



## Comparison of bivariate and multivariate joint analyses on the selection loss of beef cattle

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**ABSTRACT.** For genetic evaluation of beef cattle, univariate or bivariate analyses are often performed as an alternative to decrease the complexity of matrices and mathematical models compared to multivariate analysis, which considers a larger number of joint traits. The use of bivariate methods to calculate genetic predictors may cause bias in the estimation of breeding values and, as a consequence, reclassification of the rank of top-selected sires, resulting in a loss of genetic gain in future generations. The objective of this study was to compare the bivariate and multivariate joint methods of genetic evaluation, verifying the selection loss, and reclassification of the ranking of the best animals with different selection intensities. Records of 431,224 Nellore breed animals were evaluated for birth weight, weaning weight, post-weaning gain, muscle score, scrotal circumference, and selection index. The pedigree file consisted of 505,848 animals, including 218,727 males and

287,121 females. The predicted breeding values were obtained using the program PEST 2, and the complete pedigree analysis was performed by the PopReport software. The results showed that, for the four different selection intensities considered (TOP 10 and 1, 10, and 30%), selection loss and reclassification of animals in ranking, were detected for all traits evaluated when the two methods of analysis were compared.

**Key words:** Genetic evaluation; Breeding value; Selection index; Sire ranking; Beef cattle