CALF MORTALITY IN CROSSBRED DAIRY CATTLE

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SUMMARY

Information is given on crossbred calves between birth and 6 months of age belonging to 6 genetic groups—3 with 50% inheritance from Holstein, Jersey and Brown Swiss and the other 3 with 75% inheritance from 1 or 2 temperate dairy breeds. The mortality rate in 1,059 calves born was 3.87, 2.84 and 1.22% respectively under 1 month, from 1 to 3 and from 3 to 6 months of age. The mortality rate was lower in halfbreds than in crosses with 75% inheritance from temperate breeds. Season of birth, sex of the calf and birth weight did not show any significant association with mortality rate but the latter showed a definite decline with advancing age.

No significant association of cause of mortality with age, genetic group and season of birth of the calves was observed. Percentage mortality was largely due to respiratory diseases in the birth to 1 month age group while diseases affecting the digestive system resulted in more deaths in the 3 to 6 months age group.

INTRODUCTION

Crossbreeding experiments in dairy cattle are in progress at various institutions in India to identify the level of inheritance from temperate dairy breeds and breed combinations to suit agro-climatic conditions of different regions. For a profitable dairy enterprise, besides the production potential of animals, their survival rate is also important as the replacement stock available determines the number of animals that can be culled for poor production.

The mortality rate in crossbred calves in tropical countries has been reported by some workers (Pearson de Vaccaro, 1974; Sharma, Jain and Noble, 1975; Buvanendran, 1977; Katpatal, 1977). The major causes of mortality among young calves have also been, to a large extent, identified and reported by Minnet (1946), Singh and Singh (1971), Sharma et al (1975) and Chanda and Nayak (1977). However, the information on the mortality rates of calves with different levels of Bos taurus inheritance from different breeds raised under similar management is very limited. In the present study analysis of incidence of mortality in crossbred calves between birth and 6 months of age with inheritance from 3 temperate dairy breeds—Holstein, Jersey and Brown Swiss, and zebu inheritance from Tharparkar has been conducted. Factors affecting the mortality rate and major causes of mortality were also examined.

MATERIALS AND METHODS

A crossbreeding experiment was started at the National Dairy Research Institute, Karnal in 1971 with the objective of evaluating the performance of crossbreds obtained by inseminating Tharparkar cows (T) with imported frozen semen of progeny tested bulls belonging to Holstein (H), Jersey (J) and Brown Swiss (BS) breeds. The halfbred females (½H x ½T, ½J x ½T and ½BS x ½T) were inseminated with semen from Holstein bulls to obtain ¼H x ¼T, ½H x ¼J x ¼T and ½H x ¼BS x ¼T progeny. The first halfbred calf resulting from this breeding trial was born in December 1971. All the female calves were retained and most of the male calves were disposed of at varying ages. The mortality data are on 6 genetic groups spread over a period of 6 years. The information on
both male and female calves is included, though the number of male calves retained decreased progressively with age. The stillbirths have not been included in the mortality data.

The period of life from birth to 6 months was divided into 3 age groups, viz, group I—0 to 1 month, group II—1-1 to 3 months and group III—3-1 to 6 months. The mortality rates in these 3 age groups were calculated as the percentage of calves that died. The calendar months were grouped into 4 seasons based on the climatological conditions. These were:

1. Cold season (December to February).
2. Comfortable season (March, April, October and November).
3. Hot-dry season (May and June).
4. Hot-humid season (July to September).

The year effects were not considered as the managemental practices were more or less similar over the period of 6 years.

The calves were grouped into 3 categories in each genetic group based on their birth weight in the following manner:

1. < 1 standard deviation below the mean.
2. Mean ± 1 standard deviation
3. > 1 standard deviation above the mean.

The parity order of the dam in which the calf is born was classified into 4 groups, first, second, third and fourth or later parities.

The diseases resulting in death were classified into 4 major groups based on the post-mortem findings as:

2. Respiratory.
3. Combination of gastro-intestinal and respiratory.
4. Miscellaneous, such as debility, congenital defects, etc.

The association of genetic group, sex, season of birth, age and birth weight of the calf and parity order of the dam with mortality rate was tested by the chi-square test. The association of causes of mortality with season of birth, genetic group and age of the calf was similarly tested.

**RESULTS AND DISCUSSION**

The mortality rates over all genetic groups in the age groups I, II and III were 4.06, 3.85 and 3.17% in males and 3.68, 2.47 and 0.67% in females respectively. These values were low compared to 17.04, 2.98 and 1.27% in males and 14.58, 4.61 and 1.70% in females reported by Sharma *et al* (1975) in Brown Swiss crosses with Sahiwal. But the present observations are comparable to those reported by Buvanendran (1977) in Ayrshire and Jersey crosses with the Sinhala breed in Sri Lanka and Katpatal (1977) in Friesian, Jersey and Brown Swiss crosses with various breeds of zebu cattle in India.

(i) Factors affecting the mortality rate

(a) Genetic group

The mortality rates in different genetic groups in male and female calves in the 3 age groups are presented in Table I. The mortality rate was the lowest in ½J × ½T in the age group I in both sexes. The association between mortality rate and genetic group