REPRODUCTIVE PERFORMANCE OF INTER SE H. FRIESIAN X SAHIWAL CROSSBRED

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ABSTRACT

The records of reproductive traits for different parities of 147 F2 inter se H. Friesian X Sahiwal cows maintained at Livestock Production Research Institute, Bahadurnagar, Okara from 1982 to 1991 were collected for this study. Dry period, service period, calving interval, postpartum oestrus period, gestation period, services per conception, breeding efficiency and age at first calving, averaged 169.3 ± 12.0 days, 177.1 ± 12.5 days, 459.8 ± 12.6 days, 95.9 ± 8.12 days, 282.8 ± 0.8 days, 2.2 ± 0.1, 83.88 ± 1.74 per cent and 33.46 ± 0.51 months, respectively. The effect of parity was significant for dry period, service period, calving interval and postpartum oestrus. The effect of year of calving was non significant except for gestation period while the effect of season of calving was significant for dry period, services per conception and breeding efficiency. For age at first calving the effect of year of birth was significant while the effect of season was non significant.

Keywords: Reproductive performance, crossbred, H. Friesian X Sahiwal cow

INTRODUCTION

In the tropical cattle late maturity of heifers followed by long calving intervals are the main problems which make dairy industry uneconomical. The more number of cows become pregnant in a given period there will be more milk for sale and more calves for replacement and beef production. The reproductive traits are influenced by genetic and environmental factors. Important environmental factors are Parity, nutrition, diseases, year and season. Crossbreeding with European dairy breeds had been widely used as a method for improving the genetic potential of the indigenous animals. The present investigation was taken up to study the effect of parity, year and season of calving on reproductive trait of F2 inter se Holstein Friesian X Sahiwal crossbreeds.

MATERIALS AND METHODS

The records of various reproductive traits for different parities of 147 F2 inter se Holstein Friesian x Sahiwal (50%) cows maintained at Livestock Producction Research Institute, Bahadurnagar, Okara from 1982 to 1991 were collected for the present study, the year were divided into two seasons; Summer (April to September) and Winter (October to March). The reproductive traits studied were:- dry period (DP), service period (SP), calving interval (CI), postpartum oestrus period (PPO), gestation period (GP), services per conception (S/C), age at first calving (AFC) and breeding efficiency (BE). The effect of parity, year and season of calving/birth on these traits were studied.

Calving interval is the interval between the start of one lactation and the next calving, postpartum oestrus period is the interval from calving to first observed oestrus while the service period is the time from parturition to the next successful breeding. The period from fertilization of ovum to the time of calving or parturition is gestation period. The breeding efficiency expresses the number of calving per annum on lifetime basis. The breeding efficiency (BE) of individual cows, which have calved at least three lactations was calculated using the formula of Wilcox *et al.* (1957). The formula is:-

B.E. = 365 (n-1) x 100
n = is number of parturitions
D = is number of days from first parturition to last parturition i.e. 365.

The data was analyzed by Mixed Model Least Square and Maximum Likelihood computer programme PC-1 Version (Harvey, 1990).

RESULTS AND DISCUSSION

The least squares means, standard errors and analysis of variance for different factors affecting dry period, service period, calving interval, postpartum oestrus period and gestation period are presented in Table 1.

Amin *et al.* (1991) has reported similar values (160 ± 12 days) for dry period in Holstein Friesian crossbreds. The dry period (96.83 ± 4.45 days) and service period (113.33±7.47 days) reported by Mudggal *et al.* (1986) in H. Friesian x Sahiwal crossbreds and Chaudhry *et al.*

(1977) in Holstein Friesian x Sahiwal crossbreds (107.05 and 125.12 days, respectively) at various Military Farms is lower than recorded in this study. Bhatnagar *et al.* (1986) has also reported lower dry period for Karan Fries (65.4±1.7 days) and Karan Swiss (70.8±2.2 days). The calving interval of 455.92 and 462.1 days reported by Singh and Dave (1989) and Sharma *et al.* (1988), respectively is in agreement with our findings. However,, the calving interval reported by Bhatnagar *et al.* (1986) in Karan Swiss and Karan Fries (416±6 and 387±5 days, respectively) is lower than our results. Syrstad (1989) concluded from different studies that in F2 inter se H. Friesian crossbreds the calving interval ranged from 421 to 592 days, he further added that from F1 to F2 the calving interval increased by 5.8 percent. The postpartum oestrus period reported by Kale *et al.* (1992) in Jersey crossbreds is close to this investigation while Jaiswal *et al.* (1979) have reported lower postpartum oestrus period in Hariana crossbred from three exotic breed at Haryana Agricultural University Hissar (India). This can be attributed to better reproductive management of this herd. The gestation period of 283.12±2.36 days, reported by Sharma *et al.* (1988) has lower calves (279..22±2.96 days) in Jersey and Friesian crossbreds than Rathi and Sahiwal.

