HAEMATOLOGICAL INDICES OF TWO BROILER STRAINS FED FOUR DIFFERENT SOURCES OF PROPRIETARY FEEDS

Onodugo, M.O., Udeh, F.U., Edeh, H.O., Wilfred, C.V and Okafor P.C[1]
Department of Animal Science, University of Nigeria, Nsukka
1. Department of Agricultural Education, Federal College of Education Eha-Amufu,
Correspondence email: matthew.onodugo@unn.edu.ng; +2348035491878

ABSTRACT
This study was conducted to determine the interaction effect of different sources of feed on the haematology of two broiler strains. A total of 128-day old broiler chicks (64 Agrited- ross 308 strain and CHI-Arbor Acres strain) were randomly allocated to Eight (8) experimental treatments designated as T1 (feed D + Agrited), T2 (feed D + CHI), T3 (feed A + Agrited), T4 (feed A + CHI),T5 (feed B + Agrited), T6 (feed B + CHI), T7 (feed C+ Agrited), T8(feed C+ CHI) in a 4x2 factorial design arranged in a completely randomized design (CRD). Blood samples were collected and analyzed in the laboratory. The Study showed that there were significant (P <0.05) difference in haematological indices in which White blood cell (WBC) in T4 recorded the highest (18.50 x103), although statistically similar with birds on T7 (17.50 x103), while the result also shows that WBC in T2 had the lowest value (10.50 x103). The result also showed that T3 was significantly (P <0.05) higher than other treatment in packed cell volume (PCV), haemoglobin concentration (HB) and Red blood cell (RBC) count (31.50%, 10.95 g/dl, and 4.50 x106) respectively. It was therefore concluded that T3 and T7can be safely used for improved poultry production and health promoting cells of the broiler birds than other feeds.
Keywords: haematological indices, broiler birds and feed sources

INTRODUCTION

In Nigeria, different poultry species contribute to the animal protein supply of the populace in terms of eggs laid and meat produced (NPC, 2010). Feeding poultry for optimum growth production requires that the birds consume appropriate balanced diets for the health and productivity, it is important that they be fed diets that meet their nutritional requirements. Nse Abasi *et al*. (2014) noted that dietary components affect the blood profile of healthy birds. The blood transports or conveys nutrients and materials to different parts of the body. Therefore, whatever affects the blood, either nutrition or drugs will certainly affect the entire body adversely or moderately in terms of health, growth, maintenance and reproduction. According to Iyaode *et al*. (2020) broiler chickens are fast growing birds and are described as good converters of feed. They are marketed from sixth week to twelve weeks. Poultry farmers who rely on commercial feeds sourced from the market always suffer some forms of financial loss due to sub-standard nature of such feeds (Olajide. *et al*., 2020). Feed consumption accounts for the major cost of poultry production which is responsible for more than 70% of the total cost (Medina *et al.,* 2020).

The analysis of blood components is a readily-available and rapid means of knowing and interpreting the clinical, nutritional and metabolic health state of animals (Etimet al., 2014).

MATERIALS AND METHODS

Location of study

This study was carried out at the poultry unit of the Department of Animal Science Teaching and Research Farm, University of Nigeria, Nsukka.

Experimental Animals, Design and Management

A total of one hundred and twenty eight (128) day old, different strains of broiler chicks, which includes, sixty-four (64) Ross (Agrited) and sixty-four (64) Arbor acre (CHI) was used for the study. The birds were assigned randomly by weight to each of the four experimental feed. Each treatment was replicated twice into experimental pen measuring 3.4m width X 4m length with eight birds each. The pen floor was covered with fresh wood shavings as litters. General flock prophylactic management and routine vaccination was administered. Feed and water were provided ad libitum throughout the feeding trial. The room temperature was monitored, heat source was added at night to keep the birds warm and flood light were also provided for them to feed at night. At the end of

8weeks, two birds were chosen per replicate in which 2.5 mls of blood was collected with sterile syringes and needles from the wing vein (brachial vein) of each bird into tubes containing Ethylene Diamine Tetra Acetic Acid (EDTA) as anti-coagulant for analysis of blood. Proximate analysis was done on the feeds both at starter and finisher diets.

Proximate analysis

Table 1: The proximate analysis % of the four experimental feeds (feed A-D) for broiler chicks at starter phase (0-4weeks).

Composition	Feed A	Feed B	Feed C	Feed D
Moisture	10.60	10.00	10.60	11.00
Crude protein	19.89	18.00	19.89	16.57
Ash	2.50	2.20	2.50	2.50
Ether extract	3.50	4.50	3.50	4.00
Crude fiber	1.65	1.80	1.65	2.50
Nitrogen free extract NFE	61.91	63.50	61.91	63.93

Table 2: The proximate analysis (%)of the four experimental feeds (feed A-D) for broiler chicks at finisher phase (5-8weeks)

Composition	Feed A	Feed B	Feed C	Feed D
Moisture	10.60	10.00	10.60	11.00
Crude protein	16.59	17.50	17.90	14.50
Ash	2.50	2.20	2.50	2.50
Ether extract	4.90	4.70	4.50	4.00
Crude fiber	4.70	4.50	4.00	7.30
Nitrogen free extract NFE	65.51	63.10	64.46	63.50

Experiment was a 4x2 factorial arrangement in a completely randomized design and the data collected were subjected to analysis of variance (ANOVA) using Statistical Package for Social Sciences (SPSS version 25). Significant means were separated using Duncan's New Range Test (DNMRT) at 5% level of significance.

