SOME ASPECTS OF THE COMPOSITION OF BUFFALO SEMEN

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An earlier report from this laboratory (Banerjee & Ganguli, 1971) was concerned with the electrophoretic and gel filtration behaviour of seminal plasma proteins in Zebu and buffalo bull semen. The chemical composition of Zebu semen has been reported by Mann (1964) and that of buffalo semen by Roy, Karnik, Lukuture, Bhattacharya & Bhattacharya (1950) and Roy, Pandey & Rawat (1960). The present work was undertaken in order to evaluate the nature of the composition of semen from Zebu and buffalo bulls maintained in our Institute's herd.

Semen samples were collected once a week, using the artificial vagina technique described by Walton (1945). Seminal plasma was separated by centrifuging whole semen at 2000 rev/min for 20 min.

Sperm counts were carried out by the method of Herman & Madden (1953). Fructose was estimated by the method of Roe (1934). Sialic acid, citric acid and ascorbic acid were determined by the methods described by Warren (1959), International Dairy Federation (1967) and Gyorgy (1950), respectively. The level of DNA was measured by the methods of Burton (1956) and Summerhill & Olds (1961). Determination of total nitrogen, non-protein nitrogen, calcium, magnesium and phosphorus were carried out according to the methods described by Hawk, Oser & Summerson (1947).

The sperm density of Zebu bull semen (1091.8 ± 92.9 x 10^6/ml) was markedly higher than that of buffalo bull semen (578.5 ± 97.8 x 10^6/ml). Wide variations in sperm concentration were observed between samples and also from day to day. Mahmoud (1952) also reported wide variations in the sperm concentrations in Egyptian buffalo semen.

Levels of the constituents measured in whole semen were generally higher in Zebu bull semen than in buffalo bull semen, though the DNA concentration was slightly higher in buffalo semen. Sialic acid and non-protein nitrogen concentrations in Zebu bull semen were higher than in buffalo bull semen. In both species, whole semen contained more of these constituents than did seminal plasma. The level of citric acid was higher in Zebu bull semen, but in both species, the seminal plasma contained slightly higher concentrations of this constituent than the whole semen. Ehlers, Flerchinger & Erb (1953) also observed a similar phenomenon in Zebu bull semen. The present study indicated a lower level of ascorbic acid in buffalo bull semen than in Zebu bull semen. Both buffalo and Zebu bull semen had similar levels of inorganic phosphorus, calcium and magnesium (Table 1).
Table 1. Levels of certain constituents in whole semen and seminal plasma of Murrah buffalo and Zebu bulls

<table>
<thead>
<tr>
<th>Nature of sample</th>
<th>Source of semen</th>
<th>Fructose</th>
<th>Total nitrogen</th>
<th>Total phosphorus</th>
<th>DNA</th>
<th>Sialic acid</th>
<th>Citric acid</th>
<th>Ascorbic acid</th>
<th>Non-protein nitrogen</th>
<th>Inorganic phosphorus</th>
<th>Calcium</th>
<th>Magnesium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole semen</td>
<td>Buffalo</td>
<td>623.8 ± 83.6 (10)*</td>
<td>684.1 ± 39.4 (5)</td>
<td>60.1 ± 5.5 (5)</td>
<td>420.3 ± 15.5 (5)</td>
<td>133.2 ± 4.3 (5)</td>
<td>441.8 ± 3.9 (5)</td>
<td>6.2 ± 0.8 (5)</td>
<td>136.1 ± 10.1 (5)</td>
<td>5.4 ± 1.2 (6)</td>
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</tr>
<tr>
<td></td>
<td>Zebu</td>
<td>780.6 ± 66.2 (16)</td>
<td>1103.8 ± 190.6 (6)</td>
<td>108.6 ± 16.3 (5)</td>
<td>401.9 ± 64.7 (6)</td>
<td>247.6 ± 26.4 (9)</td>
<td>531.3 ± 73.4 (9)</td>
<td>9.9 ± 2.7 (7)</td>
<td>205.2 ± 49.3 (6)</td>
<td>4.8 ± 0.5 (6)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Seminal plasma</td>
<td>Buffalo</td>
<td>—</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>4.6</td>
<td>44.4 ± 0.4 (5)</td>
</tr>
<tr>
<td></td>
<td>Zebu</td>
<td>—</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>4.3 ± 0.3</td>
<td>43.5 ± 0.19 (5)</td>
</tr>
</tbody>
</table>

The results are expressed as mg/100 ml ± S.E.M.

* The figures in parentheses are the numbers of samples analysed.
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REFERENCES


