

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## GENOMIC SELECTION FOR MEAT QUALITY TRAITS IN NELLORE CATTLE

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The objective of this study was to present accuracies of genomic selection (GS) for traits such as tenderness, lipids content, marbling, and meat color ( $a^*$ ,  $b^*$  and  $L^*$ ) in Nellore cattle. Data from uncastrated male animals, born between 2008 and 2014, belonging to four breeding programs (DeltaGen, Paint, Cia do Melhoramento and Qualitas) and slaughtered in commercial slaughterhouses with an average of  $701 \pm 88$  days of age, were used. A total of 5,000 animals with phenotypes and genotypes, and 412,000 SNPs, were available. The dataset was divided into two groups: (1) training group: included animals born from 2008 to 2013 (about 4,500 animals), used to estimate SNP effects, and (2) validation group: included animals born in 2014 (about 500 animals), used to predict direct genomic values (DGVs), based on the SNP effects estimated in the training group. A single-trait animal model was used to estimate heritability and to adjust the phenotype for fixed effect of contemporary group (year of birth, farm and management group at yearling), and covariables (age at slaughter and time between slaughter and physicochemical analysis). To predict SNP effects, BayesC $\pi$  method (parameter  $\pi$  fixed to 0.99) was applied using GS3 software (300,000 iterations, burn-in period of 50,000, taking sample every 10 iterations). The accuracies were calculated using Pearson's correlations between DGVs and adjusted phenotypes, divided by the square root of heritability of each trait (0.03 – 0.24). The DGV accuracies varied from 0.21 to 0.72, with the lowest accuracies estimated for traits associated with fat content (lipids=0.21 and marbling=0.29) and the greatest accuracies observed for meat color traits ( $a^*=0.40$ ,  $b^*=0.57$  and  $L^*=0.72$ ) and tenderness (0.60). Accuracy for tenderness was superior to those found in previous studies in Nellore breed, while for marbling it agrees with those from the literature for various breeds. Studies of GS for lipid and meat color traits are still scarce. Our results support the feasibility of implementation of genomic selection for meat quality traits in Nellore cattle.

**Keywords:** fat deposition, genomics, meat composition, meat tenderness.

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