Genetic diversity of myostatin and calpastatin genes in Zandi sheep

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Myostatin (MSTN) is an inhibitor of skeletal muscle growth, and a mutation in the gene coding region leads to increased muscling. Calpastatin (CAST) is a specific inhibitor of the ubiquitous calcium-dependent proteases, \( \mu \)-calpain and \( m \)-calpain, found in mammalian tissues. In this study, genomic DNA was extracted from Zandi sheep blood samples. Gel monitoring and spectrophotometer methods were used to determine the quality and quantity of DNA. Exon 3 of myostatin gene and intron 1 from L domain of the ovine calpastatin gene were amplified to produce 733 and 226 bp fragments, respectively. The PCR products obtained for the myostatin (MSTN) and calpastatin (CAST) genes were digested by the restriction endonuclease enzymes HhaIII and MspI, respectively. The digested products were separated by electrophoresis on 1% agarose gel and visualized after staining with GelRed on UV transillumination. The HhaIII digestion of the PCR products produced digestion fragments of 321, 18 and 131 bp. The MspI digestion produced fragments of 682 and 633 bp. Data analysis was conducted using PopGen software. In this population, mm genotype and AA, AB and BB genotypes were identified with %0.01 and 63, 06% frequencies for MSTN and CAST genes, respectively. This sheep population was in Hardy-Weinberg equilibrium for the CAST gene. The polymorphism found in the CAST gene may be helpful in selection programs for genetic improvement of meat traits. However, before application in the genetic improvement of the indigenous sheep breeds, the association of these polymorphisms with meat traits needs to be established in these breeds.

Keywords: Myostatin, calpastatin, polymorphism, Zandi sheep

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