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A Calpastatin insertion/deletion polymorphism is associated with the myofibril fragmentation index in *Bos taurus* bulls .

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The objective of this experiment was to determine whether there was an association between single nucleotide polymorphisms (SNPs) in the Calpastatin gene and Myofibril Fragmentation Index (MFI) of muscle samples obtained from Senepol (n=12) and Charolais (n=14) crossbred bulls. Animals were genotyped for a cytosine insertion/deletion identified at intron 2 of the bovine Calpastatin locus (allele A = cytosine deletion; allele B = cytosine insertion) to determine its potential associations with MFI. Calves were weaned at 9 months (266.5 kg) and then raised under grazing conditions until harvest at 22 months (499.6 kg). From each bull, samples of the semimembranosus (SM), semitendinosus (ST), and longissimus (LD) muscle were collected and two subsamples were cut in 1 cm² pieces and homogenized using a Polytron® PT1600E homogenizer (30,000 RPM) in cold (4°C) homogenizing buffer (100 mM KCl; 7 mM KH₂PO₄; 18 mM K₂HPO₄; 1 mM EDTA; 1 mM NaN₃ [pH 7.0]). The Biuret reagent assay was used to determine SM, ST, and LD homogenates protein concentrations. All muscle homogenates were diluted to a constant protein concentration of 0.5 mg/mL of homogenization buffer. Subsequently, the absorbance of each muscle homogenate was determined at a specified wavelength of 540 nm (Thermo® Spectronic Genesys). Absorbance results were multiplied by 200 to determine MFI values. There was no interaction between muscle and genotype (P=0.397). Furthermore, homozygote animals for the allele labeled as A had higher MFI values (potentially more tender meat) than heterozygote animals (P=0.0452). Animals homozygote for the B allele were not observed. Because previous studies have associated higher MFI values with more tender meat, our data suggests that this Calpastatin polymorphism might be useful in animal selection due to its significant association with MFI in Senepol and Charolais crossbred bulls.

Key Words: Calpastatin, Beef Tenderness, MFI

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