



Novel polymorphisms of the *PRKAG2* gene and their association with body measurement and meat quality traits in Qinchuan cattle

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ABSTRACT. Body measurement and meat quality traits play important roles in the evaluation of productivity and economy in cattle, which are influenced by genes and environmental factors. *PRKAG2*, which encodes the $\gamma 2$ regulatory subunit of AMPK, is associated with key metabolic pathways in muscle. We detected bovine *PRKAG2* gene polymorphisms and analyzed their associations with body measurement and meat quality traits of cattle. DNA samples were taken from 578 Qinchuan cattle aged 18-24 months. DNA sequencing, polymerase chain reaction-restriction fragment length polymorphism, and time-of-flight mass spectrometry were used to detect *PRKAG2* single nucleotide polymorphisms (SNPs). Sequence analysis revealed three SNPs in exon 3 (g.95925G>A, g.95973G>C, and g.95992A>G) and

one g.96058T>C mutation in intron 3. g.95973G>C, g.95992A>G, and g.96058T>C each showed 3 genotypes: GG, GC, and CC; AA, AG, and GG; and TT, TC, and CC, respectively. In contrast, g.95925G>A only showed 2 genotypes, GG and GA. Analysis showed that g.95925G>A had no effects on body measurement and meat quality traits, whereas the other 3 polymorphisms were significantly associated with some of the body measurement and meat quality traits in the Qinchuan cattle population. It is inferred that the *PRKAG2* gene can be used for marker-assisted selection to improve the body measurement and meat quality traits in the Qinchuan cattle population.

Key words: Body measurement traits; Meat quality traits; *PRKAG2*; Qinchuan cattle; Single nucleotide polymorphism