

FROZEN SEMEN PRODUCTION UNDER SINGLE AND DOUBLE EJACULATION REGIMES FOR PUREBRED BULLS

S. Sudheer*, T.P. Aravinth**, Kuruvila Varghese**, C.J. Zavier** and K. Lingam***

KLD Board (Indo-Swiss Project), Mattupatty, Kerala

The number of sperms harvested from any breeding sire will depend on the frequency of ejaculation (number of ejaculates collected weekly) and the amount of sexual preparation provided to the bull before permitting him to ejaculate. Sexual preparation of the bull is possible by permitting false mounts or by active restraining of the bull or a combination of false mounts and restraints prior to semen collection (Almquist, 1973; Almquist and Hale, 1956). The number of ejaculates per collection day and the number of collection days per week for a bull fall under the routine management decisions. The factors which are to be considered in this decision making process include the market demand for semen, the number of available breeding sires and the breeding soundness of the bulls.

There are two accepted regimes for semen collection. Single ejaculation regime - where the bull is brought for collection once in 2 to 3 days and each day only a single ejaculate is collected after giving the bull sufficient sexual preparation for ten minutes.

Double ejaculation regime - where the bull is brought for collection once in 3 to 4 days and each day two ejaculates are collected after giving the bull sexual preparation for 5 minutes. The second ejaculate is collected after an interval of 10 minutes following the first collection.

At the Mattupatty station, double ejaculation regime is being practised. The present investigation was envisaged to undertake a comparative study between the two semen collection regimes in purebred bulls.

Materials and Methods

Six purebred bulls (3 Holsteins and 3 Jerseys) ageing 6 to 8 years of the Mattupatty station were selected for the study taking care that they were in their prime condition having good serving ability and regularly giving semen of good freezability. The bulls were divided into two groups of three each. One group was put to single ejaculation regime and the other under double ejaculation regime for a period of one month after giving the

* Deputy Manager (Frozen semen lab), KLD Board, Kerala

** Assistant Managers (AH), KLD Board, Kerala

*** Manager (AH), KLD Board, Kerala

bulls a pre-experiment period of one month; so that the animals could adapt to the respective regimes. Then the collection regimes were reversed for the groups after giving another pre-experiment period for one month. The study was carried out from July '98 to October '98.

In the single ejaculation regime, the bulls were stimulated by giving three false mounts initially and then by restraining them in the collection yard for 10 minutes followed by the fourth false mount before semen was collected. When one bull was restrained after three false mounts, the other two bulls could be given three false mounts before the former bull was permitted to ejaculate.

In the double ejaculation regime the bulls were given two false mounts prior to collection. After the completion of first collection from the three bulls, the second ejaculate was collected 10 minutes after the first. One false mount was given prior to the collection of second ejaculate.

The ejaculates were subjected to microscopic examination to determine the initial motility under a phase contrast microscope (10x) with a warm stage facility maintained at 38°C. Only those ejaculates giving an initial motility of 60 per cent and above were accepted for further processing. Double ejaculates were evaluated separately, then pooled together and extended. Semen was extended in two

stages with Tris buffer so that each French mini paillet (0.25 cc) contained 24 million sperms. Statistical analysis was carried out as described by Snedecor and Cochran (1988).

Result and Discussion

The time taken for the completion of semen collection was same in both the treatments. The average number of collection days per bull per month was 10.5 and 8.0 for the single and double ejaculation regimes respectively. Similar results were also observed by Mathew (1987) in related studies. At different stages of semen processing (during initial evaluation, after two hour equilibration (test freezing) and 24 hours after final freezing) 12.5 and 5.9 per cent of the ejaculates were rejected in the first and second treatments respectively. The initial motility of the ejaculates and post thaw revival rates were 70.26 ± 13.96 and 51.64 ± 1.87 in the single ejaculation regime as against 70.39 ± 13.52 and 51.7 ± 2.89 in the double ejaculation regime.

The total sperm output obtained in the two treatments are shown in Table. It was observed that the total sperm output per bull per month was 75806.67 ± 10239.91 millions in the first treatment and 88593.33 ± 10659.34 millions in the second treatment, whereas the total freezable sperm output was 69935.83 ± 12617.03 and 85259.17 ± 13536.70 for the

Table. Mean output of semen harvested by the two regimes (per bull per month)

| | I | II |
|------------------------------------|---------------------|---------------------|
| Total output (m ⁶) | 75806.67 ± 10239.91 | 88593.33 ± 10659.34 |
| Freezable output (m ⁶) | 69935.83 ± 12617.03 | 85259.17 ± 13536.70 |
| Doses produced | 2948.33 ± 534.37 | 3527.50 ± 641.55 |
| Sperm output/dose of semen | 25.71 | 25.12 |

single and double ejaculation regimes respectively. Thus the total sperm output and the freezable sperm output were higher in the second treatment in comparison to the first; but the difference was not statistically significant. Mathew (1987) also observed that the total sperm output and the freezable sperm output under the two collection regimes were not significantly different.

The total number of semen doses produced per bull per month was 2948.33 ± 534.37 in the first treatment and 3527.5 ± 641.55 in the second treatment. However, the difference does not reach the significant level. Similar results were also observed by Mathew (1987) in crossbred bulls.

The total sperm output required for the production of each dose of semen was 25.71 and 25.12 million respectively for the two treatments; the difference being insignificant. The present study reveals that both the collection regimes are equally efficient for purebred bulls. However, since the frequency of collection is lower in the

double ejaculation regime as compared to the single; less number of bulls need be brought for collection each day. Hence the semen collection crew can impart better sexual preparation of the individual bull thereby enabling the harvest of the best possible ejaculate. Moreover, if one ejaculate is found substandard during initial evaluation, the other can be processed. But the possibility of accidental/erroneous mixing of ejaculates of different bulls can not be ruled out.

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