

## EFFECT OF SUPPLEMENTED DIETARY PROTEIN ON CERTAIN HAEMATOLOGICAL VALUES AND MEAT YIELD CHARACTERISTICS OF BROILER BIRDS

M. S. Alam, N. Ahmad, M. A. Miah and R. Islam<sup>1</sup>

Department of Physiology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

### ABSTRACT

The effect of different levels of supplemented dietary protein on body weight, certain haematological values and meat yield characteristics in 20 "Shaver Star Bro" broilers was studied during the period from 02 March to 12 April 2002. The broilers were randomly assigned to four equal groups ( A to D ) each consisting of 5 birds. Group A was considered as control, fed only with commercial ration and other three groups were treated with extra dietary protein supplement @ 5%, 10% and 15% as group B, C and D respectively. Increased body weight was recorded in group B and the body weight decreases as the level of protein increased from 5% to 10% and 15% and the decrease was linear. No differences in haematological values were observed among the groups but the TEC varied significantly (  $p < 0.05$  ). The mean weight of breast meat, drum stick meat varied significantly (  $p < 0.01$  ). The shank weight varied significantly (  $p < 0.05$  ) but there was no significant difference among the mean weight of thigh meat and wing meat corresponding to the different levels of supplemented dietary protein. It can be concluded that 5% supplemented dietary protein with commercial ration gives better result in respect to body weight gain, haematological values and meat yield characteristics.

**Key words:** Dietary protein, haematological values, meat yield, broiler birds

### INTRODUCTION

Broiler industry is a rapidly changing enterprise among other poultry industry and successful broiler rearing depends on many factors, like availability of quality feed ingredients at a reasonable cost, proper management and quality chicks. Among these factors, feed itself constitutes about 65 to 70% of the total cost of production. The price of protein ingredient is comparatively higher than that of other ingredients i.e., protein cost involves about 15% of the total feed cost ( Banerjee, 1992 and Singh 1990 ). From the economic point of view, the poultry should be supplied with cheaper feed to get maximum return with minimum cost. The recent trend among the poultry nutritionists to explore the possibilities of using different protein concentrates to reduce the cost of poultry feed. Now a days, most of the poultry farmers have been using different protein concentrates in poultry diets as replacement of fish meal. Haematological parameters and its knowledge can be used to assess the health status of broiler chicks. The requirement of dietary protein depends on species, age and breed. It is necessary to evaluate the growth performance of broilers by using different protein concentrate. Researches have been done in broiler chicks supplying additional protein and growth performance but haematological studies in this aspect are very limited in Bangladesh condition. For this aspect this experiment was undertaken to assess the effect of protein supplementation on growth performance, meat yield characteristics and haematological parameters ( TEC, ESR, PCV, Hb, DLC ) of broiler birds.

### MATERIALS AND METHODS

A total of 20 "Shaver Starbro" broiler chicks were used to find out the effect of different dietary levels of protein on growth, meat yield and haematology. For this purpose, day-old chicks were purchased from local market of Mymensingh on 2 March 2002 and the birds were reared throughout the entire period of study upto 12 April 2002 in the well ventilated, well protected condition. The broiler chicks were fed with standard commercial ration ( Quality Feed Ltd., Dhaka, Bangladesh ). At the age of 23, these experimental birds were randomly divided into four equal groups ( A to D ) each consisting of 5 birds. Group A considered as control group fed with commercial ration and other groups were treated with supplemented protein ( Jasoprot protein concentration 60%, Jayson Agrovet Ltd. ) @ 5% ( group B ), 10% ( group C ) and 15% ( group D ) with commercial feed for next 21 days. Initial body weight of each bird was recorded prior to experiment and also recorded at 7 days interval up to the end of experimentation. These experimental broiler birds were maintained by standard management practices. In order to prevent stress, shock, deficiencies and infections, vitamin-mineral premix and antibiotic were used as per recommendation of manufacturer. Each of the birds of all four groups was also immunized against Gumboro and Ranikhet disease ( BCRDV<sup>®</sup> on day 5 & 18, Nobilis<sup>®</sup> Gumboro D-78 on day 11 & 21 ). At the end of the experiment the birds were sacrificed to collect blood sample and different meat yield characteristics. The haematological studies were performed within two hours of blood collection according to the method described by Lamberg and Rothstein (1977).

Present address: <sup>1</sup>Department of Physiology, Pharmacology and Biochemistry, Dinajpur Government Veterinary College, Dinajpur.

To study the meat yield characteristic the birds were dissected according to the procedure of Jones *et al.* (1979). Breast meat with keel bone, thigh meat with thigh bone, drumstick meat with drumstick bone, wing meat with wing bone and bread shank were separated, and were weighed by electrical weight machine and were expressed in percent of the live weight.

Data were analyzed statistically to find out significant difference. A randomized complete block design with more than one observation per cell is applied. Least significant difference (LSD), F-test and Student's 't'-test were done according to the procedure as described by Steel and Torrie (1980).

