ASSOCIATION BETWEEN MORPHOMETRIC AND PRODUCTION TRAITS IN RURAL H.F. CROSSBRED COWS OF TARAI REGION

T. Prasad, D.V. Singh and R.J. Sharma
Department of Livestock Production and Management, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar - 263 145, India

ABSTRACT

A total of 75 HF crossbreds belonging to first and second parity with rural farmers of Tarai region of India were studied for the association between morphometric traits and production traits (estimated lactation milk yield and average lactation fat per cent). The morphometric traits included 11 biometric and 7 derived traits, measured at 15 days apart for three months pre and post-partum period. For the first lactation, significant association was observed between BL, EBW, HWBL, BS, TFT with milk yield and with BS for fat per cent. The traits like BL, GIR, EBW, HWBL, HWGR and HWPG and PGIR had their significant association with milk yield and like BL and HBBL with fat per cent in second lactation in rural H.F. crossbred cows. All these correlation coefficients were suggestive of their usefulness in selecting the animals for milk and fat.

In India, crossbred cattle contribute significantly to the country’s milk production. The buyers of rural dairy animals are generally interested in high producing animals near parturition based on the visual assessment of the animals’ probable productivity. Therefore, a prompt but indirect mean of evaluation is the only method available with the buyers in absence of performance records. Management of dairy animals about parturition is different at organized farms and rural farmers and it may lead to differences in the development of skeletal growth and body scores. Several attempts have been made to correlate morphological traits with the production performance of the dairy animals at organized farms. However, similar studies are scanty under field conditions. Since, the H.F. crossbred cows are predominantly available for milk production in U.S. Nagar district of Uttaranchal, the Tarai region, it was considered important to generate information on their morphometric traits with regard to the production performance.

Present investigation was carried out from January 2002 to April 2003 on 31 and 44 H.F. crossbred cows of first and second parity, respectively. These were identified through ear tags at rural farmers of US Nagar district of Uttaranchal. All of these animals were recorded for their morphometric traits at 15 days interval for six months period (3 months pre-partum to 3 months post-partum). The morphometric traits included: height at withers (HAW), body length (BL), chest girth (GIR), paunch girth (PGIR), distance between hook bones (DHB), distance between pin bones (DPB), oblique distance between hooks and pins (OD), height at hook bones (HHB), height at pin bones (HPB), tail skin fold thickness (TFT) and body scores (BS). Some of these traits were used to develop derived traits, such as estimated body weight (EBW), ratio between HAW and BL (HWBL), ratio between HAW and GIR (HWGR), ratio between HAW and PGIR (HWPG), ratio between GIR and PGIR (GPG), ratio between DHB and DPB (DHPB), ratio between DHB and OD (DHOD). The 305 day lactation milk yield (FLMY, SLMY) and average fat per cent (FLFT, SLFT) for first and second lactations were estimated based on monthly records as per Singh et al. (1996). The body weight was estimated using morphometric traits (Shaeffer, 1960). Phenotypic correlation coefficients among morphometric traits and production traits were obtained after adjustment of the data for significant effects (Harvey, 1987). These
coefficients were then tested for their significance as per Snedecor and Cochran (1968).

The phenotypic correlation coefficients among various morphometric traits and 305-day lactation milk yield and average fat per cent for first lactation and second lactation were as follows.

**With FLMY:** The correlations coefficient of BL (0.606±0.141 to 0.738±0.119) and EBW (0.536±0.149 to 0.602±0.141) were positive and significant (P<0.01) during entire pre- and post-partum period in rural H.F. crossbred cows. However, HWBL had negative (-0.422±0.160 to -0.616±0.139) and significant (P<0.01) association during the period of study. The association of BS was positive (0.390±0.163 to 0.635±0.137) and significant (P<0.01) at most of the time and that of HAW (0.349±0.166) at later stage. TFT showed a negative (-0.447±0.158 to 0.461±0.157) and significant (P<0.01) association around calving time only. These observations suggest that BL, GIR, BS, EBW and HWBL as important guide for selecting rural HF crossbred cows for milk yield during first lactation.

**With FLFT:** None of the traits, except BS (-0.362±0.165 to -0.533±0.150), could show their significant association with first lactation fat per cent. BS was observed to have negative and significant (P<0.01) association during pre-partum period and around calving, but not later. It indicated that the HF crossbred cows with low BS had more fat per cent in their milk during first lactation.

**With SLMY:** The correlations coefficient of BL (0.295±0.147 to 0.387±0.142), GIR (0.314±0.147 to 0.401±0.141) and EBW (0.411±0.141 to 0.478±0.136) were positive and significant (P<0.01) during entire pre- and post-partum period in rural H.F. crossbred cows. However, HWBL (-0.378±0.140 to -0.458±0.137), HWGR (-0.305±0.147 to -0.369±0.143) and HWPG (-0.315±0.146 to -0.356±0.144) had negative and significant (P<0.01, P<0.05, P<0.05) association during the period of study. The positive association of PGIR was significant near calving while those of OD and BS beyond calving stage.

**With SLFT:** The correlation coefficients of BL (-0.295±0.147 to -0.370±0.143) showed negative association during the entire period. However, these were significant (P<0.05) only during pre-partum period. The findings assume practical importance for selecting rural H.F. crossbreds during advance pregnancy for higher fat yield in second lactation. HWBL had positive (0.315±0.146 to 0.478±0.136) and significant association during the entire 6 months period. It implies that cows with more RAW and less BL have more fat during second lactation. The BS showed sporadic negative (-0.306±0.147 to -0.414±0.140) but significant association with SLFT.

Kumar (1990) observed BL to be positively and significantly associated with FLMY, lactation length and peak yield and that of HAW, DHB and DPB as non-significant with FLMY. Mali et al. (1986) and El-Halawany et al. (1984) reported non-significant association of TFT with milk yield or fat per cent in Friesian or Jersey breeds. Prasad and Tomer (1998) reported negative association of BS with FCM, fat and SNF, and positive association with peak yield, 90 days and 180 days milk yields.

**ACKNOWLEDGEMENT**

Authors are grateful to the Vice Chancellor, Dean (VAsc.) and Director (Research), G.B. Pant University of Agriculture and Technology, Pantnagar for providing necessary facilities and for the farmers for their co-operation in collecting relevant information for completion of this study.
REFERENCES


