



Quantification of sexual behaviour traits in presence of teaser male in relation to libido and semen quality in crossbred (HF × Sahiwal) bulls

KHUSHPREET SINGH*, AJEET KUMAR, M HONPARKHE and P S BRAR

Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab 141 004 India

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Artificial insemination (AI) is a widely used biotechnique for the dissemination of outstanding germplasm in India. To produce good quality semen, high fertility bulls are selected and semen is collected, processed and frozen. The identification of high fertility bull is a major challenge. Breeding buffalo bulls can be demarcated for high libido based on quantification of sexual behaviour traits in relation to semen picture (Singh *et al.* 2019).

However, the sexual behaviour traits in presence of teaser bull have not been quantified in crossbred (HF × Sahiwal) bulls till now. Therefore, present study was conducted to quantify the sexual behavior traits of crossbred (HF × Sahiwal) bulls in presence of male teaser in relation to libido and semen quality.

The present study was conducted on 29 breeding crossbred (HF×Sahiwal) bulls between 5–10 years of age, being maintained loosely in half walled concrete sheds in individual pens (covered area 12 × 10 ft and uncovered area 25 × 10 ft) at bull station, Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana, India (Latitude/Longitude, 30.55°N, 75.54° E) and Sperm station (MilkFed), Bhattian, Khanna, Punjab (30.7071° N, 76.2170° E). Three false mounts were given before semen collection and later semen was collected using artificial vaginal method. A videography (Sony Handycam, HDR CX-240) of complete semen collection procedure was conducted right from first exposure to sexual stimuli in semen collection area until ejaculation. The video signals were then transferred to a computer and video streamings were analysed (Windows 10, Movie Maker Software) for different sexual behaviour traits with respect to time elapsed.

Reaction time was calculated by analysing the video streamings as time from first exposure of sexual stimuli until ejaculation. Bulls were categorized as high libido (Group 1, N=19, reaction time < 5 min) and low libido (Group 2, N=10, reaction time > 5 min). For the comparative quantification of sexual behaviour traits in both the groups, 10 bulls from Group 1 (random selection) and all the bulls from Group 2 were selected. Sexual behaviour traits, viz. reaction time, duration of first licking of perennial

area, frequency of licking of perennial area until ejaculation, overall average licking duration of perennial area, average duration of flehmen response following sniffing and licking the perennial area and resting of the chin on the back of teaser bull after ejaculation were analyzed from video streaming recorded earlier.

Soon after the semen collection, ejaculate was placed in a water bath at 35°C. Semen was evaluated for volume, mass activity, individual motility, progressive motility, sperm viability and total sperm abnormalities. Semen was diluted in Tris Egg yolk extender and straws were filled, sealed and kept at 4°C for 4 h for equilibration. Then, the straws were frozen at ultralow temperature using vapour freezing method. Retrospective analysis of data was done to calculate the discard rate of frozen semen as the proportion of frozen semen below the acceptable post thaw motility (>50%) subjected to cryopreservation. Data were analysed using students ‘t’ test. The data was presented as mean±SE. The significant interaction was considered at P<0.05.

In the present study, quantification of the sexual behaviour traits exhibited by breeding crossbred (HF × Sahiwal) bulls in presence of a teaser buffalo bull was

Table 1. Sexual behaviour traits exhibited in high and low libido crossbred bulls

Trait	High libido bulls (N=10)	Low libido bulls (N=10)
Duration of first licking of perennial area (sec)	6.5±0.34*	11.3±0.62
Frequency of licking of perennial area until ejaculation.	1.8±0.20*	3.1±0.98
Overall average licking duration of perennial area (sec)	9.9±0.93*	20.4±0.72
Average duration of flehmen response following sniffing and licking the perennial area (sec)	5.1±0.18	5.3±0.30
Resting of the chin on the back of teaser bull after ejaculation (sec)	2.2±0.20*	2.9±0.23

*Corresponding author e-mail: khushpreet693@gmail.com

*indicates significantly (P<0.05) lower values.

Table 2. Fresh semen quality traits in relation to libido in crossbred bulls

Crossbred bulls	Reaction time (Min)	Individual sperm motility (%)	Sperm viability (%)	Total sperm abnormalities (%)	Frozen semen discard rate (%)
High libido	3.25±0.29	90.21±4.31*	85.64±6.21*	15.23±3.51	8.62±0.25
Low libido	6.52±0.16	75.81±5.13	68.57±5.31	13.61±3.71	11.94±0.32

*Indicates significantly ($P < 0.05$) higher values.

carried out. The data on sexual behaviour traits were analysed and presented in Table 1. Our study revealed that sniffing and licking of perineal area of teaser male was observed as the first trait in both high and low libido crossbred bulls, followed by nudging and protrusion of penis. The average duration of first licking of perineal area in high libido bulls was significantly ($P < 0.05$) lower as compared to that in low libido bulls. Crossbred bulls showed less frequency of licking penis and prepuccial area of the dummy bull. The licking of penis and prepuccial area of the dummy bull was 30% (3 out of 10) in low libido bulls as compared to 10% (1 out of 10) in high libido bulls. Sniffing and licking of urine voided by dummy bull was rarely observed (1 out of 20 high and low libido bulls) in crossbred bulls. Licking and sniffing of the perineal area was the most observed sexual trait in crossbred bulls. Crossbred bulls sniffed and licked perineal area of teaser bull a number of times. The average frequency of licking of perineal area until ejaculation in high libido crossbred bulls was significantly ($P < 0.05$) lower as compared to low libido bulls. The overall average duration of sniffing and licking of perineal area in high libido bulls was significantly ($P < 0.05$) lower as compared to low libido crossbred bulls. A peculiar trait of licking from perineal area to the flank has been observed in 40% (4 out of 10) in low libido bulls as compared to 20% (2 out of 10) in high libido bulls. The average duration of flehmen response following sniffing and licking the perineal area of teaser male was similar ($P > 0.05$) in high and low libido crossbred bulls. Before mounting, breeding crossbred bulls sniffed the perineal area again followed by resting of chin on rump of teaser male immediately after ejaculation. The average chin resting time was significantly ($P < 0.05$) lower in high libido bulls as compared to low libido bulls. It was also observed that low libido bulls showed poor interest in presence of restrained teaser bull. However, free movement of teaser bull helped in improved sexual excitement in low libido bulls under similar conditions. Whistling by the bull handler and watching other bulls during semen collection led to increased sexual interest and hastened semen collection in low libido bulls.