RESULTS AND DISCUSSION

Table 3: Means and standard error of the interaction of breed and feed on the haematology of broiler birds.

Treatment	T1	T2	T3	T4	T5	T6	T7	T8	P.V (%)
Parameters									
PCV In %	26.50±.50^{d}	28.50±0.50^{c}	31.50±.50^{a}	29.50±0.50^{bc}	30.50±0.50^{ab}	29.00±0^{bc}	30.5±.50^{ab}	28.50±.50^{c}	0.001*
HB(g/dL)	9.00±0^{b}	9.30±0.10^{b}	10.95±.05^{a}	10.45±0.05^{a}	10.50±0.20^{a}	9.85±.05^{ab}	10.7±.10^{a}	10.05±.85^{ab}	0.022*
RBC (x10^6/mm^3	3.90±.01^{bc}	3.50±0.10^{c}	4.50.10^{a}	4.50±0^{a}	4.45±0.15^{a}	4.40±.20^{a}	4.25±.01^{ab}	4.1±0.231^{ab}	0.005*
MCHC in %	33.34±.01^{c}	33.08±0.23^{c}	33.78±.28^{bc}	34.72±0.06^{a}	34.50±0.17^{ab}	33.15±.04^{c}	33.7±.43^{bc}	34.53±.32^{ab}	0.005*
MCH (pg)	23.72±.59^{bc}	26.06±0.51^{a}	24.06±.37^{bc}	23.12±0.01^{c}	24.03±0.08^{bc}	24.56±.05^{b}	24.7±.11^{b}	24.05±.40^{bc}	0.008*
MCV (fl)	69.15±.25^{c}	76.43±0.55^{a}	69.84±.28^{bc}	66.71±0.05^{d}	69.93±0.17^{bc}	71.41±.09^{bc}	72.4±.32^{b}	72.42±.27^{b}	0.000*
WBC (x10^3/mm^3	13.50±.50^{b}	10.50±0.50^{c}	12.50±.50^{b}	18.50±0.50^{a}	13.00±0^{b}	11.00±.50^{c}	17.5±.50^{a}	12.50±.50^{b}	0.000*

Means on the same row with different superscripts $^{a, b, c, d}$ are statistically different at (P<0.05) while means of the same superscript are not significant (P>0.05), NS: Non-significant. T1= D+Agrited, T2= D+CHI, T3= A+Agrited, T4= A+CHI, T5=B+Agrited, T6=B+CHI, T7= C+Agrited, T8= C+CHI. PCV: Packed cell volume, HB: Haemoglobin concentration, RBC: Red blood cell, MCV: mean cell volume, WCB: White blood cell, MCH: Mean corpuscular haemoglobin and MCHC: Mean corpuscular haemoglobin concentration

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Table 3 represents the interaction of feed and breed on the haematology of broiler birds. There was significant (p<0.05) difference in all the haematological parameters studied. The PCV of birds on T3 (31.50 %) were statistically higher compared to other treatments while birds on T1 recorded the lowest value (26.50 %) for PCV. Birds on T3 has the highest Haemoglobin concentration (HB) values (10.95 g/dL), although they were statistically similar with birds on T4 (10.45 g/dl), T5 (10.50 g/dl), and T7 (10.70 g/dL). Nevertheless, the Haemoglobin concentration (HB) of the birds on the T1 had

the lowest haemoglobin values (9.00 g/dL). The red blood cell (RBC) count of birds on T3 (4.50 $x10^6$) were statistically higher ($p<0.05$) although found to be statistically similar with birds on T4 (4.50 $x10^6$), T5 (4.45 $x10^6$), and T6 (4.40 $x10^6$) compared to other treatments. The Mean cell volume (MCV) of birds on T2 (76.43 *fl*) was the highest while birds on T4 had the lowest value (66.71 *fl*). Birds on T4 recorded the highest value (18.50 $x10^3$) for the White blood cell (WBC), although statically similar with birds on T7 (17.50 $x10^3$) while birds on T2 recorded the lowest value (10.50 $x10^3$). The Mean corpuscular haemoglobin (MCH) of birds on T2 had the highest value (26.60 pg) while birds onT4 recorded the lowest value (18.50 pg).

Discussion

The results show that HB, WBC, RBC and PCV counts increased with the varying commercial feed. The PCV values obtained in the present study were within the range of 27.50%-30.50%, which was in accordance with the normal range (Hagan *et al.*, 2022) but lower than 32.3 % reported for chickens in Nigeria (Iyalode *et al*, 2020). Alonge *et al*. (2017) sited (Banergee et al, 2002) which said The RBC counts and PCV are known to be mostly affected by dietary treatment. PCV when too high is an indicator of toxic factors which could have adverse effect on the formation of blood (Iyalode *et al*, 2020). The results obtained for Hb follow the same pattern with that of PCV with values for birds being within the normal range as reported by hagan *et al*. (2022). The Hb values obtained were within the average values of 10.27 g/dl as reported by Alonge *et al*. (2017). Range values for RBC was 3.70-4.50 x 10^6 which was higher than the normal range (Hagan *et al.,* 2022) and also higher than the values reported by (Iyalode *et al,* 2020). The ranges of value of the mean cell volume (MCV) are below the normal range as reported by Hagan *et al*.(2022).

CONCLUSION AND RECOMMENDATION

It is therefore concluded that the interaction of breed and feed on the haematology of broiler birds in T3 and T7 performed better in PVC, HB, RBC and WBC over others and therefore recommended while T2 performed least.

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