

Early age infection of Foot and Mouth Disease affects the reproductive performance in Frieswal males

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ABSTRACT

Semen production performance of adult Frieswal bulls suffered from Foot and Mouth disease infection (FMD) at an early age (upto 1 yr) were compared with bulls of similar age group unaffected by FMD. A significant reduction in the semen donation was evident in bulls suffered with FMD at early age as compared to unaffected bulls of similar age. The mean values of semen quality in terms of volume (3.27 ± 0.19 vs 4.0 ± 0.19 ml) and mass motility (1.6 ± 0.16 vs 2.5 ± 0.10) were significantly lowered in males suffered with FMD. Study further revealed that freezable quality semen could only be obtained from only 20% of bulls suffered from FMD as compared to 73% in non affected group. These findings indicate that FMD infection at early age (upto 1 yr) affects the future semen production performance in Frieswal bulls.

Key words : FMD, crossbred bulls, semen quality

The FAO of United Nation has warned that no country can consider safe from the risk of Foot and Mouth disease (FMD) due to movement of animals, animal products and food stuffs. FMD is considered to be one of the most serious disease world wide, causes economic loss by way of reduction in milk yield, working ability of draught animals, calf mortality, abortion and delay in conception. It is also associated with reduction in fertility and loss of semen quality in breeding bulls (Bhatt and Taneja, 2001). Calf mortality due to FMD infection had been reported by many workers, where as no report is available on the performance of adult male suffered with FMD infection earlier in their life.

Pedigree and semen production performance records of Frieswal (HF x Sahiwal) bulls reared under standard farm management practices at Military farms were used. The data on fifteen males suffered by Foot and Mouth Disease (FMD) infections till they reached one year of age were recorded (group A). These animals were further divided into 3 sub groups, based on the period with in one year at which they suffered from FMD infection (sub group I, affected with FMD between 0-4 months; sub group-II affected with FMD between 5-8 months and sub-group-III, affected with FMD between 9-12 months). At adult stage

the semen production and quality of ejaculates (volume, mass activity and sperm concentration) obtained from these bulls were compared with other 15 males of similar age group unaffected with FMD infection earlier in their life (group-B). The data was analysed using ANOVA as described by Steel and Torrie (1981).

It was observed that only 50% bulls from subgroup-I had donated semen as compared to 40% bulls of subgroup-II and cent per cent donation in subgroup-III (Table 1). The overall percentage of bulls donated semen in group A were 66.6 as compared to 100 per cent donation in group 'B' (control) animals. Studies on semen ejaculated revealed that age of animal at the time of FMD infection had not affected the ejaculate volume significantly, however, infected bulls (group A) had significantly lower ($P < 0.05$) ejaculate volume as compared to control group (group B). Further it was noted that FMD infection before 120 days of age resulted into significant ($P < 0.05$) reduction in the mass activity in semen ejaculated as compared to bulls of subgroup II and III (Table II). It was evident that irrespective of age at FMD infection, group A animals had significantly ($P < 0.01$) lower mass activity as compared to control animals (group B). Similar trends were also observed in the concentration of spermatozoa in the ejaculates of subgroup I, II and III bulls. A significant reduction ($P < 0.01$) in the number of spermatozoa in the ejaculates of infected animals were

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Table 1. Effect of age at FMD infection on future semen production performance of Frieswal bulls

Group	Age at FMD infection	No. of animals	Bulls donated semen No. %	Bull donated freezable quality No. %	Volume (ml)	Mass activity (0 - 5)	Sperm conc. million/ml
Group A	I	4	2 50.0	1 50.0	3.73±0.43 ^b (15)	0.73±0.14 ^a (15)	593.33±114.00 ^a (15)
	II	5	2 40.0	1 50.0	2.32±0.30 ^a (17)	1.71±0.34 ^b (17)	1038.82±153.46 ^a (17)
	III	6	6 100.00	1 16.6	3.44±0.24 ^b (52)	1.75±0.22 ^b (52)	983.84±107.39 ^a (52)
	Overall	15	10 66.6	3 20.0	3.27±0.19 ^A (84)	1.56±0.16 ^A (84)	925.24±77.40 ^A (84)
Group B	> 12 months	15	15 100	11 73.3	4.02±0.19 ^B (117)	2.54±0.10 ^B (117)	1483.85±54.70 ^B (117)

recorded in group A bulls. Overall it was observed that only 20% bulls could donate the semen of freezable quality in group A as compared to group B where 73% bulls had donated freezable quality semen (Table 1).

Perusal of available literature do not reveal any such study wherein calf were followed after FMD infection till they donated semen. However, in adult bulls suffered from FMD were degeneration of germinal epithelium of testis were reported by Sharma (1987). Similarly, Sharma and Sane (1969 & 1972) observed deleterious effect of Foot and Mouth Disease in HF and Murrah bulls. They also reported that motility was poor with total sperm abnormalities ranging from 32-64 percent. Prasad (1983) had reported that in calves experimental Foot and Mouth disease infection resulted into degeneration of germinal epithelium of testis after 77 days.

Although in the present investigation testicular histology could not be done, however, these results indicate that in our calves FMD infection might have affected the germinal epithelium of testis which had resulted into decreased semen donation and production of poor quality semen by these animals at adult stage. These findings indicate that while selecting the bulls for future breeding and for AI centres, its calf history should be taken into account and all those calves suffered from Foot and Mouth disease should not be selected as potential donors at semen collection centres for semen preservation work.

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