The effect of parity was significant for all these traits except gestation period. The effect of season of calving was significant for dry period only while the effect of year of calving was non-significant for all these traits except gestation period. No definite trend due to parity or year of calving was observed for these traits (Table 1). Bhatnagar *et al.* (1986) have reported significant effect of parity on dry period but they reported non-significant effect of season of calving on dry period. Pandey *et al.* (1986) have also observed non-significant effect of season of calving on dry period. Mudgal *et al.* (1986) has reported significant effect of parity and dry period; they have also reported significant effect of parity and season of calving on service period. Sharma and Singh (1986) have reported significant effect of parity on service period and calving interval; they have also reported significant effect of season of calving on claving interval. Jadhav *et al.* (1991) have also reported significant effect of parity on calving interval but non significant effect of season of calving. Chaudhry *et al.* (1977). Bhat *et al.* (1978) have reported non-significant effect of season of calving on service period. Jaiswal *et al.* (1979) have reported non significant effect of season of calving on postpartum oestrus. Mudgal et al (1985) has reported non significant effect of parity on gestation period but effect of period was reported to be significant.

The least squares means standard errors and analysis of variance for different factors affecting services per conception, breeding efficiency and age at first calving are presented in table 2.

The service per conception (2.47 ± 0.12) reported by Jaiswal *et al.* (1979) in Hariana crossbreds and breeding efficiency of 88.16 ± 3.08 per cent reported by Sharma *et al.* (1988) in Ongole crossbreds is in close agreement with the present study. Sodakar *et al.* (1988) have reported quite low breeding efficiency in Friesian X Sahiwal crossbreds maintained at Military Farms. The age at first calving is lower than reported by Singh and Dave (1989) in H. Friesian X Tharparkar inter se crosbreds (1391.00 ± 33.97 days) and by Syrstad (1989) in F2 inter se corssbreds (33.2 to 42.2 months) from nine different studies. The lower age at first calving can be attributed to better feeding and management of the herd under this study (Table 2).

The effect of parity was non significant for services per conception while the effect of year was significant for age at first calving and non significant for services per conception and breeding efficiency. The effect of season was significant for services per conception and breeding efficiency but non significant for age at first calving (Table 2).

Roy and Tripathi (1992) found significant effect of period and season on age at first calving. Bhat *et al.* (1978) found non-significant effect of season of calving on age at first calving. Similarly Sing *et al.* (1988) found significant effect of season on age at first calving. Kale *et al.* (1992) observed non significant but Kaushik (1979) has reported significant effect of period and season of calving on services per conception. Kale *et al.* (1992), Jaiswal *et al.* (1979) and Jadhav *et al.*, (1991) have reported non-significant effect of season of calving on services per conception. Sodakar *et al.* (1988) stated that effect of period on breeding efficiency was significant but effect of season was non-significant.

The performance of winter calvers was better than summer calvers which indicates the favourable physiological functioning of different body systems due to low temperature, humidity and the availability of quality green fodder during winter. The significant seasonal effect on some of the reproductive traits of the crossbreds suggests that these traits can be improved through better feeding and management practices and strong reproductive management. It has been reported by some researchers (Chaudhry *et al.*, 1977) that reproductive traits are mostly governed by the environmental factors. Inter se breeding results into increased variability in F2 generation progeny due to segregation of genes. The variation within the population indicates the fact that these traits are influenced by management.

The variation in the results from earlier studies can be attributed to differences in the agro-climatic conditions, managemental and feeding practices, different genetic make up of the crossbreds and variation in the division of year for various seasons.

Table 1: LS means and SE for dry period, service period, calving interval, postpartum, oestrus and gestation period in inter SE crossbreds

