GENETIC STUDIES ON PRODUCTIVE TRAITS OF SAHIWAL AND SAHIWAL X JERSEY CROSSBRED COWS


Department of Animal Genetics and Breeding
Post Graduate Institute of Veterinary and Animal Sciences, Akola-444104, India

Received : 15-12-2010 Accepted : 09-05-2011

ABSTRACT
The data on 194 lactations of Sahiwal cows and 81 lactations of Sahiwal x Jersey crossbred cows of Bull Mother Farm, Wadsa Dist. Gadchiroli (M.S.) spread over a period 19 years (1989 to 2007) were analyzed by least square techniques to study the effect of sire, season of calving and period of calving on lactation milk yield, lactation length and dry period. Least square analysis of variance shows that period of calving was highly significant for lactation milk yield in Sahiwal and Sahiwal x Jersey crossbreed cows however season of calving had non significant effect on all traits in Sahiwal and Sahiwal x Jersey crossbred cows. Sire had highly significant effect on lactation milk yield and lactation length in the Sahiwal x Jersey crossbreed cows. The overall least squares means for lactation milk yield, lactation length and dry period of Sahiwal and Sahiwal x Jersey crossbred cows were 1122.74±80.74kg and 1391.38±171.51kg; 279.72 ± 6.55 days and 288.49±9.19 days; 247.14±33.69 days and 249.72±21.36 days, respectively. The moderate to high heritability estimates indicate that they can be improved through selective breeding.

Key words: Sahiwal, Sahiwal x Jersey crossbred cows, Lactation milk yield, Lactation length, Dry period, Heritability.

INTRODUCTION
Sahiwal is one of the best dairy breeds of cattle in Asia, having its breeding tract in Montgomery district of Pakistan. It has high producing ability under harsh environment. To fill up the gap between availability and the dietary requirement, crossbreeding is necessary with exotic breeds which should give prime importance in national dairy industry of India. Among exotic breeds of cattle, Jersey is suitable for crossbreeding to Indian climate. Due to crossbreeding the pure bred animals of our country are going in towards extinction. Due to its utmost importance and unique characteristics, it needs conservation as pure breed like Sahiwal.

The present investigation is therefore carried out to know the productive performance of Sahiwal and Sahiwal x Jersey crossbred cows for lactation milk yield, lactation length and dry period.

MATERIALS AND METHODS
The data on 194 lactations of Sahiwal cows and 81 lactations of Sahiwal x Jersey crossbred cows of Bull Mother Farm, Wadsa Dist. Gadchiroli (M.S.) spread over period of 19 years (1989 to 2007) were analyzed. The years were group into five periods and each year was grouped into 3 seasons viz. Winter (November-February), Summer (March to June) and Rainy (July-October). Cows with abnormal record viz. abortion, still birth and death of the cows during lactation were excluded from the investigation. The traits included in the study were lactation milk yield, lactation length and dry period. The least squares analysis of variance (Harvey, 1990) were used to study the random effect of sire and fixed effect of period of calving and season of calving. Heritability, genetic and phenotypic correlations were estimated by half sib analysis of variance (Mukherjee and Banerjee, 1980).

RESULTS AND DISCUSSION
Least squares analysis of variance shows that the effect of period of calving was highly significant for lactation milk yield in Sahiwal and lactation milk yield and dry period in Sahiwal x Jersey crossbreed cows while sire was highly significant for dry period of Sahiwal cows and lactation milk...
Vol. 46, No. 1, 2012

yield and lactation length of Sahiwal x Jersey crossbred cows. Season of calving had non significant effect on all traits in Sahiwal and Sahiwal x Jersey crossbred cows. Similarly results were also observed by Deshmukh et al. (1995) for season of calving.

The least square means for lactation milk yield of Sahiwal and Sahiwal x Jersey crossbred cows were 1122.74±80.74 kg and 1391.38±171.51 kg, respectively. The present estimate of lactation milk yield for Sahiwal cows is lower than the estimate reported by Singh et al. (1988). The estimates for Sahiwal x Jersey Crossbred cows are also lower than those reported by Rathi and Sharma (1990). Duncan’s multiple range test showed that there were reduction in lactation milk yield of Sahiwal cows and improvement in Sahiwal x Jersey crossbreds over a period of time. (Table 2 and Table 3)

The least square means for lactation length in Sahiwal and Sahiwal x Jersey crossbred cows were 279.72±6.55 days and 288.49±9.19 days, respectively. The present estimate for lactation length in Sahiwal cows is similar to those reported by Deshmukh et al. (1995), while Taneja and Sikka (1981) reported lower estimates. Rathi and Sharma (1990) and Deshmukh et al. (1995) reported higher estimates of lactation length for Sahiwal x Jersey crossbred cows than the present findings. The present estimates of lactation length for Sahiwal x Jersey crossbred cows are not much differed and are nearer to the ideal of 300 days. (Table 2 and Table 3)
The overall least square means for dry period of Sahiwal and Sahiwal x Jersey crossbred cows were 247.14\(\pm\)33.69 days and 249.72\(\pm\)21.36 days, respectively. The present estimate of Sahiwal and Sahiwal x Jersey cows are higher than the estimates reported by Rathi and Sharma (1990) and Deshmukh et al. (1995). The dry period of Sahiwal and Sahiwal x Jersey crossbred cows are on the higher side than normal and need to be reduced by proper management. (Table 2 and Table 3)

Heritability for lactation milk yield and dry period of Sahiwal cows were 0.105\(\pm\)0.150 and 0.261\(\pm\)0.213 respectively while heritability for lactation length and dry period of Sahiwal x Jersey crossbred cows were 0.919\(\pm\)0.503 and 0.150\(\pm\)0.318, respectively. These moderate to high heritability estimates indicate that the traits can be improved through selective breeding.

In Sahiwal x Jersey crossbred cows, lactation milk yield had highly significant phenotypic (0.524) and genetic correlation (0.932 \(\pm\) 0.15) with lactation length. The phenotypic correlation (0.522) of lactation milk yield with lactation length was also significant in Sahiwal cows, the other genetic and phenotypic correlations were either non significant or having higher standard error.

REFERENCES