



Four SNPs of insulin-induced gene 1 associated with growth and carcass traits in Qinchuan cattle in China

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ABSTRACT. The insulin-induced gene 1 (Insig-1) is a regulator of lipid metabolism and plays an important role in the sterol-mediated regulation of SREBP, SCAP and HMG-CoA reductase. We used PCR-RFLP and DNA sequencing to detect polymorphisms of the Insig-1 gene in 215 individuals of the Qinchuan cattle breed. Four SNPs [4366(A>G), 4534(T>C), 5001(T>C), and 5235(G>A)] were identified. The association of the genetic variation with growth and carcass traits (body length, withers height, hip width, slaughter weight, and carcass weight) was analyzed. The individuals with better performance had the GG genotype at locus A4366G, and CC genotypes at locus T4534C and locus T5001C. These could be used for beef cattle breeding improvement in China. Additionally, linkage disequilibrium analysis reflected that all mutations were in low linkage disequilibrium with each other. We concluded that polymorphisms in the Insig-1 gene are associated with growth and carcass traits and could be used for marker-assisted selection and management in beef cattle breeding programs.

Key words: Insig-1; Qinchuan cattle; Association analysis; SNPs