



A novel SNP of the C/EBP α gene associated with superior meat quality in indigenous Chinese cattle

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Genet. Mol. Res. 10 (3): 2069-2077 (2011)
Received August 8, 2010
Accepted May 17, 2011
Published September 16, 2011
DOI <http://dx.doi.org/10.4238/vol10-3gmr1032>

ABSTRACT. CCAAT/enhancer-binding protein alpha (C/EBP α) is an essential transcriptional factor regulating the differentiation of adipocytes. We report a novel single nucleotide polymorphism (C271A) of the C/EBP α gene in six indigenous Chinese cattle breeds using PCR-SSCP and DNA sequencing methods. Allele frequencies were investigated and evaluated by the χ^2 test in 817 individuals; all populations were found to be in Hardy-Weinberg equilibrium. Gene heterozygosity, effective allele numbers and polymorphism information content of the C/EBP α locus varied from 0.50 to 0.54, 1.84 to 1.99 and 0.35 to 0.37, respectively. We also evaluated a potential association of the C/EBP α SNP with ultrasound traits in 555 individuals; individuals of the AA genotype had greater ultrasound backfat thickness than did genotype CC (0.36 versus 0.34 cm, $P < 0.01$); genotypes AA and CA had higher ultrasound marbling scores than did genotype CC (3.53, 3.52 versus 3.37, $P < 0.05$). Analysis based on meat quality data in another 204 Qinchuan cattle showed that animals with genotype AA had bigger loin eye areas than did genotype CA (87.10 versus 79.08 cm², $P < 0.05$).

These results indicate that the C271A SNP of the C/EBP α gene could be used as a molecular marker for selecting beef cattle with superior carcass traits.

Key words: Bovine C/EBP α gene; Genetic polymorphism; PCR-SSCP; Meat quality traits