Seasonal Variations in Blood Glucose and Cholesterol Contents of *Gallus domesticus*.

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The study shows that blood glucose and blood cholesterol contents in *Gallus domesticus* exhibit minor to major fluctuations, round the year.

Season in general has great influence on all sorts of bio-physiological parameters of almost all animals. But still many animals are able to maintain a perfect and constant haemostasis, despite rigorous alterations in a number of extrinsic physio-chemical environmental factors and intrinsic bio-physiological activities of the animals. Birds, are no exceptions, and perhaps tend to show some cyclic, seasonal or circannual rhythm, in their various physio-biochemical moities. However, quite scanty reports are available on this aspect of high eco-physiological importance of birds¹⁻³.

MATERIALS AND METHODS

The present studies were made on both the sexes of *Gallus domesticus*. Seven male and an equal number of female birds of twelve months age, were regularly obtained in the second week of each month, from State poultry farm at Pithoragarh. The method of their maintenance, feeding and taking blood samples etc. were the same as described earlier⁴. The total blood glucose was determined by the Nelson-Somogyi method⁵, while the blood cholesterol level was determined following the methods of Rosenthal *et. al.*⁶.

RESULTS

The highest value of total blood glucose was obtained in the month of March
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being $230.0 \pm 33.59$ mg/100 ml. During the subsequent months the blood glucose content depleted till December when the lowest value of $88.10 \pm 10.68$ mg/100 ml was obtained (Fig. 1). Following December, the blood glucose contents show a gradual rise till March, when the peak value was recorded.

The highest value for total blood cholesterol was obtained in the month of July, being $265.0 \pm 27.71$ mg/100 ml. The value suddenly declined in the next month of August by $33.81\%$ which was the lowest value of this parameter ($162.14 \pm 45.46$ mg/100 ml). The cholesterol contents again showed a gradual rise (Fig. 1) till October, followed by little fall during the subsequent months.

DISCUSSION

A few reports are available on the seasonal variations in the blood glucose and

![Graph of seasonal variations in total blood glucose and cholesterol contents of *Gallus domesticus*](image)
cholesterol contents of birds. In adult canvasback duck (*Aythya valisineria*) the total blood glucose value decreased during November to March. Similarly in *Columba livia* the blood glucose level of both the sexes fluctuates throughout the year, ranging between 145.64 to 197.98 mg/100 ml. In this bird the highest value of blood glucose for male was reported in the month of November while for female in August and lowest values in the month of December, for both the sexes.

In the present studies the total blood glucose level (as pooled for both the sexes) ranged between 88.10 to 230.0 mg/100 ml. Highest value was found in the month of March and lowest value in the month of December, as was reported for *Columba livia*. As a corollary higher glucose level in the lizard *Varanus griseus* is reported during summers when the animals are active. In the present studies, it is also observed that blood glucose contents were more during summer months than in the winter months. May be this has some correlation with the increasing temperature. However, the highest value of blood glucose has no relationship with the highest temperature, as noted in the month of March and June, respectively (Table-1).

**Table 1: Annual variations in the ambient temperature (°C) of the laboratory.**

<table>
<thead>
<tr>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>16:00</td>
<td>22:00</td>
<td>22:71</td>
</tr>
<tr>
<td>±0.65</td>
<td>±0.65</td>
<td>±0.76</td>
<td>±0.70</td>
</tr>
<tr>
<td>(8—10)</td>
<td>(15—17)</td>
<td>(21—23)</td>
<td>(22—24)</td>
</tr>
<tr>
<td>May</td>
<td>June</td>
<td>July</td>
<td>August</td>
</tr>
<tr>
<td>22:14</td>
<td>23:86</td>
<td>23:00</td>
<td>23:43</td>
</tr>
<tr>
<td>±1.81</td>
<td>±0.99</td>
<td>±0.76</td>
<td>±0.49</td>
</tr>
<tr>
<td>(21—.5)</td>
<td>(23—25)</td>
<td>(22—21)</td>
<td>(23—.4)</td>
</tr>
<tr>
<td>September</td>
<td>October</td>
<td>November</td>
<td>December</td>
</tr>
<tr>
<td>20:29</td>
<td>19:50</td>
<td>16.00</td>
<td>10:57</td>
</tr>
<tr>
<td>±0.96</td>
<td>±0.50</td>
<td>±0.00</td>
<td>±0.49</td>
</tr>
<tr>
<td>(19—21)</td>
<td>(19—20)</td>
<td>(16)</td>
<td>(10—11)</td>
</tr>
</tbody>
</table>

In both the sexes of *Columba livia* it has been reported that the blood cholesterol values fluctuate throughout the year and ranged between 158.2 to 263.6 mg/100 ml.
This is in agreement with the present findings in *Gallus domesticus* as the range of blood cholesterol was noted between 162.14 to 265.0 mg/100 ml (Table-1). In *Columba livia* highest value of blood cholesterol was reported during April and lowest value in December for both sexes, but in the present studies the highest value of blood cholesterol was found in the month of July which falls suddenly and sharply to give the lowest value in the next month of August (Fig. 1). Sudden fall in the blood cholesterol value has also been reported by some earlier authors for other vertebrates, such as *Calotes versicolor*, *Rana tigrina* and *Rita rita*.

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REFERENCES