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SHORT COMMUNICATION

Effect of foot and mouth disease vaccination on the reproductive capacity of the buffalo bulls

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ABSTRACT

The bulls which are used in Artificial Insemination should be maintained in disease free areas to prevent disease transmission. Vaccination is routinely done against bacterial and viral diseases. Vaccination is considered as a stress factor which affects the semen quality. Hence the present study was undertaken to observe the effect of FMD vaccination on the reproductive capacity of buffalo bulls, which can alter the spermiogram and ultimately the conception.

Key words: FMD, Vaccination, buffalo, bull, reproduction.

Artificial Insemination is being extensively used in India. It is desirable that bulls kept for the AI purpose should be maintained in disease free areas to prevent spreading of disease. To prevent the bulls against various diseases they are routinely vaccinated against various bacterial and viral diseases e.g. Foot and Mouth disease (FMD), Rinderpest (RP), Heamorrhagic septicemia (HS) and Black quarter (BQ). Vaccination is one of the major stress factor that affects the semen quality. (Venkatareddy *et al.*, 1991 and Murugavel *et al.*, 1997). Viral vaccination produces more deleterious effect than that with bacterial vaccines (Venkataswami *et al.*, 1972). Foot and Mouth disease vaccination adversely affects the semen quality of exotic and crossbred bulls (Sexana and Tripathi 1977, Gahlot *et al.*, 1990 and Venkatareddy *et al.*, 1991). Literature regarding effect of FMD vaccine on buffalo bull semen quality is scanty, so, the present study was planned to find out the effect of FMD vaccination on reproductive capacity of buffalo bulls.

Four adult breeding buffalo bulls stationed at Punjab Agricultural University's Dairy Farm, were used for this study. Andrological examination of the bulls was conducted before the start of experiment and the bulls having the similar physical traits and reproductive capacity and spermiograms were selected for this study. The semen was collected in the morning by artificial vagina method, twice a week. At least 2-3 false mounts were given prior to actual ejaculation. A total of 20 ejaculates (5 from each bulls) were taken before the vaccination, which served as control. Then total of 72 ejaculates (18 from each 4 bulls) were collected after the vaccination to study the effect of vaccination stress if any. Tetravalent vaccine (Hoechst Marion Russel Ltd.) was administered @ 10ml by s/c route. The reproductive capacity was studied by libido, service behaviour as per the method of Singh and Pangawkar (1989) while the reaction time was measured in seconds (Kilgour *et al.*, 1984). The maximum score of libido at the time of semen collection was given four as described by Singh and Pangawkar (1989). The data was statistically analyzed using the Analysis of Variance as described by Gupta (1998).

The various reproductive capacity parameters and rectal temperatures of the buffalo bulls have been shown in the figure. The mean libido score of the bulls before vaccination was 90.00 ± 6.1 %, after vaccination the values decreased to 56.25 ± 5.41 and 50.0 ± 8.83 % in first and second ejaculates respectively, and remained significantly low ($P<0.01$) up to 4th ejaculate (14 days) after vaccination. Then the values started recovering and achieved their normal pre-vaccination values at 5th ejaculate (17th day). Similar to the present results Abbitt *et al.* (1984) have reported a significant decrease in the libido after parentral administration of dihydrostreptomycin and oxytetracycline in bulls. Verma *et al.* (2000) has also reported a significant decrease in the libido after parentral administration of oxytetracycline.

The mean value of the service behaviour before vaccination was 65.75 ± 1.48 % and the values decreased drastically and were 46.15 ± 2.72 and 48.04 ± 1.67 % on 1st (2nd

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day) and 2nd (7th day) ejaculates, respectively. The values were significantly ($P<0.01$) decreased up to 7th ejaculate (24 days) and then the values of service behaviour score started recovering. Verma (1996) also reported similar results that there was decrease in the service behaviour score after administration of antibiotics and antipyretics to bulls.

The average reaction time in buffalo bulls was 54.70±2.2 seconds during 0-ejaculate and 121.25±2.72 and 98.25±1.02 seconds on 1st and 2nd ejaculate, respectively. The value of the reaction time was significantly ($P<0.01$) high up to 8th ejaculate (28 days) and thereafter the value returned to the normal pre-vaccination levels. However, Venkatareddy (1991) reported that the reaction time increased from 2 minutes to 2.5 minutes in Ongole bulls which lasted up to 40 days post vaccination in these breeds but the increase registered in reaction time in Jersey x Ongole crossbred bulls from 2.8 minutes to 4.5 minutes lasted up to 60 days post vaccination period. Increase in reaction time was reported up to 42 days in Jersey bulls (Gowda, 1993) and in Surti bulls up to 21 days (Kammar and Gangadhar, 1998) post vaccination. The significant decrease in the libido and service behaviour, and marked increase in the reaction time observed in the present study following FMD vaccination corresponds well with the findings of Verma *et al.* (2000), Venkatareddy (1991) and Gowda (1993). However, in our study the reaction time values retuned to pre-vaccination values earlier than reported by these workers. This can be due to species difference.

