



Molecular cloning and characterization of *KISS1* promoter and effect of *KISS1* gene mutations on litter size in the goat

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ABSTRACT. Kisspeptins, the product of the *KISS1* gene, play an essential role in the regulation of reproductive functions, acting primarily at the hypothalamic level of the gonadotropic axis. We detected polymorphisms of the goat *KISS1* gene in 723 individuals from three goat breeds (Xinong Saanen, Guanzhong, and Boer) by DNA pooling, PCR-RFLP, and DNA sequencing methods. We cloned the promoter sequence of this gene and found it to share high similarity with that of the bovine *KISS1* promoter. Six TATA boxes were found in the goat *KISS1* promoter region. Two novel SNPs (g.2124T>A and g.2270C>T) were identified in the intron 1 of the *KISS1* gene of all three goat breeds. The three goat breeds were in Hardy-Weinberg disequilibrium at g.2124T>A and g.2270C>T loci. The g.2124T>A and g.2270C>T loci were closely linked in the three goat breeds ($r^2 > 0.33$). The g.2124T>A and g.2270C>T SNPs were significantly associated with litter size, and the C1 female goats had a larger litter size than did those with the other genotypes. These results extend the spectrum

of genetic variation of the goat *KISS1* gene, which contributes to our knowledge of goat genetic resources for breeding programs.

Key words: Combined genotype; SNP; PCR-RFLP; Goat