HAEMATOBIIOCHEMICAL PICTURES OF HEALTHY HUBBARD CLASSIC BROILER BIRDS

M. G. Faruque, M. R. Alam, M. E. R. Bhuiyan and M. Muniruddin
Department of Physiology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

ABSTRACT
To evaluate the certain haematobiochemical parameters in different ages of Hubbard Classic broiler birds, the study was performed at Kazi Farms Ltd., Gazipur in collaboration with the Department of Physiology, Bangladesh Agricultural University, Mymensingh for a period of one month (1st to 30th March 2002). On haematobiochemical examination, total erythrocyte count, haemoglobin content, packed cell volume, clotting time, glucose and uric acid concentration were gradually increased with advancement of age of birds. The values of TEC, Hb, PCV, clotting time, glucose and uric acid were recorded at day old birds as average 2.13 ± 0.62 million /cum, 3.90 ± 0.09 g/dl, 9.16 ± 0.24 s, 37.20 ± ±.50 second, 179.20 ± 8.95 mg/dl and 3.72 ± 0.58 mg/dl respectively while the values at day 30 were 2.43 ± 0.07 million /cum, 7.26 ± 0.18 g/dl, 28.20 ± 0.34 ±, 20.60 ± 10.17 second, 271.60 ± 8.56 mg/dl and 6.42 ± 0.65 mg/dl respectively which were found statistically significant (p < 0.01). On the other hand erythrocyte sedimentation rate, cholesterol and uric acid concentration were gradually decreased where significantly (p < 0.05) higher values (2.80 ± 0.20 mm in 1st hour, 330.40 ± 38.52 mg/dl and 26.42 ± 2.06 mg/dl respectively) were recorded at day old chicks and lower values (1.80 ± 0.37 mm in 1st hour, 104.20 ± 3.24 mg/dl and 1700. ± 0.97 mg/dl respectively) were recorded at age of 30 days old of birds. The findings of the present work clearly indicate that age has got influential effect on the body hematopoietic system of the broiler birds as well as haematobiochemical values.

Keywords: Broiler, haematologiacal, biochemical, values

INTRODUCTION
Broiler industry has been proved as promising industry and it has given immense priority in fulfilling the increased demand of animal protein. The exsiccated breed of chicken is now almost well adapted to our hot humid climate. They are also well accepted by the poultry farmers for their higher productivity. Analysis of normal haematobiochemical parameters and its knowledge can be used for assessing the health status of the flock. The haematobiochemical constituents of blood are relatively constant. Fluctuation occurs due to age, sex, breed, climate, geographical locations, nutritional status, seasons and present status of the individual (Dales, 1955). Erythrocyte and haemoglobin supply oxygen to the body tissues for metabolic activities and carry waste products like carbon dioxide from tissues to lungs (Dukes, 1955). Glucose is the main source of energy in all tissue of the body. So, its deficiency produces debility, emaciation and lowered growth rate (Dickens et al., 1968). Cholesterol is an important metabolic precursor for biosynthesis of the steroid hormones in the gonad and adrenal. So, cholesterol indirectly involves with ovulation, spermatogenesis and sexual maturity (Chung et al., 1965).

The blood values obtained from the study can be used to evaluate the state of health of an indispensable preliminary knowledge of the biological material chosen for research. Very limited haematobiochemical studies (Ahmad et al., 1998) have so far been done with exotic breeds in Bangladesh climate condition. The present investigation was therefore carried out to study the normal haematobiochemical parameters of broiler birds (Hubbard Classic) at different age groups.

MATERIALS AND METHODS
The experiment was conducted at Kazi Farms Ltd., Sirajpur with collaboration in the Department of Physiology of Agricultural University (BAU), Mymensingh for a period of 1 month from 1st to 30th March 2002. A total of 20, day-old Hubbard Classic broiler chickens were used to study the effect of age on the haematobiochemical parameters namely, total erythrocyte count (TEC), haemoglobin concentration (Hb), packed cell volume (PCV), erythrocyte sedimentation rate (ESR), clotting time, blood glucose, cholesterol, urea and uric acid. The chickens were reared throughout the entire period of study in well ventilated and protected poultry shed of Kazi Farms Ltd. Gazipur with proper light, space, water supply, sanitation and litter. During the experimental period size birds were maintained with standard broiler starter and finisher feed formulated by Kazi Feeds Ltd. as well as vitamin mineral premix supplemented. The routine vaccination was done properly.

Present address: Department of Physiology, Pharmacology and Biochemistry, Chittagong Government Veterinary College, Chittagong - 4202.

Copyright © 2005 Bangladesh Society for Veterinary Medicine

All rights reserved 1729-7893/05/05
On the particular day of blood collection birds were brought to the physiology laboratory in a well ventilated bamboo box to avoid the danger of suffocation. Blood samples were collected aseptically with syringe and needle either from the wing vein or cutting of toe nail from randomly selected five chickens depending on age and then transferred to sterile tubes containing anticoagulant (citrate solution) at the rate of 1:10 for haematological examination. All the haematological parameters as TEC, Hb, PCV and ESR were determined as per method described by Shatney (1983).

