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## Association of Polymorphisms of Chicken Adipose Differentiation-related Protein Gene with Carcass Traits

[Xiaoling Zhao](#)<sup>1)</sup>, [Yiping Liu](#)<sup>1)</sup>, [Xiaosong Jiang](#)<sup>2)3)</sup>, [Huarui Du](#)<sup>2)3)</sup> and [Qing Zhu](#)<sup>1)</sup>

1) College of Animal Science and Technology, Sichuan Agricultural University, China

2) Sichuan Animal Science Academy, China

3) Sichuan Daheng Poultry Breeding Company, China

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Adipose differentiation-related protein (ADFP) plays an important role in regulating lipid storage and affecting body fat distribution. The objective of the current research was to identify the polymorphisms in chicken *ADFP* gene and their associations with carcass traits. We screened all coding sequence and part of introns (totally 2155bp) of the *ADFP* gene by using single strand conformation polymorphism method in individuals from Sanhuang chicken, Mountainous Black-bone chicken and a commercial crossbred chicken (totally 427 birds). Three novel single-nucleotide polymorphisms were found in intron 4 (SNP1), intron 5 (SNP2) and exon 8 (SNP3), respectively. The association analyses showed that genotypes of SNP1 were significantly associated with abdominal fat weight and percentage of abdominal fat ( $P < 0.05$ ), genotypes of SNP2 were significantly associated with breast muscle weight and percentage of abdominal fat ( $P < 0.05$ ), and the main haplotype/haplotypes combination (their frequencies were higher than 5%) were marginally significantly associated with breast muscle weight, abdominal fat weight, and percentage of abdominal fat ( $0.05 < P < 0.1$ ). Haplotype H2 (A-C-A) was an advantageous haplotype for breast muscle weight and H5 (T-C-G) was an advantageous haplotype for weight and percentage of abdominal fat. Conversely, H3H3 (A-T-G/A-T-G) was a disadvantage haplotype combination for accumulation of abdominal fat. These results suggested that polymorphisms of *ADFP* gene were associated with carcass traits, especially with fatness traits. *ADFP* is a potential major gene or in close linkage disequilibrium with the QTL

affecting fatness traits in chickens.

**Keywords:** [adipose differentiation-related protein](#), [carcass traits](#), [chicken](#), [fat](#), [polymorphism](#)

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