

Article

Animal Breeding and Genetics

Asian-Australasian Journal of Animal Sciences 2008;21(8): 1073-1079.

DOI: <https://doi.org/10.5713/ajas.2008.70673> Published online July 1, 2008.

A New Single Nucleotide Polymorphism in the IGF-I Gene and Its Association with Growth Traits in the Nanjiang Huang Goat

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Abstract

The objectives of this study were to identify polymorphisms of insulin-like growth factor I (IGF-I) gene and to investigate their association with growth traits in Nanjiang Huang goats. Five hundred and ninety-two animals were used to detect the polymorphisms in the complete coding sequence, part of introns and the 5' regulatory region of the IGF-I gene by means of PCR-SSCP. A new single nucleotide polymorphism (G to C transversion) was identified at intron 4 of the IGF-I gene in the goats. Two alleles and three genotypes were observed in this group. The frequency of G and C alleles was 54.6 and 45.4%, respectively. The statistical analysis showed that polymorphism of the IGF-I gene had a significant association ($p < 0.05$) with birth weight (BW), body weight at 6 months (W6) and at 12 months (W12), heart girth at 2 months (G2), body length at 6 months (L6), wither height at 6 months (H6) and at 12 months (H12) and heart girth at 12 months (G12). The goats with genotype CC had significantly higher BW, W6, W12, G2, L6, H6, H12 and G12 than those with genotype GC and had significantly higher W12, H6, H12 and G12 than those with genotype GG. Therefore, genotype CC may be the most advantageous for growth traits in the Nanjiang Huang goat. However, no significant association between SNP genotypes and other growth traits was observed. These results indicated that the SNP marker of the IGF-I gene may be a potential molecular marker for growth traits in Nanjiang Huang goats.

Keywords: Nanjiang Huang Goats; Insulin-like Growth Factor I; Polymorphism; Growth Traits; PCR-SSCP
