



# Polymorphisms of the bovine growth differentiation factor 9 gene associated with superovulation performance in Chinese Holstein cows

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**ABSTRACT.** Growth differentiation factor 9 (GDF9) belongs to the transforming growth factor  $\beta$  superfamily and plays a critical role in ovarian follicular development and ovulation rate. We examined the bovine *GDF9* gene polymorphism and analyzed its association with superovulation performance. Based on the sequence of the bovine *GDF9* gene, six pairs of primers were designed to detect single nucleotide polymorphisms of two exons and intron 1 of *GDF9* using polymerase chain reaction-single-strand conformation polymorphism. Only the products amplified by primer 3-1 displayed polymorphisms. Sequencing revealed two mutations of A485T and A625T in intron 1 of the *GDF9* gene in 171 Chinese Holstein cows treated for superovulation. Association analysis showed that these two single nucleotide polymorphisms of A485T and A625T had significant effects

on the number of transferable embryos ( $P < 0.05$ ), and the A625T polymorphism was significantly associated with the total number of ova ( $P < 0.05$ ). In addition, a significant additive effect on the number of transferable embryos was detected in polymorphisms of A485T ( $P < 0.05$ ). This study is the first to identify two polymorphisms in bovine *GDF9* and describe their correlation with superovulation traits in Chinese Holstein cows.

**Key words:** Chinese Holstein cows; Polymorphism; Superovulation; Growth differentiation factor 9