Limited information pertaining to sexual behaviour traits of crossbred bulls (HF × Sahiwal) is available. Singh *et al.* (2019) reported sniffing and licking of prepuccial area and licking of urine voided by teaser bull as the specific sexual trait in breeding buffalo bulls. Singh *et al.* (2019) also reported that average chin resting time were similar

($P > 0.05$) in high and low libido buffalo bulls. Singh *et al.* (2014) reported a significantly high positive correlation between sexual aggressiveness and penile protrusion, libido and mating ability. After approaching teaser sniffing (38.19%), licking (36.11%) and flehmen posture (43.5%) was observed in Kundhi buffalo bulls (Samo *et al.* 2005). Chin resting (14.68%) and dismounting time from 5 to 15 sec was reported (Samo *et al.* 2005). Significant negative correlation of reaction time and total time taken in mounts with libido and sexual behaviour score was found by Singh *et al.* (2015).

Data on semen evaluation parameters were analysed and are presented in Table 2. In our study, individual sperm motility (%) was significantly higher ($P < 0.05$) in high than low libido crossbred (HF × Sahiwal) bulls. Similar observation was also reported by Kumar *et al.* (2008). So, high individual sperm motility is indicative of high libido bulls and can be used to demarcate low libido crossbred bulls, though libido is a multifactorial trait. Viability (%) of sperms were significantly higher ($P < 0.05$) in high as compared to low libido bulls. It had been found that positive correlation exist between reaction time and viability of sperms (Shukla and Mishra 2005). So, better the viability, higher is the libido in crossbred bulls. Abnormality (%) of sperms was similar ($P > 0.05$) in high and low libido bulls. The frozen semen discard rate in low libido crossbred bulls was non-significantly higher ($P > 0.05$) as compared to high libido crossbred bulls. Similar observations for viability and freezability of semen in good and poor libido bulls were also reported by Kumar *et al.* (2008). Relationship between libido and seminal characteristics is a useful index for the selection of the males (Moghaddam *et al.* 2012).

High libido crossbred (HF × Sahiwal) bulls display almost all the sexual behaviour traits for less duration than the low libido bulls. Fresh semen quality parameters were significantly better in high libido bulls. No significant differences were observed in abnormality (%) and discard rate of frozen semen between the high and low libido crossbred bulls. Therefore, it can be concluded that crossbred bulls can be demarcated for high libido based on based on quantification of sexual behaviour traits in relation to semen picture.

SUMMARY

The present study was conducted to quantify the sexual behaviour traits of crossbred (HF × Sahiwal) bulls in presence of male teaser in relation to libido and semen

quality. The average duration of first licking of perineal area, average frequency and overall average duration of licking of perineal area until ejaculation in high libido bulls were significantly ($P < 0.05$) lower as compared to low libido bulls. Individual sperm motility (%) and viability (%) was significantly higher ($P < 0.05$) in high than the low libido bulls. Therefore, breeding crossbred bulls can be demarcated for high libido based on based on quantification of sexual behaviour traits in relation to semen picture.

REFERENCES

- Kumar A, Singh J, Dhaliwal G S and Singh P. 2008. Incidence and factors associated with poor libido in breeding buffalo bulls. *Indian Journal of Animal Sciences* **78**: 143–45.
- Moghaddam G, Pourseif M M and Rahimi A A R. 2012. Study of correlation between reaction time and refractory period (as indices of libido) with semen characteristics in Arkhar Merino \times Moghani and Baluchi \times Moghani rams. *Italian Journal of Animal Science* **11**: 363–67.
- Samo M U, Brohi N A, Kaka I, Qureshi T A and Memon M M. 2005. Study on sexual behaviour and seminal quality characteristics of Kundi buffalo bulls. *Pakistan Journal of Biological Science* **8**(11): 1628–29.
- Singh S, Bhakat M, Mohanty T K, Chakravarty A K, Gupta A K, Singh P, Kumar A and Kumar R. 2015. Relationship between sexual behaviour and seminal attributes of young Sahiwal bulls. *Indian Journal of Dairy Science* **68**(3): 266–70.
- Singh S, Bhakat M, Mohanty T K, Kumar A, Gupta A K, Chakravarty A K and Singh P. 2014. Sexual behavior and its relationship with semen quality parameters in Sahiwal breeding bulls. *Veterinary World* **8**(6): 745–49.
- Singh K, Kumar A, Honparkhe M and Singh A K. 2019. Quantification of sexual behaviour traits in presence of teaser male in relation to libido and semen quality in buffalo bulls. *Journal of Animal Research* **9**(1): 143–46.
- Shukla M S and Mishra A K. 2005. Correlation between seminal characteristics in Murrah bulls. *Indian Journal of Animal Sciences* **75**: 263–66.