STUDY ON SEMEN CHARACTERISTICS OF CHOTTANAGPURI RAMS

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ABSTRACT

The present study was conducted on the semen characteristics of six Chottanagpuri rams. The colour of Chottanagpuri ram semen was found to be creamy or creamy white. The overall mean ejaculate volume, mass-motility, sperm concentration, live sperm percentage and abnormal sperm percentage were found to be 0.648±0.027 ml, 4.222±0.144, 3793±0.134 millions/ml, 83.333±1.318 and 7.034±0.135, respectively. The difference between the ejaculate volume, mass motility, sperm concentration, live sperm percentage and abnormal sperm percentage were found to be non -significant among the rams.

Key Word: Semen, Chottanagpuri rams

Ever since the introduction and development of artificial insemination, semen has been studied very intensively. Various morphological, physiological and biochemical aspects have been investigated, and numerous staining methods have been developed and modified. All these efforts have one common objective, to discover methods enabling determination and prediction of fertility of the male. In India, several studies have been carried out on semen characteristics of native and exotic rams (Sahni and Roy, 1972 ; Sharma et al., 1973 and Johari, 1973). Chottanagpuri sheep is the only recognized breed of sheep in Jharkhand and no work has yet been done to evaluate the physical and biochemical properties of the semen of this breed. The production traits of these local rams may vary and it would be important to study their norms of semen characteristics under local condition.

This study was conducted in the year 2007 between January to May on six adult healthy Chottanagpuri breeding rams. These animals were approximately of the same age group. Six Collection was taken from each ram twice a week in the morning hours by Artificial Vagina method. Estrus ewes were used for collection of semen. Immediately after collection, the semen sample was brought to the laboratory and evaluated for volume, mass motility, sperm concentration, percentage of live and dead spermatozoa and abnormal sperm percentage by standard method. The statistical analysis of the data were done as per Snedecor and Cochran (1989).

The colour of the semen was observed to be creamy or creamy white for all the collections from Chottanagpuri rams. The present observation is by and large in agreement with the findings of Kakadiya *et al.* (1995), Dabas *et al.* (1997) and George *et al.* (2003) who reported that the colour of ram semen varied from milky to creamy or creamy white occasionally with bluish tinge in Malpura, Patanwadi and Garole breeds. The slight variation in colour reported by different workers might be due to seasonal or climatic influences, concentration of spermatozoa per unit volume of semen or due to feeding variations.

The mean ejaculate volume recorded during the present study was 0.648±0.027 ml which varied from 0.508±0.084 to 0.708±0.052 ml. The report on ejaculate volume of Chottanagpuri ram seems to be apparently lacking, but the result recorded during the present study are within normal range and are in consonance with the

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findings of earlier workers (Pareek, 1973 ; Singh *et al.*, 1976) in the case of other native breeds. Nevertheless, higher (Dabas *et al.*, 1997; Ingale *et al.*, 1997; Suthar *et al.*, 1999 ; Pawar, 2003) and lower (Durga *et al.*, 1977 and George *et al.*, 2003) ejaculate volume have also been reported by above workers in indigenous sheep breeds. During the present study there was variation with respect of semen volume among the rams but the differences were not significant, which coincides with the reports of Mehta *et al.*, (1972) and Ihukwumere and Okere (1990).

The differences in ejaculate volume might be due to individual differences in vigour, testicular size, age, body weight, functional status of accessory sex gland and functional disparity and bio-availability of related hormones (Joshi *et al.*, 1999). The difference might also be attributed to breed influence on the activity of seminal vesicle (Salisbury *et al.*, 1978).

The overall mean mass motility of Chottanagpuri ram semen was observed to be 4.222±0.14. No such previous information is available for Chottanagpuri ram, however, the mean mass motility of ram semen obtained in the present study are within the range given by Misra and Sengupta, (1965) and George *et al.*, (2003) in other native breeds sheep. Though higher scores of mass motility than the present findings have been reported by Mehta *et al.*, (1972) and Sharma *et al.* (1973). Lower scores of mass motility have also been reported (Nema, 1994; Suthar *et al.*, 1999 and Pawar, 2003) for different indigenous breeds of ram. Singh *et al.* (1976) and Suthar et al. (1999) observed that there was no significant difference in mass motility scores between rams, which is in consonance with the present finding. Mass activity has been observed to vary with breed, biochemical constituents of semen and presexual stimulation (Salisbury *et al.* 1978).

Sperm concentration

The overall mean sperm concentration per ml of neat semen in Chottanagpuri ram was calculated to be 3793±0.13 millions/ml during the present study. This result is similar to the findings of Mehta *et al.* (1972) in Malpura rams (3760±0.06 millions/ml). However, higher values (Durga *et al.*, 1977 and Sinha *et al.*, 1979) and lower values (Ingale, 1996; Dabas *et al.*, 1997; Ingale *et al.*, 1997; Suthar *et al.*, 1999 and Pawar, 2003) of sperm concentration in other native sheep breeds have also been reported. In the present study , the sperm concentration did not vary between rams, which tallied with the observations of Singh *et al.* (1976) and Kaushish and Sahni (1977). The difference in sperm concentration might be due to climate, nutritional status and frequency of ejaculation and method of semen collection of the rams under different experiments.

Live sperm percentage

The overall mean live sperm percentage was found to be 83.333±1.31 in Chottanagpuri ram semen during the present study. No such comparable data on live sperm percentage in this breed of ram is available, but the result of the present study is in accordance with Singh *et al.*, (1976) and Ingale *et al.*, (1997). Higher values for the attribute however, were reported by Dabas *et al.*, (1997) and Suthar *et al.*, (1999) in different indigenous breeds of ram. Lower values were also recorded by William *et al.*, (1970) and Pawar, (2003) in other native sheep breeds of India. Live sperm percentage has been reported to vary due to feeding variations, environment, breeds of rams and their adaptability in varying agro-climatic conditions of the places of investigations, climate, season and frequency of semen collection (Mittal and Pandey, 1972 ; Pandey *et al.*, 1985).

Abnormal sperm percentage

The overall mean total abnormal sperm percentage in the neat semen of Chottanagpuri rams was estimated to be 7.034±0.13 in the present study. It appears from available literature that contemporary data on the percentage of abnormal sperm in Chottanagpuri ram is not available, but the present study is comparable to the findings of Ingale *et al.* (1997) in Patanwadi rams. Nevertheless, higher values were reported by Dabas *et al.* (1997) and lower values by Durga *et al.*(1977), Nema (1994), Suthar *et al.*(1999) and Pawar (2003) in other

native breeds of India. Agroclimatic influences, differences in methodology or breed difference might be reponsible for the variation in these results (Saxena and Tripathi, 1987).

Thus average values recorded in this study for various seminal attributes in Chottanagpuri rams may be used as physiological norms for this breed in the absence of other published reports.

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