THE PRESENCE OF GONADOTROPHINS IN SEMEN OF EGYPTIAN
BUFFALO BULLS

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ABSTRACT

In an attempt to determine the presence of gonadotrophins in semen of farm animals, ejaculates were collected from (12) healthy and sexually mature buffalo bulls. Besides, blood samples were collected from all animals. Serum and seminal plasma were separated by centrifugation. FSH and LH levels were determined using the immunoassay methods. The results revealed that gonadotrophins are present at considerable levels both in semen and seminal plasma.

INTRODUCTION

There is a shortage in buffalo bull population, which is considered as one of the main problems in animal breeding in Egypt. Therefore, in order to face such challenge, it has been necessary to furnish basic information concerning the reproductive pattern, sexual desire and semen characteristics. In this respect, during the last few decades, profuse studies have been carried out to elucidate the physical charac-
ristics and biochemical composition of buffalo bull semen\textsuperscript{1,2,3,4} & 5. However, such studies did not involve the hormonal activity of semen. On the other hand, the estrogenic and androgenic activities of human and bovine semen were reported\textsuperscript{6}. Bearing in mind that FSH and LH regulate the testicular functions and the secretory activities of male accessory organs, the presence of these two hormones in semen is quite possible. It is intended by the present study to determine the presence or absence of gonadotrophins in ejaculated semen of mature buffalo bulls.

**MATERIAL AND METHODS**

Collection of samples:

Semen was collected twice weekly, for (6) weeks from (12) sexually mature buffalo bulls. Soon after collection, each ejaculate was subjected to the routine scheme of semen evaluation. A small part was kept frozen as whole semen and the rest of the ejaculate was centrifuged to separate the seminal plasma which was kept at $-20^\circ$C. A blood sample was collected weekly from each animal, centrifuged and serum was kept at $-20^\circ$C.

Preparation of FSH and LH and their antisera:

FSH and LH were prepared from fresh pituitary glands collected from slaughtered mature buffaloes. The two hormones were prepared and purified according to the methods of Fraenkel-Conrat et al.\textsuperscript{7} and Li et
al. with modification of Aboul-Elahi. FSH and LH antisera were prepared by injecting the hormones in healthy mature male rabbits as outlined by Tadeusz Scgney.

Serum and seminal FSH and LH contents were determined by haemoagglutination inhibition immunoassay according to Wide and Schuurs.

RESULTS

Mean values of ejaculate volume (ml), motility (%) and sperm concentration (X 10^6/ml) are presented in Table (1). There were no significant differences between the two age groups in the ejaculate volume or motility (%). Meanwhile, sperm concentration was significantly (P < 0.01) higher in group B (more than 3 years).

Data presented in Table (2) show that the levels of FSH and LH in serum were several times higher than their levels in whole semen or seminal plasma. It is apparent that FSH and LH increased significantly in the higher age.

DISCUSSION

It is a fact that the reproductive efficiency and testicular potentials improved with the advancement of age towards maturity. Therefore, the higher quality of semen in group B (more than 3 years) is acceptable. However, the values recorded for semen of
TABLE (1): Semen characteristics in buffalo bulls of two age groups

<table>
<thead>
<tr>
<th></th>
<th>Ejaculate Volume (ml)</th>
<th>Motility (%)</th>
<th>Sperm concentration (x 10^6/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group (A):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>less than 3 years</td>
<td>2.50 ± 0.47</td>
<td>64.00 ± 4.58</td>
<td>382.00 ± 50.36</td>
</tr>
<tr>
<td>Group (B)</td>
<td>3.41 ± 0.37</td>
<td>70.46 ± 1.96</td>
<td>755.38 ± 43.77</td>
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<tr>
<td>More than 3 years</td>
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</tbody>
</table>

Mean ± Standard error. **: Significant at (P < 0.01)
TABLE (2): FSH and LH levels (i.u/ml) in serum, whole semen and seminal plasma of buffalo bulls of two age groups.

<table>
<thead>
<tr>
<th></th>
<th>SERUM</th>
<th></th>
<th></th>
<th>WHOLE SEMEN</th>
<th></th>
<th></th>
<th>SEMINAL PLASMA</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FSH</td>
<td>LH</td>
<td>FSH</td>
<td>LH</td>
<td>FSH</td>
<td>LH</td>
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<tr>
<td><strong>Group (A):</strong></td>
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<td></td>
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<td></td>
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<td></td>
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<tr>
<td>less than 3</td>
<td>0.90</td>
<td>0.11</td>
<td>0.07</td>
<td>0.01</td>
<td>0.12</td>
<td>0.01</td>
<td></td>
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<tr>
<td>years</td>
<td>± 0.02</td>
<td>± 0.003</td>
<td>±0.006</td>
<td>± 0.003</td>
<td>±0.008</td>
<td>±0.002</td>
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</tr>
<tr>
<td><strong>Group (B):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>more than 3</td>
<td>1.18</td>
<td>0.12</td>
<td>0.14*</td>
<td>0.03*</td>
<td>0.21*</td>
<td>0.03**</td>
<td></td>
<td></td>
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<tr>
<td>years</td>
<td>± 0.09</td>
<td>± 0.003</td>
<td>± 0.03</td>
<td>± 0.006</td>
<td>±0.03</td>
<td>±0.003</td>
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<tr>
<td><strong>Overall mean</strong></td>
<td></td>
<td>1.04</td>
<td>0.11</td>
<td>0.11⁺</td>
<td>0.03</td>
<td>0.17⁺</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>± 0.06</td>
<td>± 0.003</td>
<td>±0.02</td>
<td>±0.005</td>
<td>±0.02</td>
<td>±0.003</td>
<td></td>
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</tr>
</tbody>
</table>

* : Values within the same column are sign. different at (P < 0.05).
** : Values within the same column are sign. different at (P < 0.005).
a : Overall means having the letter (s) are sign different at (P < 0.05).
bulls in group A (less than 3 years) approach the normal values recorded in previous studies\(^2,3,4\).

Looking through the results presented in Table (2), it can be noticed that the overall means of serum FSH and LH are higher than values recorded in a previous study, El-Azab et al\(^{13}\). This variation can be attributed to the difference in methodology as well as the management. It is clearly obvious that FSH level in serum of older bulls (1.18 ±0.09) was significantly (\(P<0.05\)) higher than its level in young bulls. This finding can explain the significant difference in sperm concentration between the two age groups, Table (1). Meanwhile, the similarity in serum LH levels in the two groups means that androgens production and sexual desire were nearly similar.

It is of interest to note the presence of FSH and LH at considerable levels in whole semen and seminal plasma, Table (2). However, further investigations are in need to clarify what and how gonadotrophins contributed to the ejaculate.

**REFERENCES**


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احتواء السائل النيوي لفحول الجاموس المصري
على الهرمونات الحائطة للغدد التناسلية

شوق سليمان ابراهيم، إبراهيم العلامة، عبد السلام إبراهيم العزب
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قسم بحوث التحليل الصناعي - معهد بحوث التناسليات بالهرمون

استهدفت الدراسة محاولة اثبات وجود الهرمونات الحائطة للغدد
التناسلية في السائل النيوي لفحول الجاموس المصري.

أجرت الدراسة على قذفات منية تم من عدد (12) فحول
جامع جامعة جنوبية وكهلك عينات مثات التي تم تجميعها من نفس
الحيوانات تم تحديد تركيز الهرمونات في السائل النيوي.

السائل النيوي مصل الدم.

ثبتت الدراسة وجود هذه الهرمونات بقدر لا يتأثر في السائل
النيوي وبلازما السائل النيوي لفحول الجاموس المصري.

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