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EFFECT OF DIFFERENT COMMERCIAL RATIONS ON THE HAEMATOLOGICAL VALUES AND PERFORMANCE OF BROILER CHICKS FROM 0 TO 5 WEEKS OF AGE

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ABSTRACT

Seventy-five day-old broiler chicks were fed four different commercial starter rations alongwith a control ration from 0.5 weeks. The average weight gain and feed efficiency varied from 668.94 – 958.70 gm and 2.13 – 3.00, respectively. The RBC's, Hb, Pcv, Mcv, McH, and McHc values of these chicks ranged from 2.46 – 2.72 m/mm^3; 6.70 – 7.82 gm/100 ml; 27.06 – 28.33%; 104.85 – 114.07 um^3; 25.85 – 31.57 pgm; and 23.70 – 28.29%, respectively. The results of all the commercial as well as control rations were quite satisfactory.

INTRODUCTION

Commercial feed industries have played an important role in exploiting the potential of the imported poultry birds in the country. Efficient and economical rations have been prepared by the feed millers to popularize their feeds under the existing market competition. However, the nutritional value of the formula feeds frequently gets effected due to the changes in the formulation as the same ingredients are not available at economical rates throughout the year. Moreover, the supply of good quality feed ingredients has not been ensured so far. Occasionally such handicaps coupled with poor managemental practices have led to a great economical loss to the commercial poultry raisers. Although evaluation of commercial feed has been sporadically done (Khan, 1972), a consistent and permanent evaluation system has not received due appreciation.

The stereo type evaluation studies usually involved the gross production parameters (Sultan, 1982) and have not shown precisely the changes occuring at

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cellular level in blood of the birds. Since the blood picture is an index of nutritional status (Sturkie, 1976) and blood values reflect the feed responses more precisely and earlier than the performance parameters; studies in this direction are required to be conducted to get the comprehensive perspective of feed evaluation. The study under report was, therefore, conducted to measure the effect of different commercial feeds on haematological values of broiler chicks during the early growth period (0-5 weeks) in relation to gross performance parameters.

MATERIALS AND METHODS

Seventy-five day-old broiler chicks of Ross-1 strain were randomly divided into 15 groups (experimental units) of 5 birds each. Four commercial starter rations* alongwith control (RationA**) were allotted to different groups in such a way that each ration was fed to three groups of birds randomly. The

Table 1. *Chemical composition of experimental broiler starter rations (dry matter basis)*

	Rations				
	A	B	C	D	E
Crude protein (%)	22.90	21.72	22.68	24.20	21.16
Ether extract (%)	4.05	3.45	4.43	4.68	4.64
Crude fibre (%)	3.37	4.21	3.55	3.20	4.45
Nitrogen free extract (%)	58.81	61.73	57.56	67.81	56.17
Total ash (%)	10.87	8.89	11.78	10.11	13.58
Metabolizable energy (Kcal/kg)	3083.00	3084.10	3065.40	3093.80	2989.60

* Commercial rations were manufactured by Niaz (B), Chenab (C), Gamma (D) and Khyber (E-Aves) Feed Industries.

** Ration A consisted of : maize grain 35%, rice polishings 15%, rice broken 10%, wheat bran 8%, maize gluten meal (60%) 6%, guar meal (Toasted) 10%, blood meal 6%, fish meal 5%, molasses cane 2.5%, ground limestone 1.5%, dicalcium phosphate 0.5% and vitamin mineral premix 0.5%.

chemical composition of the rations as per analysis (A.O.A.C., 1980) has been shown in Table 1. The metabolizable energy was calculated according to the method of Miller and Payne (1959).

The starter rations were fed *ad libitum* upto 5 weeks of age and the feed was offered twice a day. All the birds were weighed at the start of experiment and at weekly intervals thereafter upto 5th week of age. The daily feed consumption of each group was recorded to get the total feed consumption during the experimental period. At the 5th week of age, the blood samples of all the birds were taken from wing vein for determining the haematological values including Pcv, Hb and RBC's (Banjamin, 1978).

The data were subjected to statistical analysis using analysis af variance technique and comparison of mean difference was made by applying Duncan's Multiple Range Test (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

The results of this study are presented under the two headings, haematological values and general performance.

HAEMATOLOGICAL VALUES

All the birds under experiment were used for determining the haematological values by drawing blood from wing vein at the age of 5 weeks. The blood was examined for packed cell volume (Pcv), haemoglobin (Hb), and erythrocyte count (RBC). Mean cell volume (Mcv), mean cell haemoglobin (McH) and mean cell haemoglobin concentration (McHc) were also calculated. Average haematological values have been presented in Table 2. The data on different blood values were analysed using analysis of variance technique and the results have been presented in Table 3.

