



## Association of SNPs on CAPN1 and CAST genes with tenderness in Nellore cattle

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**ABSTRACT.** We examined whether single-nucleotide polymorphisms (SNPs) in the calpain (CAPN) and calpastatin (CAST) genes, described from *Bos primigenius taurus*, are polymorphic in Nellore cattle. We also looked for a possible association of linkage disequilibrium of this polymorphism with tenderness of the longissimus dorsi muscle after 7, 14 and 21 days of postmortem aging in 638 purebred Nellore bulls. Meat tenderness was measured as Warner-Bratzler shear force. Additive and dominance effects were tested for SNPs of the three genotypic classes; the substitution effect was tested for SNPs with missing genotypic classes. Genotypic and gene frequencies were also calculated for the different SNPs. An increase in tenderness was observed from 7 to 21 days; the average values for shear force at 7, 14 and 21 days of aging were  $5.92 \pm 0.06$ ,  $4.92 \pm 0.05$ , and  $4.38 \pm 0.04$  kg, respectively. All markers showed polymorphism, but there was no CC genotype for CAPN316, and few animals showed the AA genotype for CAPN530. The alleles CAPN4751, UOGCAST1, and WSUCAST were found to have additive and dominance effects for shear force at 7, 14 and 21 days, while CAPN316 showed a substitution effect for shear force at

7 and 21 days. An additive-by-additive epistatic interaction was observed between *CAPN4751* and markers on the *CAST* gene. In conclusion, these markers should be considered for use in breeding programs.

**Key words:** *Bos primigenius indicus*; Calpain; Calpastatin; TFAM; Meat quality