

## EFFECT OF BLOOD MEAL ON THE GROWTH AND CARCASS YIELD OF BROILERS

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### ABSTRACT

An experiment was conducted to study the effect of four levels of blood meal on the growth and carcass yield of broilers. For this purpose, 250 day-old chicks were divided in five groups i.e., A, B, C, D and E. 0, 3, 4, 5 and 6 percent levels of blood meal were mixed in the ration of the five groups respectively. The chicks were reared on the experimental rations for six weeks and data on feed consumption, weight gain, feed conversion ratio and dressing percentage were recorded. Results revealed highly significant differences ( $P < 0.01$ ) among weight gain of broilers. Average weight gain of birds of groups A, B, C, D and E was 1634.66, 1866.55, 1808.04, 1792.07 and 1755.34 g respectively. The group B (3% blood meal) gave best performance in terms of weight gain and carcass yield as compared to all the other groups. Average feed consumption of broilers of five groups was 4033.19, 3960.45, 4127.25, 4147.19 and 4149.19 g. Group B consumed less feed. The average feed conversion ratio was 2.47, 2.12, 2.28, 2.31 and 2.36. Better feed conversion ratio was observed in birds of group B. The average dressing percentage of broiler chicks of five groups was 56.23, 63.41, 61.43, 60.38 and 57.74 percent. The broiler of group B showed better dressing percentage (63.41). Non-significant differences were observed in weight of edible parts like liver, gizzard and heart. It was concluded that the broilers could be reared economically by using 3% of blood level as an animal protein source in the broiler ration to save economy of producers.

**Keywords:** Blood meal, broilers, growth, carcass yield

### INTRODUCTION

Animal protein supplements are the only source rich in all the essential amino acids (Fisher, 1968). Blood meal supplementation is a rich source of protein. It is quite high in biological value as compared with vegetable protein supplements for poultry rations. Generally vegetable protein supplements are deficient in two of the essential amino acids which are lysine and methionine, whereas blood meal is rich in both of these amino acids, however it is deficient in isoleucine. Although protein is the most costly nutrient of poultry rations, but it is essential and should supply all the essential amino acids. Blood meal meets the requirements by two ways. Firstly it can meet the protein requirement of bird. Secondly it serves the deficiency of lysine. It contains about 800 g/Kg of protein and small amounts of ash and oil and about 100 g/Kg of water (Donald *et al.*, 1988). It is also one of the richest source of lysine, a rich source of arginine, methionine, cystine, leucine but is very poor in isoleucine and contains less glycine than fish or bone meal. Overall it is best regarded as a food for boosting dietary lysine level (Donald *et al.*, 1988). Blood meal contains 9.843% moisture, 8.726% ash, 1.980% salt, 72.02% curde protein, 1.360% crude fiber and 8.23%

lysine and is now being used as an animal protein in poultry ration in various proportions for better growth and carcass yield. Therefore, the present project was designed to evaluate five levels of blood meal for broiler rations.

### MATERIALS AND METHODS

The experiment was conducted at the Poultry Experimental Station, Department of Poultry Husbandry, Faculty of Animal Husbandry and Veterinary Science, Sindh Agriculture University, TandoJam. Two hundred and fifty day-old broiler (Hubbard) chicks were reared. The experiment continued for 6 weeks. All the chicks were weighed individually at the start of experiment and were randomly divided into five groups of 50 chicks each. The chicks were kept on deep litter system by using sawdust. The shed was white washed and disinfected thoroughly before the arrival of chicks. Feed ingredients used in the self-prepared ration were purchased from local market. Experimental starter and finisher rations were prepared on iso-nitrogenous and iso-energetic basis and designated as A, B, C, D and E (Tables 1 and 2). In each ration 0, 3, 4, 5 and 6 percent



of blood meal was mixed. The temperature of all the groups was maintained in such a way that it was 95°F in the 1st week and was reduced by 5°F every coming week. Continuous light was provided throughout the conduct of experiment. The birds were fed *ad libitum*. Fresh and clean water was also provided round the clock.

The following observations were recorded

Feed consumption

Weight gain

Feed conversion ratio

Slaughtering data

Per bird profit (Profit = income - expenditure).

At the end of experiment 10 birds from each group were randomly selected and slaughtered to study the required parameters. The data thus collected were statistically analyzed using analysis of variance technique (ANOVA) using MSTAT-C computer programme (Gomez and Gomez, 1984; William and George, 1978).

