

**New SNP in calpastatin gene associated with meat tenderness and frequency in different cattle breeds**

L.P. Iguácel<sup>1</sup>, J.H. Calvo<sup>1,2</sup>, J.K. Kirinus<sup>3</sup>, M. Serrano<sup>4</sup>, G. Ripoll<sup>1</sup>, I. Casasús<sup>1</sup>, M. Joy<sup>1</sup>, L. Pérez-Velasco<sup>1</sup>, P. Sarto<sup>1</sup>, P. Alberti<sup>1</sup> and M. Blanco<sup>1</sup>

<sup>1</sup>CITA, Avda. Montañana 930, 50059 Zaragoza, Spain, <sup>2</sup>ARAID, C/ María de Luna, 11, planta 1ª, 500018 Zaragoza, Spain, <sup>3</sup>Universidade Federal de Santa Maria, Av. Roraima, 1000, 97105-900, Santa Maria Brazil, <sup>4</sup>INIA, Crta. de la Coruña, km 7,5 28040 Madrid, Spain. [icasasus@aragon.es](mailto:icasasus@aragon.es)

Calpastatin (CAST) inhibits  $\mu$ - and m-calpain activity and, therefore, regulates post-mortem proteolysis, being some SNPs in CAST associated with meat tenderness. In this work, a new SNPs located at exon 7 (position BTA29: 98535683 on UMD 3.0) was associated with meat tenderness ( $P=0.001$ ) in Parda de Montaña cattle breed. The frequencies of this SNP were 45.8% AA, 45.1% AG and 9.0% GG. This mutation changes the amino acid sequence at position Thr182Ala and could affect the electrostatic charges localized in the interacting regions between the calpastatin L-domain and calpain. Moreover, heterozygous genotypes did not show differences with intermediate tenderness, indicating an autosomal recessive inheritance effect of the Thr182Ala mutation for this trait. The effect of the genotype of the Thr182Ala mutation on tenderness was higher (0.84 SD) than the effect of other SNPs found in the CAST gene. Furthermore, samples of different cattle breeds (Parda de Montaña, Pirenaica, Bruna dels Pirineus and Holstein-Friesian) were collected to study the frequency of this new variant, finding similar genotype frequencies in these breeds. Furthermore, the alignment of the sequences of CAST deposited in the GenBank database revealed that this new variant was present in domestic cattle (*Bos taurus*; Hereford breed) and in Yak (*Bos grunniens*). Functional studies are necessary to test the effect of the CAST Thr182Ala genotypes on calpastatin activity to confirm the effects of this new polymorphism found in the current work.