14.07	807.47 ±22.54	1144.89 ±40.73
Body weight gain						
T1	37.45 ±1.74	74.43 ±3.39	143.94 ±7.54	207.37 ±16.31	236.64 ±23.97	314.10 ±38.70
T2	38.15 ±1.37	78.07 ±4.03	161.21 ±8.87	197.76 ±14.12	277.86 ±24.76	337.42 ±38.28

Table 3: Means with respective standard errors for feed consumption (g) at different weeks

Treatment	Age in Weeks						
Feed Consumption	I	II	III	IV	V	VI	I-VI
T1	83.63 ±9.80	151.10 ±9.04	313.08 ±19.45	435.49 ±36.62	483.35 ±73.22	648.63 ±73.27	2145.14 ±135.78
T2	77.44 ±5.16	153.42 ±8.23	324.43 ±16.00	395.52 ±24.25	552.9 ±16.5	704.54 ±82.49	2199.49 ±99.83

Table 4: Mean feed conversion ratio with respective standard errors at I-III, IV-VI and I-VI weeks

Treatment	Age in weeks		
Feed conversion ratio	I –III	IV-VI	I-VI
T1	2.13 ± 0.03	2.06 ± 0.02	2.08^{C} ± 0.02
T2	1.98 ± 0.07	2.03 ± 0.04	2.01^{D} ± 0.05

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