The mean rectal temperature (°C) of buffalo bulls before vaccination was 37.92 ± 0.005, following vaccination there was significant increase in rectal temperature of buffalo bulls up to 7 days (2nd ejaculate), which was 38.61±0.09 on 3rd day (1st ejaculate) and 38.77±0.07 on 7th day (2nd ejaculate). Since testicular epithelium is most sensitive of all other body tissues (Jubb and Kennedy 1963), febrile conditions profoundly affect testicular epithelium (Hafez 1968) by impairing the heat exchange mechanism of precooling arterial blood in pampiniform plexus (Harison and Veiner, 1949). Rao and Venkatataswami (1971) have reported that following vaccination (FMD) in crossbred bulls germinal epithelium of testes is profoundly affected and the regeneration of germinal epithelium takes place subsequently. So, it is purposed that vaccination causes febrile reaction in the bulls, which results in to the testicular degeneration although of very mild nature. So, the spermiograms will be affected following vaccination which suggests that after vaccination in buffalo bulls the semen collection should be suspended for one month to avoid the failure of conception.

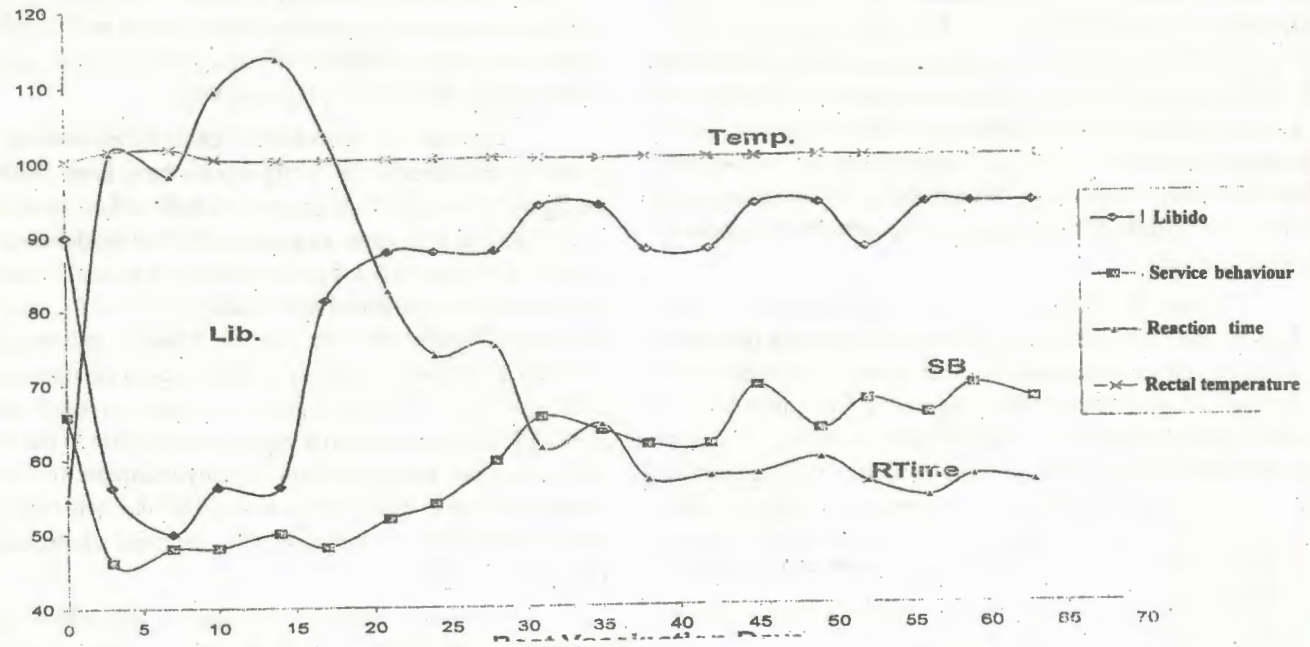

Fig. Effect of FMD vaccination on reproductive capacity and rectal temperature of buffalo bulls

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