

## COMPARATIVE EFFICIENCY OF DIFFERENT FEED ADDITIVES ON THE PERFORMANCE OF QUAIL CHICKS

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Quail chicks, 240 days old (of mixed sex), were randomly divided into 4 groups having 3 replicates in each, and given four feeds i.e. with no additive, supplemented with zinc bacitracin only, zinc bacitracin + rumen meal and zinc bacitracin + dried brewer's yeast, for 42 days to determine the effect of feed additives on the growth. During experimental period, weight gain, feed efficiency and dressing percentage were recorded. Results indicated that supplementation of feed with zinc bacitracin + rumen meal and zinc bacitracin + dried brewer's yeast significantly improved weight gain. Feed consumption and feed efficiency ratio among various groups showed non-significant differences.

**Key words:** Feed additives, Quail, Zinc bacitracin.

### Introduction

Major population of Pakistan is deficient in animal protein (Qureshi 1984). The poultry meat and eggs provide a realistic way to meet the shortage of animal protein (Economic Survey 2000; Khan 1983). However, still there is a need to explore new resources of animal protein to solve the deficiency problem. Quail meat was available from the forests only in the past. Now this meat can be procured from the market. Quails are less expensive and take a comparatively short time to reach maturity. Now-a-days quail hatcheries have been established in big cities, but a major constraint in the development of this industry is the non-availability of efficient feeds. By the use of additives, efficiency of feeds can be improved. The purpose of the introduction of additives to feed is to improve the efficiency of nutrients like protein, fat and carbohydrates and to enhance profitability. Zinc bacitracin is reported to be beneficial for growth of poultry (Fernandez *et al* 1973; Tesarova *et al* 1974; Johnson and Arscott 1974). Rumen meal contains digestive enzymes which help in the metabolism of protein. Dried-brewer yeast is reported to be helpful in the growth of animal and poultry (Choudhry *et al* 1995). In the light of above reported facts this project was undertaken to determine the effect of different feed additives on the performance of quail.

### Materials and Methods

Two hundred and forty (day old) quail chicks were procured from a local hatchery and randomly divided into four experimental groups having 60 quails in each. These four groups

were further sub divided into three experimental units having 20 quail chicks in each. Experimental room was partitioned into 12 experimental compartments of 2'×3' size. Before the start of experiment room was cleaned, white washed and disinfected. Fresh, clean water and feeds were offered *ad-libitum*. Wood shaving was used as bedding material. Temperature of the experimental room was maintained at 37°C at the start of experiment and later on maintained at 35°, 33°, and 30°C during second, third and the remaining experimental period. Electric light was provided 24 h throughout the experiment.

Four experimental feeds were formulated, mixed and designated as A, B, C, and D (Table 1). Feed A contained no additive, feed B contained zinc bacitracin (25 g 100 kg<sup>-1</sup> as recommended by Hilton Pharma Karachi Pakistan for increase in growth), feed C contained zinc bacitracin (25 g 100 kg<sup>-1</sup>) and rumen meal 250g 100 kg<sup>-1</sup>. Rumen meal was prepared from the rumen of buffalo, eviscerated, chopped and dried at 80°C in hot air oven. Feed D was supplemented with zinc bacitracin (25 g 100 kg<sup>-1</sup>) and dried brewer yeast (500 g 100 kg<sup>-1</sup>). All formulated feeds were isocaloric and isonitrogenous. Experimental feeds were analyzed for protein, fat, fiber, ash and nitrogen free extract according to the standard methods (A.O.A.C. 1984).

Following parameters were observed during the experimental period i.e. initial weight/chick (g), final weight/chick (g), feed consumption/chick, feed efficiency (calculated by feed required/unit weight gain); dressing percentage was calculated after removing feathers, skin, intestine and internal organs.

Data collected were subjected to analysis of variance (Steel and Torrie 1980).

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## Results and Discussion

Proximate composition of experimental feeds is presented in Table 2. Rumen meal analyses showed dry matter 91%, protein 59%, ether extract 10.80%, ash contents 5% and nitrogen free extract 16.20%, while dried brewer yeast showed dry matter 90%, protein 39%, ether extract 1.80%, ash 7.20% and nitrogen free extract 42% (Table 2).

