SEMEN CHARACTERISTICS AND EVALUATION OF DIFFERENT DILUENTS FOR ARTIFICIAL INSEMINATION IN GOATS

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ABSTRACT

The objectives of this study were to examine the normal semen characteristics including their seasonal variation in the Saanen breed of goats, to evaluate the usefulness of several semen diluents for preservation of goat semen at two different temperatures, and also to evaluate the fertilizing capacity of spermatozoa preserved in the different diluents by subjecting a group of synchronized females to artificial insemination.

Five Saanen bucks were examined over a period of two years for general semen characteristics and for the variations in these characteristics in relation to changes in climatic factors. The mean ($\pm$ S.E.) reaction time (from presentation of the male to time of ejaculation) was 61.12 $\pm$ 3.15 seconds. The average volume of the ejaculate was 1.06 $\pm$ 0.04 ml. The colour density and wave pattern were 3.74 $\pm$ 0.04 and 3.57 $\pm$ 0.04 respectively on a 0-4 scale. The general sperm motility had a mean value of 79 per cent. The sperm count was 5.50 $\pm$ 0.18 x 10^9 per millilitre while the number of spermatozoa per ejaculate was 5.78 $\pm$ 0.3 x 10^9. The dead sperm count and the total number of abnormal forms recorded were 17.70 $\pm$ 0.83 and 5.73 $\pm$ 0.46 per cent respectively. The climatic factors that were measured (temperature, rainfall, relative humidity and hours of sunshine) did not have a significant influence on the above characteristics indicating that there is no seasonal variation in

the quality of semen produced by the Saanen breed of goats in this region of the country. The normal levels of calcium, magnesium, zinc, copper and iron in buck seminal plasma were also measured, and were found to be 5.47 ± 0.23, 5.75 ± 0.14, 1.48 ± 0.10, 0.15 ± 0.01 and 0.11 ± 0.01 mg per 100 ml of seminal plasma respectively.

Four different diluents were evaluated for preservation of goat semen. One was a diluent which is in use for storage of bull semen at room temperature, while the other three (skim milk, egg yolk citrate and glycine egg yolk diluents) were for storage at 4°C. The egg yolk citrate diluent proved to be the best for preservation of motility in goat semen, followed by skim milk and glycine egg yolk diluents in that order. Removing the seminal plasma prior to preservation improved the maintenance of sperm motility when stored in the three diluents at 4°C. The room temperature diluent was observed to be the most inferior in preserving motility of goat spermatozoa.

Two breeding trials were conducted to evaluate the fertilizing capacity of goat spermatozoa preserved in the egg yolk citrate and skim milk diluents. Cloprostenol (an analogue of Prostaglandin $F_{2\alpha}$) given as a single dose in the first trial and in two doses 10 days apart in the second trial, was used for synchronization of oestrus. It was observed that the procedure gave rise to difficulties in

identifying animals which did and did not come into oestrus. Thus, it was necessary to carry out blind or fixed-time inseminations in both trials. The overall conception rates to artificial insemination were very poor in both breeding trials (17.6 and 13.3 per cent respectively). Therefore, it was difficult to draw definite conclusions regarding the best diluent for maintaining high fertilizing capacity of goat spermatozoa.

In the second breeding trial a pregnancy diagnosis test was carried out using an ultrasonic pregnancy detector. The accuracy obtained for positive diagnosis was 98.7 per cent, while that for negative diagnosis was 18.2 per cent. It was also observed that the accuracy for positive diagnosis increased as the stage of gestation advanced.

The findings in the present study indicate the need for further studies in the area of preservation of goat semen. It also highlights the need for better methods of synchronization and for improving the technique of insemination.