Effect of Genetic Factors on mortality in Cross-bred cattle Holdeo (HF X Deoni)

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Abstract

The studies on the mortality pattern of crossbred '*Holdeo'* animals was conducted at MAU,Parbhani. The data of total 519 animal's mortality were studied and tabulated according to generation, season, sex, age, and cause of mortality. The result revealed the F1 generation proved more susceptible to the situation than interse progeny. The highest overall mortality was observed in season S3 -summer (9.28 per cent), season S1 -Monsoon (7.43 per cent) and S2 - winter (5.08 per cent) respectively. There was a non-significant effect of sex on mortality pattern in all genetic groups; however, higher mortality seems in female calves. Mortality due to cause of Class-II (9.78 per cent) followed by Class-I (4.40 per cent), Class-IV (3.99 per cent), Class-III (2.06 per cent) and Class-V (1.56 per cent) respectively. The mortality percentage of different age group was found as non-significant in all generations.

Keywords: Mortality, crossbred and Holdeo.

Introduction

Crossbreeding of our native cows with high potential exotic bulls like Friesian, Jersey, Brown Swiss, Red Dane has been resorted to boost up the milk production and develop high yielding cows through suitable breeding programme. This programme since 1960 onwards has been implemented on extensive scale in the country. The development of crossbred animals at farmers level has been attempted through artificial insemination of village cows with frozen semen from exotic bulls. The exotic and indigenous inheritance through crossbred cow has to respond under our agro-climatic condition and prove its merit on the basis of its befitting performance in our system of farming.

The production potential of Indian breeds is limited in respect of milk production but the hardiness for tropical climatic condition is well known. The conventional methods of breeding requires prolonged period for improvement in genetic material. Hence, it was decided to enrich the present genetic status of indigenous breeds by way of crossing it with the elite genetic material of exotic breeds. Accordingly the programme of crossbreeding was formulated and implemented by Marathwada Agricultural University, Parbhani from 1972. In which it was decided to cross the Deoni breed with elite exotic breed i.e. Holstein Friesian and the Red Kandhari breed with Jersey. The MAU has introduced a new breed known as 'Holdeo' by crossing Deoni with HF.

Materials and Methods

The Cattle Cross Breeding Project Department of Animal Husbandry and Dairy Science, maintains the pure germ plasm of Deoni breed and the unit has introduced a crossbred named as Holdeo by crossing Holstein Friesian (HF) with Deoni. The data of total 519 animal's mortality were made available for the study from the records. It was tabulated according to generation. Four generation considered for study i.e. F1 (Holstein Friesian x Deoni),G1, G2 and G3 (Interse progeny), sex(males and females) and age i.e. six groups (.Birth to 30 days of age,31 to 90 days of age,91 to 180 days of age,181 to 365 days of age,1 to 3 yrs. of age, Adult (Above 3 yrs.). The data covering a period for 20 years i.e. from January 1985 to December 2004 was collected from the mortality records. The data pertaining to mortality was analyzed by Chi-square test (Fedrer, 1967).

Results and Discussion

From the results found in Table 1, the overall mortality in crossbred cattle was 21.79 per cent. It is highest in females (11.21%) crossbred cattle in comparison with males (10.58%) mortality. The highest mortality was observed in F1 genetic group (16.96%) followed by G1 (3.23%), G2 (1.13%) and G3 (0.46%).

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There was a non-significant effect of sex on mortality pattern in all genetic groups. Similar results were reported by Chavai, *et al*. (1999), Singh *et al*. (2005) and Kumar *et al*. (2004). The highest mortality percentage of females in F1 generation (9.07%) than males (7.89%). In interse G1, G2 and G3 genetic groups males showed more mortality percentage (1.76, 0.63 and 0.29%) than females (1.47,0.50 and 0.168%), respectively. Thus, the result on mortality among the males and females indicates that there was a higher loss of male calves than females in interse generation G1, G2 and G3. Female calves mortality was highest than male calves (Kinjavdekar *et al,* 1994 and Somawanshi 1995). Sex did not show any distinct variation (Chavai *et al*. 1999, Singh *et al*. 2005).

From the results in Table 2, the overall mortality pattern in different genetic groups was 10.50, 4.53, 3.15, 2.52, 0.42 and 0.67 per cent at age group of 0-30 days, 31-90 days, 91-180 days, 181-165 days, 1-3 years and adults, respectively. The mortality percentage between different age group as non-significant in all genetic groups. The mortality percentage in F1, G1, G2 and G3 crossbreds at the age group of 0-30 days were 8.06, 1.55, 0.63 and 0.25% respectively. While at the age group of 31-90 days it was 3.32, 0.88, 0.21 and 0.13% respectively. The mortality percentage at the age group of 91-180 days were 2.64, 0.33 and 0.17 per cent under F1, G1 and G2 crossbreds, respectively. At the age group of 1-3 years they were 0.25 and 0.13 under F1 and G1 generation and 0.042% in G3 generation, respectively. At the adult age group the mortality percentage was 0.50, 0.13 and 0.042 under F1, G1 and G2 generation, respectively. The F1 and G1 genetic groups suffered more than other genetic groups. The overall mortality rate was more in 0-30 days age group (10.50 per cent) which was considered to be more. The rate in 1-3 years age group was less (0.42%) which was considered to be a low mortality rate.The half of the mortality occurred in the first 15 days of life (Katoch *et al,*1994). High mortality during 0-3 months of age in Murrah buffalo calves (Pradhan and Panda 1994,Thanga *et al,*2001),overall mortality for crossbred calves (0-6 months) was more 45.8% (Rajeev Singh *et al,*2005). 50% of total mortality was recorded upto the age of 3 months (Singh *et al,*2003).

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Table-1. Genetic groupwise mortality of different sex.

Sex	Genetic groups				Total
	F_1	G_1	G_2	G_3	
Male	7.89(188)	1.76(42)	0.63(15)	0.29(7)	10.58(252)
Female	9.07(216)	1.47(35)	0.50(12)	0.168(4)	11.21(267)
Overall	16.96(404)	3.23(77)	1.13(27)	0.46(11)	21.79(519)
Chi-square value	0.66 ^{NS}	1.105 ^{NS}	0.529 ^{NS}	1.003 ^{NS}	

Table-2. Genetic groupwise mortality at different age groups (per cent)

Sex	Genetic groups				Total
	F_1	G_1	G_2	G_3	
0-30 days	8.06 (192)	1.55 (37)	0.63 (15)	0.25 (6)	10.50
(250)	31-90 days	3.32 (79)	0.88 (21)	0.21 (5)	0.13 (3)
4.53 (108)	91-180 days	2.64 (63)	0.33 (8)	0.17 (4)	- (0) 3.15
(75)	181-165 days	2.18 (52)	0.21 (5)	0.08 (2)	0.042 (1)
2.52 (60)	1-3 years	0.25 (6)	0.13 (3)	-	0.042 (1)
0.42 (10)	Adult	0.50 (12)	0.13 (3)	0.042 (1)	- (0) 0.67
(16)	Overall	16.95 (404)	3.23 (77)	1.132 (27)	0.464 (11)
21.79 (519)	Chi-square value	1.730^{NS}	5.853^{NS}	1.334^{NS}	5.272^{NS}