With a view to augmenting rapid development of our cattle wealth which is a national policy, the cross breeding of Indian cattle through the tools of artificial insemination with exotic blood like Holstein and Jersey bulls has been given top priority under different cattle development programmes and semen quantity and quality are considered to be the most important factors in implementing any cattle development programme based on cross breeding.

Semen quantity as well as quality depends upon many variable factors of which libido of a stud bull is one of the most significant criteria. There are various ways by which libido can be increased to a considerable extent in order to have better quality of semen from a bull. It has become a common practice to put the bulls under precollection stimulation by restraining them to induce greater libido culminating in the production of semen of superior quality.

The present experiment was conducted to study the quantity i.e., semen volume and the quality i.e., colour and consistency, pH, initial motility, total count of spermatozoa per ml of semen, live and dead spermatozoa, fructose content of semen (mg) per 100 ml of semen, and abnormal spermatozoa as also the conception rates in female animals inseminated with semen of the bulls exposed to controlled condition of sexual stimuli i.e., unrestrained, one false mount and two false mounts.
Twelve bulls divided into three groups each group comprising four animals were included in the experiment. The first group consisted of four Jersey, the second, four Holstein-Sahiwal Grosses and the third four Sahiwals.

Three levels of sexual stimuli i.e., unrestrained, one false mount and two false mounts were applied to all the three groups of bulls.

Quantitative Study:

The quantitative study (semen volume) showed that the mean volumes of semen for all the three groups of bulls (Jersey, Holstein Cross and Sahiwals) under unrestrained condition were $4.50 \pm 0.15$, $5.40 \pm 0.39$ and $3.86 \pm 0.39$. The corresponding figures under one false mount were $6.28 \pm 0.13$, $6.66 \pm 0.31$ and $5.37 \pm 0.39$ and those of two false mounts $6.90 \pm 0.05$, $6.85 \pm 0.32$ and $5.58 \pm 0.44$ respectively for the above groups of bulls. The results of the experiment showed that there was significantly an increasing trend in semen volume between the bulls as well as between the breeds under two treatments i.e., one false mount and two false mounts from those of unrestrained treatments.

Qualitative Study:

The colour and consistency of semen of the three groups of bulls was observed to have apparently little variations from
thin milky to thin creamy according to the concentration of sperms under three levels of treatments i.e., unrestrained, one false mount and two false mount condition.

The average pH of semen of the three breeds of bulls under unrestrained condition were $6.97 \pm 0.01$, $6.93 \pm 0.01$ and $6.98 \pm 0.02$ for Jersey, Holstein Cross and Sahiwal and the corresponding values under one false mount were $6.77 \pm 0.01$, $6.75 \pm 0.01$ and $6.76 \pm 0.02$ as against $6.77 \pm 0.02$, $6.74 \pm 0.01$ and $6.76 \pm 0.02$ respectively under two false mounts. The pH values of semen of all the breeds showed that the change in pH had a significant effect and shifted more towards acid due to the presence of greater number of motile sperms under the conditions of sexual stimuli in comparison with those of unrestrained condition.

In the case of initial motility of spermatozoa, the average values were $2.87 \pm 0.12$, $3.08 \pm 0.16$ and $3.08 \pm 0.13$ for Jersey, Holstein Cross and Sahiwal under unrestrained condition. Under sexual excitement of one false mount, the corresponding values became $4.37 \pm 0.12$, $4.66 \pm 0.09$ and $4.45 \pm 0.10$ respectively as against $4.41 \pm 0.13$, $4.75 \pm 0.08$ and $4.45 \pm 0.10$ under two false mount condition. There was a trend of increase in the number of motile sperm and the overall average increase in initial motility was 50% taking all the animals and the breeds together showing significant effect of sexual stimuli on the motility of spermatozoa prior to ejaculation.
The mean percentages of live spermatozoa expressed in angle values were found to be \(46.49 \pm 0.87\), \(49.78 \pm 1.30\) and \(49.42 \pm 1.19\) for three groups of animals i.e., Jersey, Holstein Cross and Sahiwal under unrestrained condition. The corresponding figures under one false mount treatment were \(59.50 \pm 1.05\), \(61.10 \pm 0.87\) and \(58.78 \pm 1.05\) and those of two false mount treatment it was \(59.33 \pm 1.25\), \(60.30 \pm 0.88\) and \(60.02 \pm 1.16\) respectively for the same groups of bulls. The percentages of live spermatozoa were also found to have significantly increased due to the effect of sexual excitement as compared with those of unrestrained condition of the bulls.