## RESULTS AND DISCUSSION

The feed consumed by the birds of groups A, B, C, D and E averaged 4033.19, 3960.45, 4127.25, 4147.19 and 4149.19 grams, respectively (Table 3). The minimum feed was consumed (3960.45 g) by group B while on the other hand maximum feed was consumed (4149.19 g) by group E. Statistical analysis of the data showed highly significant ( $P < 0.0$ ) difference among the groups. Further analysis showed that birds of the group B consumed less feed when compared to all other groups. These results are in close agreement with those of Naurantelli *et al.* (1987), who reported that less feed consumption was observed when birds were fed with 3% blood meal supplementation.

The average weight gained by the birds of groups A, B, C, D and E was 1634.66, 1866.55, 1808.04, 1792.07 and 1755.34 grams, respectively (Table-3). The highest weight gain (1866.55g) was observed in group "B", while lowest weight gain (1634.66g) was observed in group "A". The data when subjected to statistical analysis of variance (Table-3) showed highly significant ( $P < 0.01$ ) difference in weight gain among the groups. Further analysis revealed that the birds fed on ration B gained higher weight ( $P < 0.01$ ) than those birds fed on rations A, C, D or E. The differences among birds of latter four groups were non significant. These results are in agreement with those of Squibb and Braham (1995) and Toor and Ullah (1972), who reported that addition of blood meal resulted in significant improvement in growth rate and showed better weight gain.

The total feed conversion ratio for birds of groups A, B, C, D and E was 2.47, 2.12, 2.28, 2.31 and 2.36,

respectively (Table-3). The chicks fed on ration "B" were observed to be apparently more efficient in feed conversion per unit of weight gain. Where as chicks of groups A, C, D and E required comparatively more quantity of feed per unit weight gain. Best feed conversion ratio per unit weight gain was observed in group "B" (2.12) whereas, poor feed conversion ratio was noted in group "A" (2.47). The data when subjected to analysis of variance revealed highly significant ( $P < 0.01$ ) difference in feed efficiency values among chicks fed on different rations. The results also indicated that the birds on ration B were more efficient than the birds in the groups A, C, D and E. These results are in agreement with those of Naurantelli *et al.* (1987), who observed that significant differences were observed when birds were fed with different levels of blood meal.

The average values for dressing percentage of broilers were 56.23, 63.41, 61.43, 60.38 and 57.74 %, for groups A, B, C, D and E respectively (Table-3). The chicks fed on ration B showed better dressing percentage as compared to the broilers of groups A, C, D and E. The data when subjected to analysis of variance revealed highly significant ( $P < 0.01$ ) difference among the groups. These results are in agreement with those of Donald *et al.* (1988), who reported that best dressing percentage was recorded when 3% of blood meal was added in broiler ration.

The average weights of liver of broilers in groups A, B, C, D and E were 50.48, 49.71, 48.44, 49.67 and 49.50 grams, respectively. The average weights of gizzard of broilers in groups A, B, C, D and E were 40.70, 40.72, 40.80, 40.60 and 40.74 grams, respectively. The average weight of heart of broilers in groups A, B, C, D and E were 9.03, 9.35, 9.20, 9.00 and 9.14 grams, respectively (Table 3). The date when subjected to statistical analysis, non significant difference in the weight of liver, gizzard and heart of all groups of broilers were recorded. The per bird cost of different groups A, B, C, D and E averaged Rs. 66.38, 66.47, 68.39, 68.88 and 69.25, respectively (Table 4). The average per bird profit of groups A, B, C, D and E was Rs. 7.62, 17.70, 13.20, 12.03 and 10.18, respectively. The results indicated that the group B supplemented with 3% blood meal was more economical than other groups A, B, C, D and E. Group B was cheaper while group E was most expensive.

## CONCLUSION

It was concluded from the study that broilers can be reared economically on ration along with 3% blood meal as an animal protein source to get better profit with minimum cost of production. The self-prepared ration gives better growth rate and carcass yield and is economical for the producer.

