Reproductive performance of triple cross interbred Gir cows

U Y BHOITE[1], S U BHOITE[2] and S D MANDAKMALE[3]

Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra 413 722 India

The present investigation was undertaken to evaluate various triple cross interbred groups in respect of age at first service, first fertile service and first calving.

The data pertains to 323 triple cross interbreds, viz. 149 IFJG (50% Friesian + 25% Jersey + 25% Gir interse), 70 IJFG (50% Jersey + 25% Friesian +25% Gir interse) and 104 IBFG (50% Brown Swiss + 25% Friesian + 25% Gir interse) maintained at Research - Cum-Development Project on Cattle, Rahuri, over a period of 16 years (1977 to 1992) were utilized for the present study. The least-squares means of age at first service (AFS), age at first fertile service (AFFS) and age at first calving (AFC) were estimated (Harvey 1966). The effects of genetic group, period of birth (POB) and season of birth (SOB) were considered for estimation of means. The period of births were divided as P_1 (1977-1979), P_2 (1980-1982) and P_3 (1983 and above). The births during the year were divided into three seasons, viz. summer (March- June), rainy (July-October) and winter (November-February).

The effect of genetic group on AFS was significant (P<0.01) as reported by Navale (1993). The age at first service (days) of IBFG was significantly higher than IFJG and IJFG crosses, which were at par with each other (Table 1.). The

results indicated that the heifers of triple cross interbreds having 50% inheritance of large exotic breeds (Brown Swiss and Holstein Friesian) required longer period for their first service than 50% cross of smaller breed (Jersey).

The influence of SOB on AFS was significant (P<0.01) in IFJG, IJFG and IBFG interbreds. In all the crosses heifers born during P_2 required significantly longer period for their first service than those born in later period (P_3). The differences in AFS between heifers born in P_1-P_2 and P_1-P_3 were nonsignificant. The variation associated with season of birth in AFS was nonsignificant in all three groups.

The differences due to genetic groups in age at first fertile service were significant (P<0.01). The AFFS of IBFG was significantly higher than IFJG and IJFG interbreds, which did not differ significantly from each other. This trend was similar to that noticed for age at first service.

The effect of period of birth on AFFS was significant (P<0.01) in all three genetic groups. The AFFS (days) of heifers of IFJG, IJFG and IBFG groups born during P_3 as 586.61 ± 15.35, 595.32 ± 18.95 and 629.60 ± 15.05, respectively, were significantly longer than those born in P_2. The differences in AFFS between the heifers of group P_1-P_2 and P_1-P_3 were

Table 1. Genetic group-wise least-squares means (days) of some reproductive traits

Genetic group/trait	N	AFS		AFFS		AFC	
		Mean	SE	Mean	SE	Mean	SE
IFJG	149	b 545.14	7.28	b 602.54	10.73	b 881.89	10.81
IJFG	70	b 550.46	9.51	b 603.69	14.02	b 883.40	14.11
IBFG	104	a 593.05	8.69	a 657.47	12.81	a 940.87	12.99

Means in the same column with different superscripts differ significantly from each other.

Present address: [1]Assistant Dairy Cattle Breeder, RCDP on Cattle, [2]Assistant Professor (Maths.), Inter Faculty Department of Irrigation and Water Management,[3]Junior Research Assistant, RCDP on Cattle.

nonsignificant, except the heifers of P_1-P_2 in IJFG group. The differences due to SOB in AFFS were nonsignificant in all the crosses.

The genetic group exerted significant (P<0.01) effect on age at first calving as reported by Sivaiah *et al.* (1986). In IBFG interbreds AFC was significantly higher than IFJG and IJFG groups which were at par with each other. The results showed that the triple cross interbred with 50% Jersey inheritance matured earlier and their AFC was lowest followed by interbred having 50% Friesian and 50% Brown Swiss blood level.

The influence of POB on AFC was significant (P<0.01) in IFJG, IJFG and IBFG genetic groups. In all the crosses heifers born during P_3 required significantly longer period for their first calving than those born in P_2. The differences in AFC between P_1-P_2 and P_1-P_3 groups were nonsignificant. The variation associated with SOB in AFC were nonsignificant in all the groups.

The correlations of age at first service, first fertile service and first calving with first lactation 300 days milk yield were positive and significant (P<0.01) in IFJG (0.31±0.57, 0.20±0.65 and 0.28±0.71) and IJFG interbreds (0.66±0.20, 0.59±0.26 and 0.59±0.25) whereas, negative and significant (P<0.01) in IBFG group (-0.27±0.47, -0.44±0.47 and -0.49 ±0.46 respectively).

The heritability estimates for age at first service, first fertile service and first calving were medium to high in IFJG and IBFG and the values were 0.43±0.29, 0.32±0.26 and 0.21±0.23 and 0.92±0.50, 0.39±0.36 and 0.41±0.37, respectively. Similar high values of h^2 for age at first service and first calving were reported by Senapati and Chowdhury (1988). The present results indicated that AFS, AFFS and AFC in IFJG and IBFG groups can be improved by proper individual selection of animals. The h^2 estimates of the traits in IJFG group were unreliable and the values were more than one.

SUMMARY

The data on 149 IFJ, 70 IJFC and 104 IBFG for age at first service, first fertile service and first calving, were analyzed. Genetic group and period of birth significantly affected the reproductive traits under study. The effect of season of birth on traits was nonsignificant. The age at first service, fertile service and calving in IBFG group were significantly longer than IFJG and IJFG genetic groups, which were at par with each other. The association of reproductive traits with first lactation 300 days milk yield was positive and significant in IFJG and IJFG and positive and nonsignificant in IBFG group. The h^2 estimates of traits were medium to high in IFJG and IBFG crosses.

REFERENCES

Harvey W R. 1966. *Least-squares Analysis of Data with Unequal Subclass Number.* ARSUS. Department of Agriculture, Washington.

Navale P B. 1991. 'Comparative performance of reproductive and productive economic traits of triple crosses of Gir cattle and their interbreds.' M.Sc. Thesis, MPKV, Rahuri, India.

Senapati P K and Chowdhury G. 1988. 'Genetic studies on serum amino transferase activity in relation to growth, reproduction and production in Jersey × Hariana F₁ cows. *Indian Journal of Animal Health* **27**(1): 57-61.

Sivaiah K, Mullaikharjuna Rao T T V V and Murthy A S. 1986. 'Performance of 3/4 exotic triple crosses of Ongole cattle'. *Indian Journal of Animal Sciences* **56**(2): 267-69.