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Incidence and causes of repeat breeding in crossbred dairy cows - a retrospective study*

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ABSTRACT

The data for the present study were collected from Military Dairy Farm, Bareilly for a period of 10 years and the effect of season, parity, breed, milk yield and periparturient diseases on incidence of repeat breeding (RB) were analysed. The overall incidence of RB in Friesian x Sahiwal crossbred cows was 28.38 percent. The incidence was higher in spring calved than other seasons. The incidence of RB was also found higher (35.68%) during second than other parities. An increased incidence of RB was recorded in higher crosses (7/16, 5/8 and 3/4) and high yielders (36.10%). Abnormal calvings had significant influence on incidence of RB.

Key words: Repeat breeding, crossbred cows

Epidemiological investigation has indicated involvement of risk factors for repeat breeding (RB). The incidence of RB ranges from 4.26 (Narladkar *et al.*, 1994) to 42.7 percent (Bhosrekar, 1973) in different managemental herds. Many factors viz., season (Sharma *et al.*, 1991), breed (Singh *et al.*, 1983), parity (Dhabale and Sharma 1999), periparturient diseases (Lafi and Kaneene, 1992) and milk yield (Bartlett *et al.*, 1986) have been reported to influence the occurrence of RB in dairy cattle. These factors, however, have been reported separately and it is very difficult to assess their relative contribution to this problem (Lafi and Kaneene, 1992). This study was designed to find out the incidence and magnitude of repeat breeding syndrome (RBS) in crossbred cows in an organized dairy farm.

MATERIALS AND METHODS

The Friesian x Sahiwal crossbred cows were maintained under standard feeding and managemental conditions at Military Dairy Farm, Bareilly, U.P. Breeding history sheets and individual cow cards of 291 crossbred cows for a period of 10 years from 1989 to 1998 were analysed to study the incidence and magnitude of RBS. Detailed informations on cow number, genetic group, parity, year of calving, seasons of calving, nature of calving, season of repeat breeding, milk yield and number of services per conception were recorded. The data were analysed to study the following aspects of RBS.

(i) **Overall incidence of RB** : It was calculated as the percentage of lactations in which three or more inseminations were recorded.

(ii) **Season** : The year was divided into four seasons viz., spring (Feb. to Apr.), summer (May to Jul.), autumn (Aug. to Oct.) and winter (Nov. to Jan.) (Sharma *et al.*, 1991). The effect of calving season on occurrence of RB was also analysed.

(iii) **Breed (Exotic inheritance)**: On the basis of exotic inheritance the cows were grouped into 6 grades as 1/4, 3/8, 7/16, 5/8, 3/4 and 7/8 and the effect of exotic blood level on occurrence of RB was studied.

(iv) **Parity** : The effect of parity on incidence of RB was studied upto 5th parity separately and 6th and above parities combined together.

(v) **Milk yield** : The data on milk yield (Kg) for each lactation was recorded. Average herd milk yield for 300 days lactation length was calculated. Based on herd average milk production the animals were grouped either as high yielders or as low yielders (<3003 kg/lactation) and comparison was made between milk yield and RBS.

(vi) **Periparturient diseases**: Incidence of repeat breeding in cows following certain periparturient diseases viz., abortion/still birth, dystocia and retention of fetal membranes (RFM) were recorded and compared with the occurrence of RB in normal calvers.

Statistical analysis : Normal deviate test was applied to test the effect of exotic blood level, parity, milk yield, periparturient

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diseases and season of calving on occurrence of RB. Interrelationship between genetic group, parity, milk yield and RB was analysed by least square analysis of variance (ANOVA), as per snedecor and Cochran (1989).

RESULTS AND DISCUSSION

The overall incidence of RB in crossbred cows was 28.38 percent, (Table 1), which is slightly higher than the earlier reports in Sahiwal and their crosses (Dhabale, 1995 and Deshmukh and Kaikini, 1999). The finding of significantly higher incidence of RB in spring (38.65 percent, Table 2) calved animals is in conformity with earlier observations of Shukla and Pandit (1989). This may be due to higher environmental temperature and humidity resulting heat stress condition. The high environmental heat alters the secretion of pituitary gonadotropins in cows (Wolfenson *et al.*, 1997) and exerts detrimental effect on follicular dynamics in dairy cows (Badinger *et al.*, 1993).

An higher incidence of RB in cows with the increase in exotic blood level (7/16, 5/8 and 3/4) in the present study (Table 3) is comparable with the earlier reports (Shukla and Pandit, 1989 and Pandey *et al.*, 1994).

