



Novel SNPs in the growth arrest and DNA damage-inducible protein 45 alpha gene (*GADD45A*) associated with meat quality traits in Berkshire pigs

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ABSTRACT. This study was conducted to evaluate the porcine gene *GADD45A* (*growth arrest and DNA-damage-inducible protein 45 alpha*) as a positional candidate controlling quantitative trait loci (QTL) for meat quality traits on chromosome 6 (SSC6). Four exons of the porcine *GADD45A* gene were defined from cDNA and BAC clone sequences. A total of 4 single nucleotide polymorphisms (SNPs) were identified in porcine *GADD45A*. The association of these SNPs (g.196A>G, g.392C>A, g.955T>C and g.3247A>T) with meat quality traits was evaluated in 678 Berkshire pigs. The genotype distribution of only one SNP (g.3247A>T) conformed to Hardy Weinberg equilibrium in the pig population analyzed in this study, and the other SNPs were not in Hardy-Weinberg equilibrium. All four SNPs were significantly associated with meat quality traits. Three SNPs (g.196A>G, g.392C>A,

and g.955T>C) showed similar significant association patterns for drip loss, cooking loss, meat color (lightness; MC_L and yellowness; MC_B), shear force and water-holding capacity traits. By contrast, g.3247A>T had a different association pattern with other traits such as intramuscular fat content (IMF) and backfat thickness (BF), drip loss, MC_L, and moisture. These findings will provide useful information for genetic characterization or association studies in other pig populations. Additionally, these markers can potentially be applied in pig breeding programs to improve meat quality traits, including IMF and BF.

Key words: Meat quality; Pig; Single nucleotide polymorphism; Growth arrest and DNA-damage-inducible protein 45 alpha gene