Recording of clotting time was done by cutting of toe nail for day old chicks and by puncturing the wing vein of a six week's local for other aged chickens. When blood started to come out, a clean and dry glass slide used to take a drop of fresh blood from that place. The clotting time was then recorded in seconds.

The biochemical parameters like glucose, cholesterol, urea and uric acid were studied using Reflotron automaticanalyser from Roche diagnostics. The blood sample was drawn up using the Reflotron pipette avoiding the inclusion of air and this was applied as a deep to the center of the application zone without allowing the pipette tip to touch the zone. The strip was inserted horizontally into the instrument unit housing a clip. Then the biochemical parameters appeared on the display and data were recorded. Data obtained were subjected to statistical analysis. The results were expressed in mean, standard deviation and standard error were calculated according to the standard procedures (Snedecor and Cochran, 1969).

RESULTS AND DISCUSSION

The results of TEC, Hb, PCV, ESR clotting time and of some biochemical (glucose, cholesterol, urea and uric acid) values of the experimental birds are shown in Table 1. Total erythrocyte count, haemoglobin content and packed cell volume increased with the advancement of age and these parameters were significantly (p < 0.01) higher at 30 days of age. These findings were similar with the observations made by Dukus (1955), Kundu et al. (1995), Prafulkumar et al. (1996) and Montes et al. (1983). However the erythrocyte sedimentation rate was inversely related to age and day 0 day value was significantly (p < 0.05) higher (2.80 ± 0.20 mm in 1 hr) followed lower value on day 10 (2.40 ± 0.24), 20 (2.00 ± 0.00) and 30 (1.80 ± 0.37). Higher ESR at early age in the present finding was correlated with the findings reported by Studer (1954). The increase of TEC, Hb and PCV were higher in older than those recorded in younger chicks whereas the value of ESR was found to be reverse and it might happen that haemopoietic organs were more active and developed in aged birds than the younger and the digestive system become well balanced to absorb proper level of essential nutrients which are essential for erythropoiesis. Blood clotting time was directly related to age.

Table 1. Effect of age on certain haematological biochemical values of Hubbard Classic broiler chickens

<table>
<thead>
<tr>
<th>S/N</th>
<th>Parameters</th>
<th>Unit</th>
<th>Age (0-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Day1</td>
</tr>
<tr>
<td>1.</td>
<td>TEC</td>
<td>million/cm³</td>
<td>1.23 ± 0.02²</td>
</tr>
<tr>
<td>2.</td>
<td>Hb</td>
<td>g/dL</td>
<td>3.90 ± 0.39¹</td>
</tr>
<tr>
<td>3.</td>
<td>PCV</td>
<td>%</td>
<td>19.60 ± 0.24³</td>
</tr>
<tr>
<td>4.</td>
<td>ESR</td>
<td>mm/h</td>
<td>2.80 ± 0.20²</td>
</tr>
<tr>
<td>5.</td>
<td>Clotting</td>
<td>Second</td>
<td>3.70 ± 1.50¹</td>
</tr>
<tr>
<td>6.</td>
<td>Glucose</td>
<td>mg/dl</td>
<td>179.20 ± 8.95³</td>
</tr>
<tr>
<td>7.</td>
<td>Cholesterol</td>
<td>mg/dl</td>
<td>330.40 ± 38.52²</td>
</tr>
<tr>
<td>8.</td>
<td>Urea</td>
<td>mg/dl</td>
<td>26.42 ± 2.06³</td>
</tr>
<tr>
<td>9.</td>
<td>Uric acid</td>
<td>mg/dl</td>
<td>3.72 ± 0.58³</td>
</tr>
</tbody>
</table>

Results with different superscript letters differ significantly (p < 0.05) within the same row except ESR and urea which were significant (p < 0.05).
Lower values were observed at day old and significantly (p < 0.01) higher clothing time with the advancement of age in all the birds observed in the present study which is coincided with the finding of Kundo et al. (1993). The possible cause of elevation of clothing time may be due to a reduction of thyroidotic or any other clotting factor and or reduced activities of the liver.

Increased glucose and uric acid concentration were recorded with the advancement of age and significantly (p < 0.01) higher day 30. The present finding of glucose level is in close agreement with the finding of Kundo et al. (1993) but contradicts with the finding of Prabhakaran et al. (1996) who reported that age of bird had no influence on blood glucose concentration. Uric acid concentration in the present study is higher with the finding of Joub et al. (1995). On the other hand cholesterol and urea values were inversely related to the advancement of age and all the difference were significant (p < 0.01). The cholesterol level in the present study showed a negative correlation with the age. This might be due to excess storage of cholesterol in the yolk sac. The present finding was correlated with the finding of Delisio and Cavallini (1996) who reported that the cholesterol values were decreased with the advanced age on Egyptian quails but Furian et al. (1999) reported that blood glucose, cholesterol and uric acid were not affected by age or strain.

Although the present study was limited with few haematobiochemical parameters it may be concluded that the age of the birds has effect on their haematobiochemical parameters.

REFERENCES
2. Chung KA, Ruger KC and Stadelman WS (1956). The effect of dietary cholesterol and dietary fatty on cholesterol content lipid composition of egg yolk and various body tissues. Poultry Science 44: 221-228.