

Seasonal effects on seminal attributes in Murrah bulls under Bangalore agroclimatic conditions*

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Received : June 20, 2002

Accepted : October 8, 2003

ABSTRACT

The present study was undertaken to know the seasonal influence on various seminal attributes, in Murrah bulls. Data included 4,446 ejaculates over a period of 7 years. The seminal volume, mass activity and number of semen straws produced were significantly high ($P < 0.05$) during monsoon. The sperm concentration was highest (943.77 ± 22.02 106/ml.) in summer. The initial motility and post thaw motility were not affected by different seasons. Monsoon season was most favourable for production of quality semen, followed by summer and winter.

Key words: Semen, seminal attributes, Murrah bulls

In farm-animals though the spermatogenetic activity is a continuous process with the attainment of puberty, many investigations have shown that the quality and quantity of semen may vary during different seasons of the year. In buffalo bulls the much literature is still lacking and also the variable results may be particularly due to different climatic conditions under which the experiments were carried out.

The knowledge of trend of seasonal influence on semen characteristics would help to know requirement of bulls to meet the demand for frozen semen and to provide any suitable additional managerial requirements time to time. Hence, the present study was undertaken to know the seasonal influence on seminal attributes in Murrah bulls under the agro-climatic conditions of Bangalore.

MATERIALS AND METHODS

The recorded data on semen production of seven Murrah bulls for seven years (Jan 93 to Dec 99) were utilized in the present study. The bulls were kept under uniform managerial and dietary regime at Central Frozen Semen Production and Training Institute. They were in good health with sex desire and ability and were trained to ejaculate on artificial vagina.

In order to estimate the variations on semen quality and quantity the observations of each sample for its volume, mass-activity, consistency, progressive motility, post thaw motility and number of straws per collection (0.5 ml French

medium) were made. To study the effect of season the information on 4446 ejaculates (number of samples available during the period) were sub-clustered under four groups namely winter (Jan-Feb), summer (March-May), south-west monsoon (June-Sept) and north-east monsoon (Oct-Dec). The data were analysed using the least square analysis of variance.

RESULTS AND DISCUSSION

Semen volume : The significantly lowest mean ejaculate volume of 2.97 ± 0.04 ml recorded during summer in the present study is strongly supported by Misra and Sen Gupta (1965) Singh and Mishra (1975) Bhattacharya *et al.* (1978), Gupta *et al.* (1978) and Ganguli (1988). The highest mean volume of semen was 3.13 ± 0.04 recorded during north-east monsoon and is in agreement with Madhukar Bhosrekar (1980) and Hosamani and Basavaiah (1986).

Mass activity : The seasonal effect on mass activity was significant and highest mass activity (2.51 ± 0.02) was recorded in south-west monsoon followed by summer (2.48 ± 0.02) and winter (2.43 ± 0.03). Earlier Madhukar Bhosrekar (1980) reported similar results but Sagdeo *et al.* (1991) made contradictory report of highest mass activity during summer and lowest in winter season.

Sperm concentration : In the present study the mean sperm concentration during summer was significantly highest (1027.24 ± 20.28 millions/ml) which is in agreement with earlier findings of Oloufa *et al.* (1959), Bhattacharya *et al.* (1978) and Dhami *et al.* (1998). However, Narasimha Rao and Sreemannarayana (1996) reported higher sperm concentration during spring.

*Part of M.V.Sc. Thesis submitted to UAS, Bangalore by first author.

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Table 1. Spermogram and straws (semen doses) obtained per collection in Murrah bulls, during different seasons

Season	Seminal traits					
	Volume (ml)	Mass activity (0-+5)	Concentration (106/ml)	Initial motility (%)	PTM (%)	Straws produced (Nos.)
Winter	3.00±0.06 ^{ab}	2.43±0.03 ^{ab}	943.77±22.02 ^a	65.28±1.1 ^a	42.30±1.22 ^a	135.57±6.31 ^a
Summer	2.97±0.04 ^a	2.48±0.02 ^b	1027.24±20.28 ^b	65.54±1.07 ^a	42.30±1.17 ^a	147.44±6.09 ^b
S-W monsoon	3.06±0.04 ^{ab}	2.51±0.02 ^b	1009.32±18.08 ^b	66.75±1.08 ^a	41.34±1.20 ^a	147.17±6.19 ^b
N-E monsoon	3.13±0.04 ^b	2.35±0.02 ^a	1026.13±18.45 ^b	65.87±1.09 ^a	41.78±1.22 ^a	148.34±6.29 ^b
Overall	3.01±0.01	2.46±0.01	952.35±6.79	64.13±0.24	42.09±0.27	147.41±1.40

Note Means bearing any one common superscript do not differ significantly ($P < 0.05$)

Progressive motility : Present study revealed no significant effect on progressive motility. However, highest progressive motility of 66.75±1.08 was observed during south-west monsoon which is supported by earlier works of Gupta *et al.* (1978). Narasimha Rao and Sreemannarayana (1996) and Dhami *et al.* (1998) also reported non-significant seasonal impact on progressive motility.

Post thaw motility : Present study depicted non-significant impact of seasons on post thaw motility. However, the mean per cent post thaw motility during winter (42.30±1.22) and summer (42.30±1.17) were relatively higher, when compared to monsoon season. This observation is in agreement with the reports of Sagdeo *et al.* (1991).

Semen doses (straws) produced : The mean semen straws produced per collection varied significantly between seasons. The semen straws produced during north-east monsoon was highest (148.34±6.29) while it was lowest (135.57±6.31) during winter season. Contrary to present findings Singh *et al.* (1994) and Narasimha Rao and Sreemannarayana (1996) reported winter, as more favorable season for more semen production.

This study was conducted to know the effect of seasons namely winter, summer, south-west monsoon and north-east monsoon on seminal attributes like volume, progressive motility, mass activity, post thaw motility, sperm concentration and number of semen straws produced in Murrah bulls. The influence of season on semen volume, mass activity and number of straws produced was significantly higher ($P < 0.05$) during monsoon. The sperm concentration was highest in summer. The effect of seasons on progressive motility and post thaw motility was non-significant. The study concludes that monsoon season is most favourable for production of quality semen follows by summer and winter.

ACKNOWLEDGEMENT

The authors are thankful to the Joint Commissioner (CBF) Govt of India, for providing facilities from CFSP and TI,

Indian J. Anim. Reprod., 25(1), June 2004

Hessaraghatta, Bangalore 560 088. The officers of the Central Frozen Semen Production and Training Institute are acknowledged for timely support and encouragement.

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