Relationship between polymorphisms in exon 10 of FSHR gene and litter size in swine

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ABSTRACT. Follicle-stimulating hormone (FSH), a glycoprotein secreted by the anterior pituitary, can regulate ovarian function through the FSH receptor (FSHR). To evaluate the effects of the FSHR gene on reproductive traits in pigs, polymorphisms in exon 10 of the FSHR gene were observed by polymerase chain reaction-single-strand conformation polymorphism, and 3 single nucleotide polymorphisms (C1491T, G1885A, and C1977T) in exon 10 of the porcine FSHR gene, and 3 genotypes (AA, AB, and BB) for C1491T and 2 haplotypes (D and E) for G1885A and C1977T were identified. Further analysis of single nucleotide polymorphism genotypes associated with reproductive traits including total number born (TNB) and number born alive (NBA) was carried out in 3 pig populations including Berkshire, Wannan Black (a Chinese indigenous pig breed), and BW pigs (two-way crossbred pigs produced from Berkshire ♂ and Wannan Black pig ♀). The results showed that the TNB and NBA of Wannan Black pigs with the AB genotype were significantly higher than in AA genotype sows (P < 0.01)
in multiparity sows and all parities. The TNB and NBA of Berkshire pigs with the DE genotype were significantly higher than the DD and EE genotype sows (P < 0.01) in gilts, sows and all parities. Overall, TNB and NBA from the 3 identified genotypes was DE > DD > EE. The results showed that polymorphisms in exon 10 of the FSHR gene had a significant effect on litter size traits of Wannan Black and Berkshire pigs. These results can be applied for marker-assisted selection in the 2 swine breeds.

**Key words:** Follicle-stimulating hormone receptor; Polymorphism; Number born alive; Pig; Total number born