STUDY ON PHYSICAL CHARACTERISTICS OF MEHSANA BUCK SEMEN*

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ABSTRACT

Seventy eight ejaculates from 3 adult Mehsana bucks were collected twice daily with the help of artificial vagina. Creamy semen color was the characteristic feature throughout the study. The average mean values for physical constituents were: ejaculate volume 0.84 ± 0.02 ml, seminal pH 6.82 ± 0.01, mass motility (0-5 scale) 4.03 ± 0.06, individual motility 85.73 ± 0.43 per cent, live sperm count 89.17 ± 0.51 per cent, abnormal sperm count 5.52 ± 0.22 per cent and total sperm concentration 3099.10 ± 59.48 (×10⁶/ml). Overall semen quality of Mehsana breed was found optimum for use in breeding programme.

Key Words : Buck, Physical characteristics, Semen.

INTRODUCTION

Artificial Insemination and use of preserved semen are highly important twin techniques used for upgrading and crossbreeding of the goats. Physical characteristics of semen play an important role in selection of breeding males. It helps in early detection of impaired fertility in males due to poor quality of semen. Literature revealed certain studies on the seminal attributes of some of the indigenous goat breeds (Tiwari et al., 1968 and Mohan et al., 1980), however, such information was scanty in Mehsana breed. So, the study on the semen characteristics of Mehsana buck was carried out.

MATERIALS AND METHODS

The actual work was conducted from November 08 to February 09 and bucks were given ad-lib. green fodder and concentrate at the rate of 250g/animal/day. All 78 ejaculates were collected at twice weekly interval between 7.00 to 8.00 am after washing and cleaning the prepuce. Collection of semen was done with artificial vagina maintaining optimum pressure and temperature of between 41-43°C using sterilized graduated collection cups. All ejaculates obtained from the bucks were evaluated for macroscopic and microscopic semen quality tests. Immediately after collection, volume and colour of semen was recorded in collection cups. The mass motility was observed by placing a small drop of freshly collected neat semen on warm glass slide without cover slip under low magnification (10×) and was graded on 0 to 5 scale as per the procedure of Herman and Madden (1953). The individual progressive motility and percent motile spermatozoa were estimated using a small drop of diluted semen under coverslip on high power objective (40×).

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Live and dead as well as abnormal sperm count were estimated from semen sample by differential eosin-nigrosin staining technique under oil immersion objectives (100×) as per Hancock (1951). The sperm concentration per ml was estimated by Haemocytometer method as per the procedure described by Tomer (1984). The data were analyzed statistically as per the standard procedure described by Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

The results of Mehsana buck semen analysis are described as per the study. Similar to the results of Sahel (Maina et al., 2006) and Surti (Despande, 1989 and Jadav et al., 2008) buck semen was also found to be creamy. However, many authors have reported from white (ivory) to creamy white to slightly yellowish colour of buck semen (Raja and Iyar, 1982; Ali and Mustafa, 1986 and Singh and Raza Nasir, 1995). The colour pattern of the neat semen is the species specific and is also dependent on the sperm concentrations and presence of pigmented proteins and caratinoids in the seminal plasma.

The mean volume of Mehsana buck semen was 0.84 ± 0.02 ml, which ranged between 0.51 to 1.61 ml (Table 1). Almost similar range for the other Indian breeds have also been reported by Mahmood et al. (1988) in Cheghu and Changthangi, Despande (1989) in Surti and Pattnaik et al. (1991) in Ganjam breeds. However, a wide variation in the volume of the neat semen has been reported for exotic breeds viz. Zambian and Boer (Igboeli, 1974), Angora (Sevinc et al., 1985) and Serrana (Barbas et al., 2006). The significant individual variation observed in the present findings are in agreement with the findings of Mahmood et al. (1988), Deshpande (1989), Kale et al. (1998), Barbas et al. (2006) and Jadav et al. (2008) in different goat breeds. Contradictory to the present findings, Biswas et al. (2002) reported the non-significant volume differences between bucks.

