

ABSTRACT

**Allele Frequency Distribution in PNLIP Promoter SNP Is Different between High-Marbled and Low-Marbled Japanese Black Beef Cattle**

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Marbling defined by the amount and distribution of intramuscular fat is regarded as an economically important trait of beef cattle in Japan. The pancreatic lipase gene (*PNLIP*) is located within the genomic region of a bovine marbling quantitative trait locus. The rat homologue of *PNLIP* has been previously shown to be regarded as a possible candidate for the gene responsible for intramuscular fat content. These findings suggested that *PNLIP* was a positional and functional candidate for the marbling gene. In this study, we detected a single nucleotide polymorphism (SNP), g.37288470A > G, at 1917 bp upstream of the *PNLIP* transcription initiation site between Holstein steers and somatic nuclear-derived cloned steers from a Japanese Black sire with a very high estimated breeding value for marbling by sequencing analysis. Further, we found statistically significant difference in the allelic distribution of the SNP between 17 Japanese Black unrelated sires with extremely high predicted breeding values for marbling and 17 sires with extremely low ones ( $P = 0.0332$ ). Our findings suggest that g.37288470A > G SNP in the promoter region of *PNLIP* might be associated with marbling by altering its gene expression, and be useful for effective marker-assisted selection to increase the levels of marbling in Japanese Black beef cattle.

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