Average weight gained by the quail chicks fed on different experimental feeds, indicated that quail chicks maintained on feeds containing zinc bacitracin + rumen meal (C) and zinc bacitracin + dried brewer yeast (D) gained more weight  $P < 0.05$  than quails given feed containing no additive and feed containing zinc bacitracin only. Improvement in weight gain may be due to the rumen meal and dried brewer yeast. Rumen meal has digestive enzymes, which help in the metabolism of

nutrients. These findings are in agreement with Ali *et al* (1995) who reported that additives improved weight gain. Rajic *et al* (1987) and Chouhan (1994) had also reported an increase in weight gain of chicks with dried brewer yeast. Similar observation have been recorded by other researchers (Flores *et al* 1993; Succi *et al* 1980; Zwatanov 1986; Choudhry *et al* 1995).

Feed in-take data indicated that more feed was consumed when rumen meal + zinc bacitracin and zinc bacitracin + dried brewer yeast were added in the feed. It is obvious from these results that incorporation of rumen meal and dried brewer yeast has no adverse effect on the feed intake.

Feed efficiency values of different experimental rations indicated that addition of rumen meal + dried brewer yeast improved feed efficiency (Table 3). These findings are in agree-

**Table 1**  
Composition of experimental rations

Ingredients	Rations			
	A	B	C	D
Maize	30.00	30.00	30.00	30.00
Wheat waste	20.00	20.00	20.00	20.00
Rice broken	2.00	2.00	2.00	2.00
Rice polishing	8.00	8.00	8.00	8.00
Cotton seed meal	4.00	4.00	4.00	4.00
Sunflower meal	2.00	2.00	2.00	2.00
Corn gluten meal	4.00	4.00	4.00	4.00
Soybean meal	13.00	13.00	13.00	13.00
Poultry meal	2.00	2.00	2.00	2.00
D.C.P.	0.500	0.500	0.500	0.500
Canola meal	7.00	7.00	7.00	7.00
Fish meal	4.00	4.00	4.00	4.00
Molasses (cane)	2.50	2.47	2.225	1.975
Limestone	0.50	0.50	0.50	0.50
Vitamins & minerals	0.50	0.50	0.50	0.50
Zinc bacitracin	-	0.025	0.025	0.025
Rumen meal	-	-	0.250	-
Dried brewer yeast	-	-	-	0.500
Total	100.00	100.00	100.00	100.00

**Table 3**  
Effect of experimental feeds on weight gain, feed efficiency etc of quail chicks

Description	Group			
	A	B	C	D
Number of chicks	60	60	60	60
Duration of experiment (days)	42	42	42	42
Weight of quail chicks at the start (g/chick)	7.50	7.50	7.50	7.50
Weight of quail chicks at the end (g/chick)	139.00	140.00	150.00	149.00
Average weight gained (g/chick)	131.00 <sup>NS</sup>	132.00 <sup>NS</sup>	142.00*	141.00
Feed consumption (g/chick)	537.00 <sup>NS</sup>	575.00 <sup>NS</sup>	585.00 <sup>NS</sup>	586.00 <sup>NS</sup>
Feed efficiency ratio	4.37	4.35	4.11	4.15
Dressing (%)	57.00	57.00	58.00	56.00
Heart (g)	4.50	4.50	4.55	4.10
Liver (g)	7.00	7.50	7.50	7.25
Gizzard (g)	6.50	7.25	6.50	6.50
Mortality (%)	5.00	7.00	8.00	7.00

\* Significant at  $< 0.05$ ; NS, non significant.

**Table 2**  
Chemical composition of rumen meal, dried brewer yeast and experimental feeds\*

Particulars	Rumen meal	Dried brewer yeast	Feed A	Feed B	Feed C	Feed D
	Protein (%)	59.00	39.00	21.64	21.50	21.70
Ether extract (%)	10.80	1.80	3.85	3.80	3.82	3.84
Ash (%)	5.00	7.20	6.50	6.00	6.25	6.40
Fibre(%)	-	-	4.00	4.10	4.10	4.00
Nitrogen free extract (%)	16.20	42.00	54.11	54.90	54.63	53.26
Dry matter (%)	91.00	90.00	90.00	90.00	90.00	90.00
**Metabolizable energy Kcal/Kg	-	-	2923	2923	2930	2935

\*Average of three readings; \*\*Calculated values.

ment with Rajic *et al* (1987) and Succi *et al* (1980) who reported that feed efficiency values were improved as the level of dried brewer yeast was increased.

It was also observed that incorporation of feed additives had no adverse effect on the dressing percentage and weight of internal organs. It may be concluded from the results (Table 3) that addition of zinc bacitracin with rumen meal or dried brewer yeast improved feed efficiency, dressing percentage and weight of quail chicks, while no adverse effect on the growth performance of quail chicks was observed.

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