

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## MILK PRODUCTION EFFICIENCY: A NEW TRAIT FOR GENETIC IMPROVEMENT OF THE GUZERÁ DUAL-PURPOSE CATTLE

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Many herds have focused on improving traits that allow them to increase the economic efficiency of the dairy production system. For years, Brazilian breeders prioritized milk traits in their selection objective. However, traits such as the reproductive ones are very important for the productive performance, being related to herd life of a cow as well as to the incomes from the activity. This trait is also an indicator of possibility of the cows' premature disposal. Joint selection for both traits must be therefore considered. Thus, this study aimed at estimating genetic and environmental components for the aggregate trait called milk production efficiency (MPE) and expressed as the ratio between milk production (kg) and age at calving (month). Data came from the database of the National Improvement Program of Guzerá Dual-purpose Cattle. Records from 11,433 lactations of Guzerá primiparous and multiparous cows were used in the study. Data were previously submitted to descriptive statistical analyses for the evaluation of distribution pattern. Genetic and environmental parameters were obtained from the mixed model equation solutions using the derivative-free restricted maximum likelihood method available in the algorithms of the MTDFReML software. The statistical model in matrix notation was:  $y = Xb + Zu + e$ , where  $y$ =vector of observations;  $X$ =matrix of fixed effects (herd year, year period, and the covariate age at calving);  $b$ =vector relating fixed effects to observations;  $Z$ =matrix of genetic effects, including the relationship matrix;  $u$ =vector relating genetic effects to observations; and  $e$ =vector of residual effects. The new trait showed the normal distribution pattern in the descriptive analysis and the adjusted means of  $42 \pm 24$  kg milk month<sup>-1</sup>. The estimates for genetic, environmental, and residual variances were respectively 175.06, 14.41, and 178.91. The estimate of heritability for MPE was  $0.48 \pm 0.00$ . This value was considered high, revealing that the ability of early milk production is heritable and highlighting the possibility of successful selection for milk production efficiency in the Guzerá herds. Therefore selection for MPE can result in females with high genetic potential for milk production in early ages.

**Keywords:** economics, milk production, precocity, selection, zebu

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