A STUDY ON TESTICULAR FUNCTIONS, SEMEN CHARACTERISTICS AND SEXUAL BEHAVIOUR OF BUFFALO BULLS

By

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Thesis

Submitted in partial fulfilment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in the

POSTGRADUATE INSTITUTE OF AGRICULTURE

of the

UNIVERSITY OF PERADENIYA

SRI LANKA

September 1997.

ABSTRACT

In Experiment-I semen from three Nili-Ravi buffalo bulls was evaluated using standard and modified techniques to study the monthly variation in the seminal parameters. Semen samples (n=132) collected at weekly intervals were examined for volume, colour, density, and sperm concentration, and monthly samples (n=36) were used to study sperm morphology, dead sperms percentage and cells other than sperms. The monthly mean volume of semen ranged from 1.10 ± 0.14 to 7.00 ± 2.16 ml/ejaculate ($\bar{x}$ = 2.94 ± 1.96 ml/ejaculate) and concentration from 607 ±186.01 to 2050 ± 353.44 million/ml ($\bar{x}$ = 1359 ± 420.98 ml/ ejaculate). The colour of semen varied from cloudy to creamy and density range from 2D to 4D. Mass activity and motility of sperms ranged from 2+ to 4+ and 70 to 90 percent respectively. The percentage of dead sperms ranged from 2 to 24 ($\bar{x}$ = 8.19 ± 5.03%). Percentage of head, mid piece and tail abnormalities were 3.31 ± 1.83, 3.16 ± 1.61 and 7.00 ± 4.04 respectively. Desquamated epithelial and spermatogonial cells were found in the ejaculates. Among the seminal parameters, percentages of motility of sperms showed significant monthly variations during January (88%), May (89%) and August (90%).

In Experiment-II monthly variations in the libido score and reaction time were studied in Nili-Ravi bulls. The overall monthly score of bulls was highest during January ($\bar{X}$ = 7.50 ± 0.00 min.) and lowest during September ($\bar{X}$ = 4.22 ± 1.92 min.). During May it was 4.90 ± 1.46 and in the other months it ranged from 5.33 ± 1.15 to 7.28 ± 0.86 min. The Friedman's test indicated that the monthly variation of libido score was significant ($P < 0.05$). From December to February the overall mean reaction time was very short (4.04 to 4.13 min.) and then showed a tendency to increase upto May and then a decline during the month of June (5.83 min.). From June it again increased till September (18.78 min.) and then declined till November (6.92 min.), but was maintained at a higher level than in December. The overall libido score of the bulls fluctuated in a pattern that was opposite to that noted for reaction time. Analysis of variance indicated that the monthly mean difference in reaction times were significant ($P < 0.01$).

In experiment-III the minimum dose of GnRH for the stimulation of testosterone secretion was determined in three indigenous buffalo bulls. Intravenous injections of 10, 50 or 100μg of GnRH were given at weekly intervals. Plasma testosterone levels were measured using RIA technique. The

post treatment mean levels of all the samples of bulls after 10, 50 and 100μg injections of GnRH respectively were 0.25 ± 0.27, 0.87 ± 0.38 and 1.22 ± 0.46 ng/ml. The analysis of variance indicated that the differences between pre and post GnRH testosterone levels were statistically significant ($P < 0.01$). The student's "t" test revealed that the differences between the mean testosterone levels following 10, 50 and 100μg of GnRH injections were significant ($P < 0.01$), but the pre and post testosterone levels following 10μg GnRH injection were not significant ($P > 0.05$).

In Experiment-IV monthly variations in the basal testosterone levels and the stimulatory effect of 50μg of intravenous injections of GnRH on testosterone levels during August (dry month) and December (rainy month) were studied. The overall basal mean testosterone levels of bulls fluctuated through out the study period and showed significant monthly variations ($P < 0.01$) with peaks levels of 0.08 ng/ml and 0.5 ng/ml during August and December respectively.

The pre and post 50μg of GnRH testosterone levels showed fluctuations throughout the study period. The pre-treatment overall mean testosterone levels during August and December were 0.16 ± 0.06 and 0.63 ± 0.40 ng/ml respectively and the mean value during December was higher than in August ($P <$

0.01).

The overall post-treatment mean testosterone levels during August and December were 0.53 ± 0.17 and 1.12 ± 0.30 ng/ml, respectively. The analysis indicated that the post treatment testosterone levels during December was higher than in August ($P < 0.01$).

In Experiment-V monthly variations in the seminiferous tubular diameter and the stages in the seminiferous epithelial cycle during the months of August and December were studied. The mean differences in diameters of the seminiferous tubules in August (177μm) and December (194μm) were significant ($p < 0.01$). In both months stages i to viii of the seminiferous epithelial cycle were noted and the viiith stage of the seminiferous epithelial cycle appeared almost at the same frequency during August (13%) and December (14%).

The experiments revealed that the spermatogenic function of the testes of buffalo bulls was not affected by the environmental conditions prevailing at the experimental area, while the endocrine function showed monthly variation with higher level in December than the other months. Among the seminal characteristics investigated, motility% of sperms showed monthly variation, however throughout the year motility% was maintained above the standard required for AI

work. The sexual behaviour of Nili-Ravi bulls showed monthly variation, though the variation did not affect semen collection from AI bulls throughout the year.