The total sperm concentration per ml of semen of the three groups of bulls showed the mean values as being \(773.75 \pm 5.95\), \(762.92 \pm 6.33\) and \(709.17 \pm 13.71\) respectively under unrestrained condition. The corresponding figures under one false mount were \(892.92 \pm 22.97\), \(966.67 \pm 4.06\) and \(907.92 \pm 15.93\) as against \(902.08 \pm 20.78\), \(957.08 \pm 5.35\) and \(913.75 \pm 16.97\) under two false mount condition. It was observed that there were significant increases in the number of sperm per ml of semen by exposing the bulls to the different levels of sexual excitement when compared with those of unrestrained conditions of the animals.

In determining the fructose content (mg) per 100 ml of semen of the three breeds of bulls, it was found to be \(515.87 \pm 4.08\), \(509.00 \pm 4.31\) and \(474.08 \pm 9.26\) respectively under
unrestrained condition. The corresponding values under one false mount condition were found to be 394.83 ± 10.32, 426.71 ± 1.79 and 400.17 ± 6.98 as against 399.25 ± 9.37, 423.79 ± 2.61 and 403.08 ± 7.44 respectively for the three breeds of bulls under two false mount condition. It was seen that there was highly significant regressive variation in the fructose content of semen under all conditions which substantiated the fact that the presence of larger proportion of motile sperm in the wake of sexual stimuli caused more fructolysis and consequently lesser amount of fructose as compared with those of unrestrained condition of the bulls.

The percentages of abnormal spermatozoa (mean values) to see the variation, if any, under three levels of sexual stimuli were also determined and expressed in angle values. The abnormalities of spermatozoa were assessed in certain forms namely, (i) Head, (ii) Free loose head, (iii) Middle piece, (iv) Protoplasmic droplet and (v) Tail as also the total abnormalities of the three groups of animals the particulars of which have been furnished under chapter IV (Pages 60-117).

No significant results could be observed in the variation of abnormalities under three levels of stimuli except the variation between bulls and between breeds which were highly significant.
The investigation on the results of conception rates in female animals inseminated with the semen of three groups of bulls under different conditions of sexual stimuli was also conducted. The percentage of conception did not appear to have appreciable improvement or augmentation save and except a very slight variation from unrestrained condition to one false mount and two false mounts imposed upon the bulls.

Semen quality as related to sexual stimuli was also assessed to find out the relationship between the quantitative and qualitative production of semen and sexual excitement. It was found that most of the parameters such as semen volume, pH, initial motility, percentages of live spermatozoa and sperm concentration per ml were markedly influenced and augmented by controlled sexual experiments. Fructose concentration under three treatments had an inverse relationship. Three treatments i.e., unrestrained (A), and one false mount (B), and two false mounts (C) were compared with each other. The treatment means of most of the parameters between A & B and A & C were highly significant while the same between B and C were not significant.

On the whole, the treatment means between A and B (unrestrained and one false mount) and between A & C (unrestrained and two false mounts) in most of the parameters differed significantly at 1% level whilst the treatment means between B and C i.e., between one false mount and two false mounts had insignificant difference revealing no tangible
improvement or augmentation between the treatments, one false mount and two false mounts and naturally, therefore, for the purpose of economy and saving time, the treatment, one false mount (B) may be suggested for adoption as a routine practice in artificial breeding programme.

Since, it was noticed that imposition of sexual stimuli increased the number of motile spermatozoa per unit volume, it might be suggested that the number of sires needed to produce a particular volume of extended semen might be conveniently reduced. Such reductions in the number of sires would certainly go a long way in bringing about an overall economy in any enterprise associated with artificial breeding programme.

For ready reference and perusal, the overall means for different characteristics of semen under different treatments are indicated in Text table 14 (Page-117).