



# Association of CAPN1 316, CAPN1 4751 and TG5 markers with bovine meat quality traits in Mexico

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**ABSTRACT.** We examined allele and genotype frequencies for the molecular markers CAPN1 316, CAPN1 4751 and TG5, and determined whether they are associated with beef quality traits in Mexican cattle. One hundred and twenty-four longissimus dorsi muscle samples were collected from cattle from north, central and southern Mexico. CAPN1 316 and CAPN1 4751 frequencies were determined using the allelic discrimination assay and the TG5 marker was typed by PCR-RFLP. Meat quality traits included intramuscular fat content (IMF) and tenderness determined by Warner-Bratzler shear force (WBSF) at 24 h postmortem. The association test was made using a mixed model, including genotypes, genetic group, and sampling location as fixed effects. Least squares means and significant interactions were compared using least significant differences based on the mixed procedure. CAPN1 316 CC was found

at a low frequency (0.03) and has been reported as a favorable genotype associated with tenderness meat. Genotype frequencies for CAPN1 4751 were similar in favorable (CC) and unfavorable (TT) genotypes (0.26 and 0.28, respectively). The TG5 CC genotype had a frequency of 0.73, while the TT genotype frequency was 0.01. The means for WBSF and IMF were  $4.08 \pm 1.35$  kg and  $5.23 \pm 2.14\%$ , respectively. Sampling site and the CAPN1 316 genotypes significantly affected WBSF ( $P < 0.05$ ). Samples collected from Hermosillo, Sonora, had the lowest WBSF ( $P < 0.05$ ), while those collected in Veracruz were toughest (WBSF = 5.267 kg). The effect of GG and TG5 genotypes on IMF was significant ( $P < 0.05$ ). CAPN1 316 and TG5 markers were found to be significantly associated with beef quality traits and thus will be useful for Mexican beef characterization.

**Key words:** Molecular markers; Bovine meat quality; Intramuscular fat; Warner-Bratzler shear force; CAPN1; TG5