The incidence of RB was found to be maximum (35.68 percent) in 2nd parity, (Table 3) which is in agreement with the reports of Dhabale and Sharma (1999). This could be probably due to lactational stress and hormonal imbalance as crossbreds have been observed to produce maximum milk during this period (Dhabale, 1995). The results of the present

Table 1. Incidence of repeat breeding (year wise) in Friesian X Sahiwal crossbred cows

Year of calving	No. of lactations studied	No. of repeaters	Percentage of breeding
1989-90	24	1	4.16
1990-91	32	7	21.88
1991-92	53	74	26.42
1992-93	83	20	24.04
1993-94	101	34	33.66
1994-95	136	39	28.05
1995-96	173	47	27.17
1996-97	223	62	27.80
1997-98	289	93	32.18
1989-98	1117	317	28.38

Table 2. Incidence of RB in relation to season of calvings

Sl.No	Season of calving	No. of calvings	No. of RB	Percentage of RB
1	Spring (Feb.-Apr.)	251	97	38.65[a]
2	Summer (May-July)	197	50	25.38[b]
3	Autumn (Aug.-Oct.)	255	65	25.49[b]
4	Winter (Nov.-Jan.)	414	105	25.36[b]

Percentage of RB having different superscripts differ significantly (P<0.01).

Table 3. Incidence of RB in relation to level of exotic inheritance, parity and milk yield in crossbred cows

Sl. No.	Factors	No. of lactations studied	No. of repeaters	Percentage of repeat breeding
1	**Level of exotic inheritance**			
i)	1/4	18	4	22.22[a]
ii)	3/8	123	31	25.21[ab]
iii)	7/16	265	75	28.34[b]
iv)	5/8	368	104	28.30[b]
v)	3/4	112	39	34.82[c]
vi)	7/8	231	64	27.72[ab]
2	**Parity**			
i)	One	289	56	19.37[a]
ii)	Two	269	96	35.68[b]
iii)	Three	216	56	25.93[c]
iv)	Four	158	51	32.28[b]
v)	Five	112	35	31.25[b]
vi)	Six and above	73	23	31.51[b]
3	**Milk yield***			
i)	High milk yield (>3003kg/Lactation)	518	187	36.10[A]
ii)	Low milk yield (<3003kg/Lactation)	599	130	21.70[B]

*Herd average milk yield / 300 lactation days.
Values within same column, having different superscripts differ significantly (a,b,c, - P<0.05; A,B - P<0.01).

study (Table 3) also indicate an higher (36.10%) incidence of RB in high producing cows than low yielders (21.70%), which is in accordance with the observations of Martinez and Thibier (1984). There was a positive correlation existed between exotic inheritance with milk yield in RB cows as reported by others (Lafi and Kaneene, 1992 and Pandey *et al.*, 1994).

Out of 1117 calvings recorded in the present study, 165 were had periparturient diseases and incidence of RB following such abnormal calvings was significantly higher (Table 4) than normal calving animals. This observation is in conformity with earlier reports (Lafi and Kaneene, 1992 and Labermia *et al.*, 1998). The periparturient complications such as abortion/still birth, dystocia and RFM resulted in retarded

Table 4. Incidence of RB in relation to periparturient diseases

Sl. No.	Nature of calving	No. of calvings studied	No. of repeaters	Percentage of repeat breeding
1	Normal calving	952	238	25.00[a]
2	Abortion/still birth	60	31	51.67[b]
3	Dystocia	4	3	75.00[c]
4	RFM	101	45	44.55[b]

Values having different superscripts differ significantly (P<0.01).

rate of uterine repair and ovarian activity (Lafi and Kaneene, 1992) and establishment of chronic endometrial lesions (Martinez and Thibier, 19984). Such animals required more number of inseminations per conception in subsequent breeding period. Hence, the periparturient diseases have been considered as most significant risk factors associated with RBS. Further, out of 58 repeater cows, there was no cows remained as habitual repeater throughout its breeding life. This contention receives support from the finding of Namboothiripad and Raja (1972). Thus, a cow which was a repeater in one breeding period might behave similarly or as a normal cow in the subsequent breeding indicating that RB may be a managemental rather genitically controlled one.

From this study, it can be concluded that incidence of RB was recorded higher in high milk yielders and higher crosses. Abnormal calvings had significant influence on incidence of RB.

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