“GENETIC ANALYSIS OF CLOSED HERD OF GIR CATTLE IN ITS NATIVE TRACT”

ABSTRACT

**KEY WORDS:** Gir cattle, First lactation length, First lactation yield, First 300 day lactation yield, First lactation monthly peak yield, First lactation yield per day of lactation length, First lactation yield per day of calving interval, Age at first calving, First calving interval and First dry period, Reproduction traits, Effect of non-genetic factors, Calving interval, Heritability, Genetic correlations, Phenotypic correlations, Pooled parity, Lactation length, Lactation yield, 300 day lactation yield, Monthly peak yield, Repeatability, Genetic trend.

The production and reproduction records on 700 Gir cows with 3236 lactations sired by 57 bulls maintained at Cattle Breeding Farm, Junagadh Agricultural University, Junagadh for the period of 1965 to 2016 (51 Years) were studied. The overall least squares means of first lactation length, first lactation yield, first 300 day lactation yield, first lactation monthly peak yield, first lactation yield per day of lactation length, first lactation yield per day of calving interval, age at first calving, first calving interval and first dry period were 308.9 ± 8.4 days, 1809.8 ± 43.06 Lit, 1809.8 ± 43.06 Lit, 243.0 ± 5.84 Lit, 5.7 ± 0.11 Lit, 3.7 ± 0.15 Lit, 1570.0 ± 16.93 days, 456.2 ± 17.53 days and 104.0 ± 6.59 days respectively. Season of calving had significant effect on first lactation length and first monthly peak yield while lactation yield, 300 day lactation yield, first lactation length per day of lactation yield and first lactation length per day of calving interval had no significant effect. Period of calving had significant effect on first monthly peak yield, first lactation length per day of lactation yield, first lactation length per day of calving interval and age at first caving. First lactation length and first lactation yield were significantly affected by Age at first calving. Heritability of first lactation length, first lactation yield, first 300 day lactation yield, first lactation monthly peak yield, first lactation yield per day of lactation length, first lactation yield per day of calving interval, age at first calving, first calving interval and first dry period were 0.328 ± 0.116, 0.188 ± 0.096, 0.22 ± 0.100, 0.26 ± 0.108, 0.18 ± 0.096, 0.16 ± 0.15, 0.06 ± 0.144, 0.156 ± 0.092 and 0.12 ± 0.088 , respectively.

Genetic correlation of lactation length with lactation yield, 300 day lactation yield, monthly peak yield, calving interval, dry period, lactation yield per day of lactation length and lactation yield per day of calving interval were 0.166 ± 0.325,
Genetic correlation of lactation yield with 300 day lactation yield, monthly peak yield, calving interval, dry period, lactation yield per day of lactation length and lactation yield per day of calving interval were 0.596, 0.362, 0.074, 0.339, -0.045, -0.041 and 0.169, respectively. Genetic correlation of lactation yield with 300 day lactation yield, monthly peak yield, calving interval, dry period, lactation yield per day of lactation length and lactation yield per day of calving interval were 1.010 ± 0.046, 0.834 ± 0.159, 0.626 ± 0.354, 0.866 ± 0.507, 0.927 ± 0.197 and 0.896 ± 0.229 respectively while Phenotypic correlations were 0.877, 0.636, 0.263, -0.005, 0.554 and 0.496 respectively.

Genetic correlation of 300 day lactation yield with monthly peak yield, calving interval, dry period, lactation yield per day of lactation length and lactation yield per day of calving interval were 0.858 ± 0.166, 0.479 ± 0.369, 0.930 ± 0.494, 0.920 ± 0.134 and 1.012 ± 0.165 respectively while Phenotypic correlations were 0.743, 0.185, -0.023, 0.691 and 0.597 respectively.

Genetic correlation of monthly peak yield with calving interval, dry period, lactation yield per day of lactation length and lactation yield per day of calving interval were -0.241 ± 0.380, 0.596 ± 0.434, 0.837 ± 0.158 and 0.840 ± 0.218 respectively while Phenotypic correlations were 0.064, 0.005, 0.654 and 0.478.

Genetic correlation of calving interval with dry period, lactation yield per day of lactation length and lactation yield per day of calving interval were 0.720 ± 0.333, 0.550 ± 0.412 and 0.101 ± 0.454 respectively while Phenotypic correlations were 0.471, 0.107 and 0.462.

Genetic correlation of dry period with lactation yield per day of lactation length and lactation yield per day of calving interval were 0.961 ± 0.521 and 0.635 ± 0.479 While Phenotypic correlations were 0.007 and 0.095.

Genetic correlation of lactation yield per day of lactation length with lactation yield per day of calving interval was 1.319 ± 0.248 and phenotypic correlation was 0.537

The overall means for lactation length, lactation yield, 300 day lactation yield, monthly peak yield were 308.95 ± 8.43 days, 1933.32 ± 63.01 Lit., 1820.99 ± 48.77 Lit, 276.68 ± 5.75 Lit. in 1 to 10 pool parity data analysis. Lactation length, lactation yield, 300 day lactation yield, monthly peak yield were highly significantly affected by season of calving and period of calving. The repeatability estimates of Lactation length, lactation yield, 300 day lactation yield, monthly peak yield were 0.1301, 0.0195, 0.1342 and 0.1216. Lactation length, lactation yield and 300 day lactation yield were significantly affected by calving intervals. Genetic trend of First lactation yield estimated using sire breeding values of 57 sires over a period of 51 years using Best Linear Unbiased Prediction method indicated that there was positive trend of improvement of 7.22 lit of FLY for every five year.