The Indian Journal of Animal Reproduction: 23(2): 177 - 178; December 2002

Short Communication

Assessment of static ejaculates of buffalo bulls for freezing and polyacrylamide gel migration

SATWINDER SINGH[1], G.R. PANGAONKAR[2], J. S. MATHAROO[3] AND RAKESH SHARMA[4]

Punjab Agricultral University, Ludhiana - 141 004

Received : February 17, 2001
Accepted : February 7, 2002

ABSTRACT

Study was conducted on assessment of static ejaculates of buffalo bull semen for freezing. The results revealed significantly reduced freezing and PAG migration of static ejaculates.

Key words : Static ejaculate, polyacrylamide gel migration, semen, spermatozoa, buffalo bull

Occasionally, buffalo bulls donate initially non-motile static or 'zero' ejaculates. The non-motile characterisitic of such ejaculates has been attributed to the presence of either spermiostatic factor, motility inhibiting factor or absence of forward motility proteins (Agarwal and Tomar 1998). These static ejaculates were previously discarded although about 2/3rd of them regain motility when mixed in extender and can be frozen successfully (Dhami *et al.* 1995 and Jindal *et al.* 1996). This investigation was undertaken to study the quality of static ejaculates for freezing and polyacrylamide gel column migration in comparison with non-static ejaculates of buffalo bulls.

Semen samples (32) were collected from four buffalo bulls maintained at Livestock Farm, Punjab Agricultral University, Ludhiana. These ejaculates (8 from each bull including 4 static and 4 non-static) were extended using Tris egg yolk glycerol extender and were examined for initial sperm motility, normal sperm count, live sperm count and spermatozoal penetrability through 2 % polyacrylamide gel (PAG) column (Lorton *et al.*, 1981). Thereafter semen aliquots were subjected to freezability test, viz. post thaw motility and penetrability of post-thawed sperms through PAG column.

Static semen samples after dilution showed significantly ($p<0.05$) lower initial motility, livability, normal sperm count and sperm penetration distance (SPD) through PAG column as compared to motile semen samples (Table-1). Further Kumar *et al.* (1993) and Dhami *et al.* (1995) also reported significantly lower values of physical characteristics for static semen samples. The difference in spermatozoal penetrability might be due to more number of progressively motile spermatozoa in the non-static semen as compared to static

Table 1. Initial seminal characteristics and sperm penetration distance (SPD) of non-static and static ejaculates (extended in tris yolk) of buffalo bulls

Parameters	Non-static ejaculates (n=16)	Static ejaculates (n=16)	t-value
Initial sperm motility (%)	68.12 ± 1.07	60.93 ± 1.18	4.78*
Live sperm count (%)	79.75 ± 1.18	75.00 ± 0.86	3.30*
Normal sperm count (%)	83.18 ± 0.65	79.37 ± 0.73	3.91*
SPD value (mm/20 min)	21.49 ± 0.22	19.96 ± 0.27	4.27*

* ($P < 0.05$)

[1]Veterinary Officer, Punjab State, Punjab,
Corresponding author -[2]Professor, Deptt. of Animal Reproduction, Gynaecology & Obstetrics, PAU, Ludhiana, [3]Professor & Head, Deptt. of Vety. Biochemistry, PAU, Ludhiana and [4] Assistant Professor, Deptt. of Vety. & A.H. Extension, PAU, Ludhiana.

semen, which is significantly correlated with sperm penetrability in PAG column (Goldstein *et al.* 1982). The post thaw motility recorded as 45.63 ± 0.97 and 39.06 ± 0.65 per cent ($P<0.05$) for non-static and static ejaculates, respectively, which substantiated the work of Nainar *et al.* (1990) and Jindal *et al.* (1996). The overall mean SPD values recorded for post thawed semen of non-static and static ejaculates (19.09 ± 0.11 and 18.61 ± 0.08 mm/20 min.), also differed significantly ($p<0.05$).

The results indicated significantly reduced freezability and PAG migration of static ejaculates. However, its freezability was high enough to pass the standards set for the usage of frozen semen (Nainar *et al.* 1990). It is opined that though static ejaculates may get discarded on the basis of physical characteristics (specially non-motile spermatozoa), but are capable of gaining motility after dilution and could be frozen successfully though not to the extent of normal semen (Jindal *et al.* 1996). Moreover, the PAG migration appears to be the deciding test for freezability or discard of semen samples with static sperms, as there was a significant positive correlation among them.

REFERENCES

Agarwal, S.K. and Tomar, O.S. (1998). Reproductive technologies in buffaloes. Indian Veterinary Research Institute, Izatnagar, U.P. pp 33.

Dhami, A.J., Greesh, M. and Sahni, K.L. (1995). Seminal LDH and Trace elements profile in the static versus motile ejaculates of Friesian and Murrah buffalo bulls. Int. J. Anim. Sci., **10**(1) : 151-56.

Goldstein, M.C., Wix, L.S., Foote, R.H., Feldschuh, R. and Feldschuh, J. (1982). Migration of fresh and Cryopreserved human spermatozoa in polyacrylamide gel. Fertil. Steril., 37: 668.

Jindal, S.K., Hooda, O.K. and Jain, G.C. (1996). Studies on the occurrence and freezability of static ejaculates in buffalo bulls. Indin J. Anim. Reprod., **17**(1) : 50-51.

Kumar, S., Sahni, K.L. and Bishta, G.S. (1993). Correlation studies among various seminal Characteristics of motile and static ejaculates of Murrah bulls. Indian J. Dairy Sci., **46**: 223-25.

Lorton, S.P., Kummerfeld, H.I. and Foote, R.H. (1981). polyacrylamide as a substitute for cervical mucus in sperm migration tests. Fertil. Steril., **35**: 222-25.

Nainar, A.M., Easwaran, B.M. and Ulaganathan (1990). Studies on non-motile spermatozoa (static semen) in buffalo bull semen. *Indian Vet. J.*, **67**: 133-36.