Effect	No.	Dry period	Service period	Calving interval	No.	Periods are in days	
						Postpartum period	Gestation period
Overall mean	255	169.3 ± 12.0	177.1 ± 12.5	459.8 ± 12.6	341	95.9 ± 8.10	282.8 ± 0.8
Parity							
1	106	156.3 ± 12.8 a	177.9 ± 13.4 b	465.5 ± 13.5 b	133	122.0 ± 8.5 b	283.1± 0.9
2	71	178.8 ± 14.9 a	154.7 ± 15.5 ab	438.6 ± 15.6 ab	93	107.1 ± 10.5 b	280.9 ± 1.01
3	40	236.0 ± 18.7 a	128.7 ± 19.5 a	411.4 ± 19.7 a	61	81.9 ± 12.6 a	284.4 ± 1.3
4	18	128.3 ± 27.3 a	121.7 ± 28.4 a	407.1 ± 28.6 a	28	68.1 ± 17.9 a	283.0 ± 1.8
5	14	135.7 ± 29.8 a	146.6 ± 31.1 ab	429.5 ± 31.3 ab	16	95.7 ± 23.1 ab	282.1 ± 0.3
6	6	280.6 ± 45.1 b	333.0 ± 47.0 a	606.8 ± 47.4 c	10	94.9 ± 29.2 ab	280.2 ± 3.0
Year							
1982	10	123.1 ± 37.2	198.4 ± 38.8	427.0 ± 36.0	12	93.3 ± 28.0	279.2 ± 2.8 a
1983	24	179.8 ± 25.5	197.9 ± 26.6	401.0 ± 42.8	24	121.1± 20.5	279.2 ± 2.8 a
1984	23	254.5 ± 25.1	172.9 ± 26.1	470.7 ± 39.1	24	98.6 ± 19.9	279.2 ± 2.0 a
1985	25	178.4 ± 23.4	187.1 ± 24.4	474.8 ± 26.8	34	84.4 ± 16.6	283.4 ± 1.7 a
1986	57	187.8 ± 18.3	154.4 ± 19.1	455.6 ± 26.3	60	114.7 ± 13.7	282.5 ± 1.4 a
1987	34	207.0 ± 20.5	204.2 ± 21.4	467.9 ± 24.6	47	117.7 ± 14.4	285.0 ± 1.5 a
1988	37	199.4 ± 19.2	225.6 ± 20.1	466.9 ± 19.2	52	115.4 ± 13.4	282.2 ± 1.4 a
1989	26	139.7 ± 22.0	153.5 ± 22.9	486.9 ± 21.5	43	81.7 ± 14.4	282.6 ± 1.5 a
1990	11	161.9 ± 34.3	138.2 ± 35.8	508.2 ± 20.2	26	60.8 ± 18.2	285.8 ± 1.9 b
1991	8	161.4 ± 40.7	108.7 ± 2.5	439.0 ± 23.1	19	62.0 ± 21.7	288.1 ± 2.2 b
Season							
Summer	94	184.7 ± 15.2 a	189.3 ± 15.9	474.2 ± 16.0	133	96.9 ± 10.1	282.8 ± 1.0
Winter	161	153.9 ± 12.7 b	164.9 ± 13.2	445.4 ± 13.3	208	93.0 ± 9.0	282.8 ± 0.9

Means carrying same letter did not differ significantly from another within a classification

Table 2: LS means and SE for services per conception, breeding efficiency and age at first calving in inter Se crossbreds

Effect	No.	Services/conception (No.)	No.	Breeding efficiency (%)	No.	No. Age at 1st calving (month)
Overall mean	341	2.20 ± 0.1	113	83.88 ± 1.74	147	33.46 ± 0.51
Parity						
1	133	2.14 ± 0.2	-	-	-	-
2	93	2.10 ± 0.2	-	-	-	-
3	61	2.46 ± 0.2	-	-	-	-
4	28	2.36 ± 0.3	-	-	-	-
5	16	2.20 ± 0.4	-	-	-	-
6	10	2.09 ± 0.5	-	-	-	-
Year						
1982	12	1.80 ± 0.5	11	82.83 ± 4.32	12	3.0.89 ± 1.44 a
1983	24	2.63 ± 0.4	20	78.70 ± 3.16	23	35.30 ± 1.04 bc
1984	24	2.66 ± 0.4	7	81.15 ± 5.33	7	38.59 ± 1.90 a
1985	34	1.63 ± 0.3	6	79.30 ± 5.79	10	35.17 ± 1.58 abc
1986	60	2.21 ± 0.2	40	78.14 ± 2.21	42	32.87 ± 0.77 ab
1987	47	2.22 ± 0.3	4	79.81 ± 7.00	9	31.62 ± 1.66 ab
1988	52	1.93 ± 0.2	14	84.19 ± 3.76	22	34.09 ± 1.08 ab
1989	43	2.04 ± 0.3	6	98.05 ± 5.79	9	30.57 ± 1.67 a
1990	26	2.86 ± 0.3	5	92.70 ± 6.42	4	31.62 ± 2.53 ab
1991	19	2.28 ± 0.4	-	-	9	33.82 ± 0.72 abc
Season						
Summer	133	2.55 ± 0.2 a	47	80.04 ± 2.51 a	67	32.83 ± 0.72
Winter	208	1.90 ± 0.2 b	66	87.7 ± 1.93 b	8000	34.08 ± 0.61

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