## RESULTS AND DISCUSSION

### Effect on body weight

The mean body weights of broiler chicks in different groups are presented in Table 1. It has been observed that the average weight gain increased as the level of protein supplementation increased from control diet to treatment group B (5% supplemented protein) and therefore decrease linearly with increasing dietary protein. It indicates that very high concentration of protein in diet is of no use and may have excreted through urine. These findings are similar to that of Zaghini and Lambertini (1987), Zaman *et al.* (1996), Shrivastav and Panda (1991). They reported that diets containing high protein throughout the whole periods of fattening caused reduction in growth rate.

Table 1. Mean body weight gain per week per group of broiler birds corresponding to the different levels of dietary protein treatment

Groups	No. of birds used	Protein supplemented (%)	Mean body weight (g) ± SE
A	5	Non-supplemented	403.33 ± 28.06
B	5	5	430.67 ± 34.59
C	5	10	417.33 ± 27.89
D	5	15	403.33 ± 25.76

### Effect on blood parameters

Haematological parameters are presented in Table 2. The mean value of each of the blood parameters TEC, Hb content, PCV, ESR and DLC all were within the normal except TEC corresponding to the different treatment groups. The TEC vary significantly ( $p < 0.05$ ) among different levels of protein supplemented group. These findings are similar to that of Donkoh *et al.* (1999) and Ahmed *et al.* (1994).

Table 2. Certain haematological values (Mean ± SE) in broiler birds supplemented with protein in the diet

S/N	Blood parameters	Groups of broiler birds				F-Value	P-Value
		A (n = 5)	B (n = 5)	C (n = 5)	D (n = 5)		
1.	TEC ( $10^6 / \text{mm}^3$ )	02.23 ± 0.04	02.69 ± 0.18	2.51 ± 0.12	2.27 ± 0.05	3.64*	0.036
2.	Hb (g%)	07.90 ± 0.19	08.20 ± 0.37	7.70 ± 0.26	7.70 ± 0.20	0.80 <sup>NS</sup>	0.513
3.	PCV (%)	33.20 ± 1.28	33.40 ± 1.33	34.6 ± 1.33	31.8 ± 0.73	0.92 <sup>NS</sup>	0.452
4.	Lymphocyte (%)	60.40 ± 0.87	60.00 ± 0.71	60.4 ± 0.81	60.6 ± 0.81	0.10 <sup>NS</sup>	0.960
5.	Monocyte (%)	01.80 ± 0.37	02.00 ± 0.45	02.2 ± 0.37	02.0 ± 0.32	0.18 <sup>NS</sup>	0.906
6.	Heterophil (%)	30.60 ± 0.68	30.40 ± 1.29	30.2 ± 0.58	30.2 ± 0.58	0.27 <sup>NS</sup>	0.848
7.	Eosinophil (%)	06.00 ± 0.71	06.40 ± 0.51	06.0 ± 0.55	05.2 ± 0.66	0.68 <sup>NS</sup>	0.580
8.	Basophil (%)	01.20 ± 0.37	01.20 ± 0.84	01.2 ± 0.37	01.0 ± 0.32	0.08 <sup>NS</sup>	0.978

A = Unsupplemented control, B = Supplemented with 5%, C with 10% and D with 15% protein, \*Indicates significant difference ( $p < 0.05$ ), <sup>NS</sup> Indicates not significant.

**Effect on meat yield characteristics**

The mean breast meat weights of the broiler chicks were greater in groups B (18.05 ± 0.09 g) and C (17.97 ± 0.12 g) than that of control (17.22 ± 0.13 g). The mean drum stick meat weight differed significantly (p < 0.01) in groups B (8.07 ± 0.07 g) but not in group C (7.27 ± 0.25 g) and A (7.66 ± 0.06 g). The mean shank weight in group B (3.97 ± 0.03 g) and C (3.91 ± 0.07 g) was found lower in comparison to groups A (4.14 ± 0.06 g) and D (4.03 ± 0.3 g). No significant difference was observed among the mean thigh meat and wing meat by any treatment.

Table 3. Meat yield (Mean ± SE) characteristics in different groups and the overall test of significance for their difference

Meat yield (Weight %)	Groups of broiler birds				F-Value	P-Value
	A (n = 5)	B (n = 5)	C (n = 5)	D (n = 5)		
Breast meat	17.22 ± 0.13	18.05 ± 0.09	17.97 ± 0.12	17.10 ± 0.07	23.098**	0.000
Thigh meat	09.38 ± 0.09	09.83 ± 0.10	09.57 ± 0.39	09.52 ± 0.17	1.88 <sup>NS</sup>	0.174
Drum stick	07.66 ± 0.06	08.07 ± 0.07	07.27 ± 0.25	07.20 ± 0.14	7.13**	0.003
Wing meat	04.21 ± 0.09	04.43 ± 0.18	04.34 ± 0.16	04.14 ± 0.09	0.97 <sup>NS</sup>	0.433
Shank	04.14 ± 0.06	03.97 ± 0.03	03.91 ± 0.07	04.03 ± 0.30	3.95*	0.028

A = Unsupplemented control, B = Supplemented with 5%, C with 10% and D with 15% protein, \*\*Indicates significant at 1% level, \*Indicates significant at 5% level, <sup>NS</sup>Indicates not significant.

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