Packed Cell Volume

The average values for Pcv were 28.13, 28.26, 27.93, 28.33 and 27.06% on rations A, B, C, D and E, respectively. The analysis of variance gave non-significant difference among the Pcv value of chicks fed different rations. Inspite of variations in the protein level of the ration, the Pcv values did not differ significantly. *(Saliman and Hustan (1974) have also reported that the protein level of diet did not effect the Pcv.

Table 2. *Average haematological values of broiler chicks fed different experimental rations*

Blood parameters	Rations				
	A	B	C	D	E
Packed cell volume (%)*	28.13	28.26	27.93	28.33	27.06
Haemoglobin concentration (gm/100 ml)	ab 7.67	a 7.82	bc 7.22	d 6.70	cd 6.90
Red blood cells* (m/mm^3)	2.46	2.49	2.72	2.60	2.60
Mean cell volume (μm^3)	ab 109.23	a 114.07	b 100.76	ab 109.53	ab 104.35
Mean cell haemoglobin (Pgm)	a 30.91	a 31.57	b 25.85	b 25.89	b 26.74
Mean cell haemoglobin concentration (%)	a 28.29	ab 27.75	bc 25.93	d 23.70	cd 25.71

The same alphabet in a row shows non-significant differences.

*The differences among the values were non-significant statistically.

Table 3. *Analysis of variance of data on different haematological values*

Source of variation	d. f.	Mean squares					
		Pcv	Hb	RBC	Mcv	McH	McHc
Rations	4	5.58 N.S	3.45**	0.139 N.S	384.57*	118.66**	49.87**
Experimental error	70	4.68	0.415	0.097	144.87	10.95	5.94

N.S = Non-significant

* = significant

** = Highly significant

Haemoglobin Concentration (Hb)

The Hb level of blood is considered as an index of the state of health of animals. The average values for Hb were 7.67, 7.82, 7.22, 6.70 and 6.90 gm/100ml per chick on rations A, B, C, D and E, respectively. The chicks raised

on ration B had the highest Hb content whereas those on ration D hda the lowest Hb values. The analysis of variance revealed significant ($P<0.01$) difference among the Hb values of chicks fed different experimental rations. According to DMR test Hb value of chicks on ration B was found to be significantly ($P<0.01$) higher than those on ration C, E and D but the differences between the mean Hb values in respect of rations A and D, D and C, C and E and E and D were non-significant. The values observed in this study were slightly lower than those reported by Wels and Horn (1965) as 8.92 to 9.20 gm/100ml and Petculescu and Caprarin (1980) as 8.54 to 10.00 gm/100 ml.

Red Blood cells

The average RBC values of chicks fed rations A, B, C, D and E were found to be 2.46, 2.49, 2.72, 2.60 and 2.60 million/cubic mm, respectively. Apparently, maximum RBC's were found in the chicks on ration C and minimum on ration A. However, the differences among the rations were found to be non-significant statistically. The RBC values observed during the study were closer to those reported by Twisselmann (1939) and strukie (1976).

Mean Cell Volume

Average Mcv values of chicks fed rations A, B, C, D and E were 109.23; 114.07, 100.76, 109.53 and 104.85 μm^3, respectively. Analysis of variance revealed significant differences among the rations. The chicks raised on ration B had the highest Mcv value and those on ration C, the lowest value. DMR test revealed that ration B gave significantly ($P<0.01$) higher Mcv values than ration C. But the differences between rations A, B, D, and rations A, C, D and E were non-significant.

Mean Cell Haemoglobin

Average McH values were 30.91, 31.57, 25.85, 25.89 and 26.74 pgm in chicks on rations A, B, C, D and E, respectively. The average McH values of different experimental rations ranked in a descending order of B, A, E, D and C. The McH values of blood of chicks fed various rations showed significant ($P<0.01$) differences. DMR test showed that rations B and A had significantly higher McH values of blood as compared to those of other three experimental rations. The differences between mean values of rations B and A and rations

E, D and C were found to be non-significant.

Mean Cell Haemoglobin Concentration

The average McHc values of chicks fed rations A, B, C, D and E were 28.29, 27.75, 25.93, 23.70 and 25.71%, respectively. The highest value (28.29%) was observed in chicks on ration A, and was followed by that of ration B and thereafter by those of rations C, E and D. Ration D showed the lowest McHc value. The data on McHc values showed significant ($P<0.01$) differences among the five experimental rations. DMR test showed that ration A had higher McHc value than C, E and D but the differences between A and B were non-significant, whereas non-significant differences between B and C, C and E and E and D were observed.

GENERAL PERFORMANCE

The commercial rations showed variable effects in terms of weight gain, feed consumption and feed efficiency.

