

EFFECT OF SEASON ON FREQUENCY OF EJACULATE DISCARD IN HF CROSSBRED BULLS*

NOOPUR SHRIVATAVA¹, M.K. AWASTHI², A.K. NAIR³, R.P. TIWARI⁴,
M.R. POYAM⁵ AND G.K. MISHRA⁶

Veterinary Gynaecology & Obstetrics Department
College of Veterinary Science & A.H., Anjora, Durg (C.G.)

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ABSTRACT

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The discard frequency of semen ejaculate in six HF crossbred bulls was studied for five calendar years. Data were grouped based on season viz. summer (March to June), rainy (July to October) and winter (November to February) season. A total of 215 (9.00%) ejaculates were discarded out of 2388 semen collections during five years period. Ejaculate discard frequency was 9.87 per cent (55/557) during summer season, while the corresponding values for rainy and winter season were 9.79 per cent (76/776) and 7.96 per cent (84/1055), respectively. There was non-significant difference in ejaculate discard frequency among three seasons. The semen ejaculates were discarded based on lower volume, poor sperm concentration, poor initial motility and post-thaw motility. The highest frequency of discard (47.90%) was recorded for poor sperm concentration followed by poor initial motility (26.04%), poor post-thaw motility (23.72%) and lower volume (2.32%) during summer season. Similar trend was observed during rainy and winter season. Although poor concentration was the main factor for ejaculate discard during winter season; the frequency of poor initial and post-thaw motility was almost similar.

Key words: Crossbred bulls, Season, Ejaculate discard frequency.

Production of quality frozen semen from crossbred (*Bos indicus* × *Bos taurus*) dairy bulls maintained under tropical environment is a serious problem and as many as 60 per cent of crossbred bulls are rejected from frozen semen production stations because of poor semen quality, higher sperm abnormality and poor semen freezability (Tyagi *et al.*, 2006; Mandal *et al.*, 2010). Investigation on the occurrence of non-freezable ejaculates and their discard rate during different seasons is important for effective utilization of germplasm (Kanchan *et al.*, 2010). However, little information is

available on frequency of ejaculate discard in crossbred bulls during different seasons in tropical area. In perspective, the present investigation was conducted on discard rates of ejaculates during summer, rainy and winter seasons in crossbred bulls.

The investigation was conducted using collection records of six HF crossbred bulls maintained at Central Semen Station Anjora, Durg (C.G.). The bulls were maintained in identical feeding and management regimes according to minimum standard protocol (MSP) of Government of India. Semen was collected twice per week from each bull using an artificial vagina. Semen was diluted in Tris–yolk–citric acid–fructose–glycerol (7.0%) dilutor to contain 20 million spermatozoa per dose in French mini straw (0.25 ml). After equilibration of 4 hrs at 4°C, cryopreservation of semen was carried out in liquid nitrogen vapours using Programmable Bio freezer (Digit Cool 5300, IMV, France) and stored in liquid nitrogen. Post-thaw motility was checked 24 hrs

* Part of MVSc Thesis Research

¹Post-graduate student,

²Professor and corresponding author, E-mail:
awasthimk1963@rediffmail.com

³ Veterinary Asstt. Surgeon, Central Semen Station,
Livestock Development Deptt.,

⁴ Professor & Head

^{5,6} Assistant Professor

after semen freezing. The discard frequency of semen ejaculate was studied for five calendar years i.e. from 2007 to 2011. The record of all semen collections of 5 years period was screened and data were grouped based on season viz. summer (March to June), rainy (July to October) and winter (November to February) seasons. The semen ejaculate was discarded, if sample had volume less than 1 ml; initial motility less than 70 per cent; sperm concentration less than 500 million/ml and post-thaw motility less than 50 per cent. Discard frequency of semen was calculated in terms of percentage. Effect of season on ejaculate discard was analyzed using χ^2 test of dependence (Snedecor and Cochran, 1976). A total of 55 ejaculates were discarded out of 557 collections during summer season with a frequency of 9.87 per cent. The corresponding values for rainy and winter seasons were 9.79 per cent (76/776) and 7.96 per cent (84/1055), respectively. Thus, overall 215 (9.00%) ejaculates were discarded out of 2388 collections made over 5 years period. There was non-significant difference in ejaculate discard frequency among three seasons.

The highest frequency of semen ejaculate discard was observed for poor sperm concentration (47.90%), followed by initial motility (26.04%), post-thaw motility (23.72%) and ejaculate volume (2.32%). The poor sperm concentration was the main factor responsible for ejaculate discard during all three seasons followed by initial motility, post-thaw motility and the volume. The frequency of ejaculate discard due to initial motility and post-thaw motility was almost similar during winter season (21.42% and 22.61%). The present finding is in agreement with the observation of Fonseca *et al.* (1992) who suggested that seasonal influence on seminal parameters of bull is negligible. Similarly, Taylor *et al.* (1985) demonstrated that extreme temperatures had only small effects on sperm production resulting in small decrease in semen volume and in concentration. Fiaz *et al.* (2010) and Chauhan *et al.* (2010) reported that season had no significant effect on production of freezable ejaculates in HF and HF crossbred bulls. Many workers reported that volume of semen does not differ with season (Hussain *et al.*, 1985; Sarder *et al.*, 2000). However, better ejaculate quality has been reported

during favourable season (Andrabi *et al.*, 2002). The frequency of ejaculate discard ranged from 7.96 to 9.87 per cent among three seasons in present study, which is much lesser than earlier reports (Mathew *et al.*, 1982; Usmani *et al.*, 1993) that recorded 39.80 and 33.7 to 50.1 per cent ejaculate discard in HF crossbred bulls.