The mean pH of Mehsana buck semen recorded in the present study was 6.82 ± 0.02 with a range of 6.5 to 7.2. The earlier studies on Pashmina (Mohan et al., 1980), Cheghu and Changthangi (Mahmood et al., 1988), and Jamnapari, Ajmeri, Osmanabadi goats (Bhuskat et al., 2000) have shown semen pH below 7.0. The studies carried out on Angora (Sevinc et al., 1985) and Surti (Deshpande, 1989) breeds of buck have reported seminal pH in the range of 6.8 to 7.2. However, slightly higher value of 7.15 in Angora bucks has been recorded by Tekin et al. (1996), where semen was collected by electroejaculatory

<table>
<thead>
<tr>
<th>Buck</th>
<th>Volume (ml)</th>
<th>pH</th>
<th>Mass (0-5 scale)</th>
<th>Individual motility (percent)</th>
<th>Live sperm motility (percent)</th>
<th>Abnormal sperm count (percent)</th>
<th>Sperm concentration (10^6/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.89± 0.04a</td>
<td>6.85+ 0.03b</td>
<td>4.04+ 0.10</td>
<td>85.5+ 0.63</td>
<td>88.19+ 0.88a</td>
<td>5.23+ 0.34a</td>
<td>3401.15+ 107.51b</td>
</tr>
<tr>
<td>B</td>
<td>0.89+ 0.05a</td>
<td>6.85+ 0.03b</td>
<td>3.96+ 0.12</td>
<td>84.65+ 0.82</td>
<td>87.77+ 0.70a</td>
<td>6.92+ 0.31a</td>
<td>3053.46+ 97.54a</td>
</tr>
<tr>
<td>C</td>
<td>0.75+ 0.04a</td>
<td>6.77+ 0.02b</td>
<td>4.08+ 0.11</td>
<td>87.04+ 0.75</td>
<td>91.54+ 0.91a</td>
<td>4.42+ 0.34a</td>
<td>2842.69+ 72.52a</td>
</tr>
<tr>
<td>Overall</td>
<td>0.84+ 0.02</td>
<td>6.82+ 0.02</td>
<td>4.03+ 0.06</td>
<td>85.73+ 0.43</td>
<td>89.17+ 0.51</td>
<td>5.53+ 0.22</td>
<td>3099.10+ 59.48</td>
</tr>
</tbody>
</table>

Analysis of Variance

Table 1: Physical and morphological characteristics of semen of Mehsana bucks.

Note: - 1. Superscripts are to be read column-wise.
   2. Means bearing different superscripts differ significantly (P< 0.05).
   3. * significant (P<0.05)** Highly significant (P<0.01) NS  Non significant.
method. The individual bucks had shown an apparent significant variation in the seminal pH. Contrary to these findings, Mahmood et al. (1988) and Deshpande (1989) did not observe significant difference among bucks.

The mass motility of the Mehsana buck semen ranged between the +3 to +5 with a mean of 4.03 ± 0.06. These findings are in agreement with the reports of Mohan et al. (1980) in Pashmina, Pattnaik et al. (1991) in Ganjam, Deshpande (1989) and Jadav et al. (2008) in Surti bucks. However, much lower value of 2.72 ± 0.11 was recorded by Mahmood et al. (1988) in Changthangi breed. Non-significant individual variation found in present investigation corroborated the findings of Deshpande (1989), Biswas et al. (2002) and Jadav et al. (2008). The differences could be attributed to the difference in the breeds and climatic conditions under which experimental animals were reared.

The individual motility percentage in Mehsana buck ranged between 74 to 92 percent keeping the mean of 85.73 ± 0.43 percent. Whereas Mohan et al., (1980) in Pashmina, Pattnaik et al., (1991) in Ganjam and Jadav et al., (2008) in Surti buck semen have reported the individual motility in the range of 60 to 80 percent. Higher individual motility was also exhibited in exotic breed by O’Brien et al.(1966) in Spanish and Ali and Mustafa (1986) in Nubian, Bhuskat et al. (2000) in Ajmeri and Jamnapari and Barbas et al. (2006) in Serrana bucks reported much higher sperm abnormalities. Highly significant variation among bucks for abnormal sperm count found in present study agreed the findings of Despande (1989), Kale et al. (1998), Barbas et al. (2006) and Jadav et al. (2008). Contrary to this study, Mahmood et al. (1988) reported non-significant variation for the same trait among the bucks.

The mean total sperm concentration of Mehsana buck semen was recorded as 3099.10 ± 59.48 millions with a range of 2170 to 4370 millions per ml. The value recorded under the present study was in agreement with those reported for various goat breeds by Mohan et al. (1980) in Pashmina, Sevinc et al. (1985) in Angora and Despande (1989) in Surti. Much higher value of sperm concentration was reported by Barbas et al. (2006) in Serrana buck semen. Contrary to present study, Jadav et al. (2008) found a lower value of sperm concentration per ml in Surti buck semen. The frequency of semen collection (Tiwari et al., 1968), the age of the buck and season (Sinha et al., 1981) affected the sperm concentration in goat.
REFERENCES