Table 1: Composition of experimental starter rations (%)

Ingredients	Ration A	Ration B	Ration C	Ration D	Ration E
Rice broken	43.1	44.1	44.6	45.44	46.1
Rice Polish	8	8	8	8	8
Fish Meal	11	10	9.5	8.16	8
Blood Meal	0	3	4	5	6
Soybean Meal	5	1	0	0	0
Canola Meal	10	10	10	10	10
Animal protein concentration	3	3	3	3	3
Guar Meal	5	5	5	5	3
Limestone	0.10	0.10	0.10	0.10	0.10
Rice Bran	10	10	10	10	10
Sunflower Meal	4	5	5	4.5	5
Premix	0.80	0.80	0.80	0.80	0.80
Total	100	100	100	100	100
M.E. (kg/cal)	2856.64	2848.60	2850.20	2850.89	2852.16
Protein (%)	22.25	22.26	22.26	22.12	22.12
Fat (%)	4.36	4.22	4.16	3.99	3.91
Ash (%)	7.93	7.56	7.40	7.17	7.26
Calcium (%)	1.08	1.03	1.01	1.0	1.09
Phosphorus (%)	0.56	0.52	1.50	0.45	0.45
Lysine (%)	1.04	1.04	1.05	1.05	1.06
Methionine + Cystine %)	0.84	0.86	0.86	0.86	0.86
Tryptophan (%)	0.20	0.18	0.17	0.16	0.15
Linoleic acid (%)	0.35	0.34	0.33	0.33	0.31
Salt (%)	0.30	0.28	0.27	0.25	0.26

Table 2: Composition of experimental finisher rations (%)

Ingredients	Ration A	Ration B	Ration C	Ration D	Ration E
Rice broken	48.54	51.8	52.1	47.91	16.2
Rice Polish	7	8	8	5	6
Fish Meal	10.16	8.40	8.40	8	6.70
Blood Meal	0	3	4	5	6
Soybean Meal	5.50	0	0	0	0
Canola Meal	10	10	10	10	10
Animal protein concentration	3	3	3	3	3
Guar Meal	5.0	0.40	0	5	5
Limestone	0	10	0.40	0.26	0.60
Rice Bran	10	1.60	10	10	10
Sunflower Meal	0	1.60	3.30	5	5.70
Premix	0.80	0.80	0.80	0.80	0.80
Total	100	100	100	100	100
M.E. (kg/cal)	3049.60	3050.24	3049.68	3051.60	3027.26
Protein (%)	19.96	19.66	19.79	20.82	21.00
Fat (%)	4.06	3.9	3.84	2.89	2.74
Ash (%)	7.35	7	7.02	6.43	6.35
Calcium (%)	1.0	1.0	1.0	0.93	0.96
Phosphorus (%)	0.52	0.45	0.45	0.44	0.40
Lysine (%)	0.99	0.93	0.95	1.02	1.03
Methionine + Cystine %)	0.80	0.795	0.81	0.85	0.85
Tryptophan (%)	0.19	0.15	0.14	0.16	0.16
Linoleic acid (%)	0.32	0.29	0.27	0.29	0.29
Salt (%)	0.30	0.25	0.26	0.25	0.24



**Table 3: Effect of five levels of blood meal on feed consumption, weight gain, feed conversion ratio and slaughtering data of broilers**

Parameters	Group A	Group B	Group C	Group D	Group E
Feed consumption (g)	4033.19 c	3960.45 a	4127.25 b	4147.19 b	4149.19 b
Weight gain (g)	1634.66 b	1866.55 a	1808.04 a	1792.07 a	1755.19 a
F.C.R.	2.47 c	2.12 a	2.28 b	2.31 b	2.36 b
Dressing percentage	56.23 b	63.41 a	61.43 b	60.38 b	57.74 b
Wt. of edible parts					
Liver	50.48 a	49.71 a	48.44 a	49.67 a	49.50 a
Gizzard	40.70 a	40.72 a	40.80 a	40.60 a	40.74 a
Heart	09.03 a	09.35 a	09.20 a	09.00 a	09.14 a

Values with different letters for each parameter differ significantly ( $P < 0.01$ ).

**Table 4: Effect of five levels of blood meal on per bird profit of broilers**

Observations	Group A	Group B	Group C	Group D	Group E
Cost of feed (Rs.)	39.38	39.47	41.39	41.88	42.25
Cost of day old chick (Rs.)	20.00	20.00	20.00	20.00	20.00
Miscellaneous cost (Rs.)	7.00	7.00	7.00	7.00	7.00
Total expenditure (Rs.)	66.38	66.47	68.39	68.88	69.25
Total weight at 42 days (Kg)	1.682	1.913	1.85	1.839	1.803
Sale price/Kg live weight (Rs.)	44.00	44.00	44.00	44.00	44.00
Total Income per bird (Rs.)	74.00	84.17	81.61	80.91	79.33
Profit (Rs.)	7.62	17.70	13.20	12.03	10.08

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