An attempt was made to study the factors responsible for ejaculate discard in HF crossbred bulls in present work. Among different factors, poor concentration of spermatozoa in the semen recorded the highest frequency in all the three seasons. The second factor responsible for ejaculate discard was poor initial motility, the frequency of which was highest during rainy season. Similarly, the frequency of poor post-thaw motility as a cause of ejaculate discard was highest during rainy season. Frequency of less volume as a cause of ejaculate discard was much less (2.32%). For effective utilization of superior germplasm it is necessary that the ejaculate discard rate must be at minimum level. In the present study, the ejaculate discard frequency was about 8 to 10% in all seasons, which is much lesser than early report in HF crossbred bulls (Mathew *et al.*, 1982 and Usmani *et al.*, 1993). It seems that frequency of ejaculate discard recorded in present study is inevitable. From the present findings, it may be concluded that the season has no direct influence on frequency of ejaculate discard in HF crossbred bulls based on volume, initial motility, sperm concentration and post-thaw motility. Poor concentration of spermatozoa in the semen is the main factor responsible for ejaculate discard in HF crossbred bulls.

REFERENCES

- Andrabi, S.M.H., Naheed, S., Khan, L.A. and Ullah, N. (2002). Semen characteristics of crossbred (Friesian x Sahiwal) bulls at Livestock Research Station, National Agricultural Research Center, Islamabad. *Pakistan Vet. J.*, **22** (4): 181-187.
- Chauhan, I.S., Gupta, A.K., Khate, K., Chauhan, A., Rao, T.K., Pathak, S., Hazra, R. and Singh, M. (2010). Genetic and non-genetic factors affecting semen production traits in Karan Fries crossbred bulls. *Trop. Anim. Health Prod.*, **42** (8): 1809-15.

- Fiaz, M., Usmani, R.H., Abdullah, M. and Ahmed, T. (2010). Evaluation of semen quality of Holstein Friesian and Jersey bulls maintained under subtropical environment. *Pakistan Vet. J.*, **30** (2): 75-78.
- Fonseca V. O., Crudeli G. A, Silva E.V and Hermanny A.T. (1992). Effect of season on semen traits and scrotal circumference of Nelore bulls. *Med. Vet. Zootecnia*, **44**: 7-15.
- Hussain, S.S., Ahmed, A., Mostafa, K.G. and Bhuiyan, A.K.F.H. (1985). Effect of season on semen characteristics of crossbred bulls under field conditions. *Bangladesh J. Anim. Sci.*, **14**: 18-22.
- Kanchan, Matharoo, J.S. and Jain, A.K. (2010): Effect of seasonal variations on the frequency of static ejaculates and discard rate in Murrah buffalo bulls. *Proc. XXVI Annual convention of ISSAR, Pantnagar*, November 10-12, p. 12.
- Mandal, D.K., Kumar, M. and Tyagi, S. (2010): Effect of age on spermogram of Holstein Friesian × Sahiwal crossbred bulls. *Animal*, **4** (4):595-603.
- Mathew, A., Joseph, P.J. and Jose, T.K. (1982). Semen characteristics of purebred and cross-bred bulls. *Indian Vet. J.*, **59**: 364-367.
- Sarder, M. J. U., Joarder, O. I., Ali, M. S. and Imam, M.H. (2000). Influence of genetic group, season and age on semen characteristics of breeding bulls. *Bangladesh J. Genet. Biotechnol.*, **2**: 35-42.
- Snedecor, G.W. and Cochran, W.G. (1976). *Statistical Method*. 8th edition, Oxford and IBH publication Co. Calcutta.
- Taylor, J.F., Bean, B., Marshall, C.E., Sullivan, J.J. (1985). Genetic and environmental components of semen production traits of artificial insemination Holstein bulls. *J. Dairy Sci.*, **68**: 2703-2722.
- Tyagi, S., Mandal, D.K., Kumar, M. and Mathur, A.K. (2006). Reproductive wastage rate of crossbred dairy bulls with reference to level of exotic inheritance and number of breed components. *Indian J. Anim. Reprod.*, **27**: 27-30.
- Usmani, R.H., Shah, S.K. and Zafar, A.H. (1993). Seasonal effect on semen producing ability of Holstein Friesian and crossbred bulls under subtropical environments of Punjab. *Pakistan Vet. J.*, **13**: 133-37.