Table 4. *Performance of broiler chicks on various experimental rations*

Rations	Average per bird during 5 weeks of Age		
	Weight gain (gm)	Feed consumption (gm)	Feed efficiency feed/gain
A	668.9	2010.3	3.00
B	648.7	1932.0	2.98
C	958.7	2079.0	2.17
D	944.2	2010.8	2.13
E	838.7	1929.0	2 30

Statistically significantly ($P<0.01$) higher gain in weight was observed in case of birds fed rations C and D. Ration E was next in order with respeet to weight gain, however, the differences in weight gain of birds fed rations A and B were non-significant. The birds under different experimental rations consumed 1929.00 to 2079.00 gm feed on an average during a period of five weeks. Some depression was observed in the feed consumption in case of rations B and E. Feed efficiency valuees ranged from 2.13 to 2.30 in case of rations C, D and

E and comparatively more feed was consumed per unit gain when rations A and B were fed i. e., 3.00 and 2.98, respectively. A perusal of Table 4 explains the variation in weight gain, feed consumption and feed efficiency values. The growth pattern of birds on different rations has been depicted in Fig. 1.

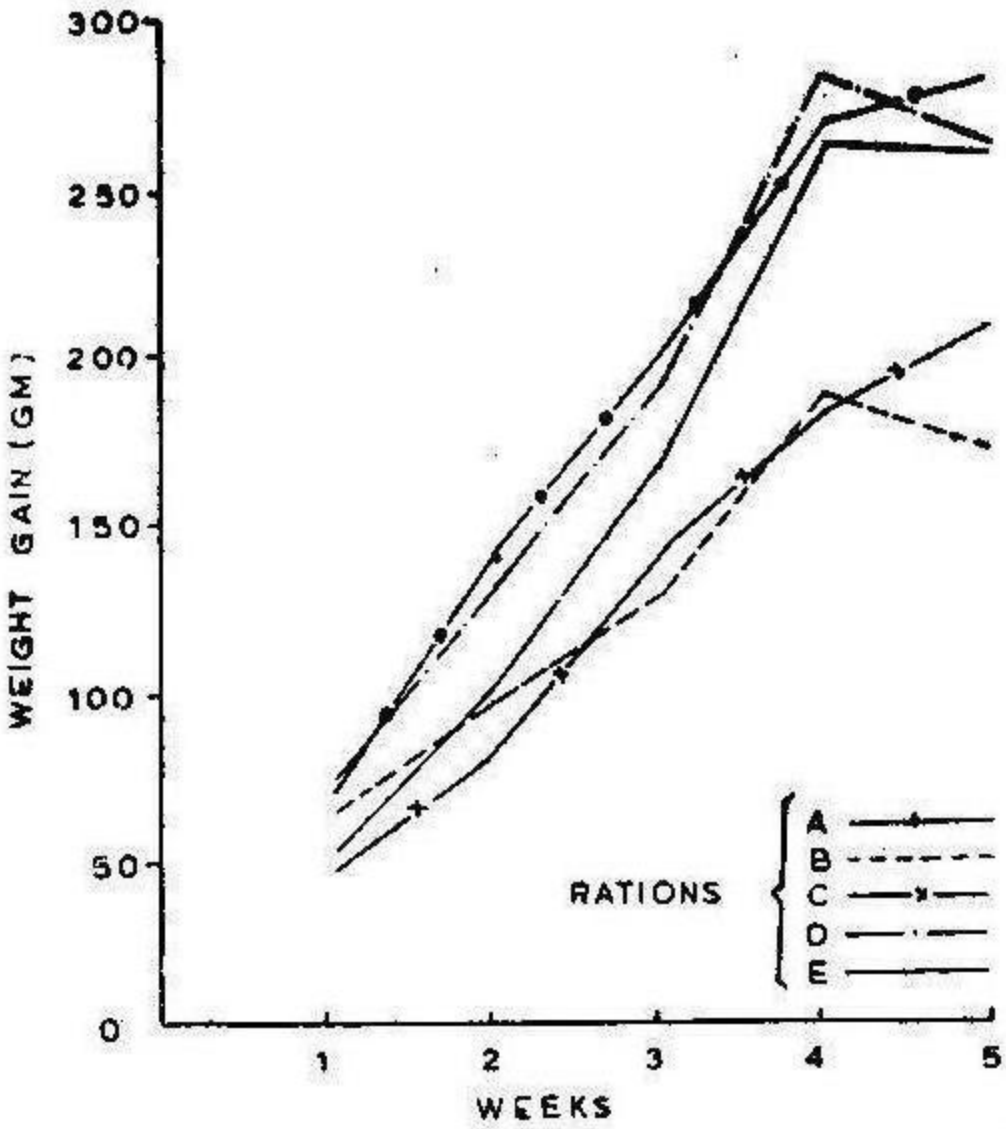

FIG:1 SHOWING THE GROWTH PATTERN OF BIRDS RAISED ON DIFFERENT EXPERIMENTAL RATIONS.

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