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ABSTRACT

The T allele at the g.1471620G>T in the EDG1 gene associated with high marbling in Japanese Black cattle is at a low frequency in breeds not selected for marbling

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Our previous study detected a single nucleotide polymorphism (SNP), g.1471620G>T, in the 5' flanking region of the endothelial differentiation sphingolipid G-protein-coupled receptor 1 (EDG1) gene, which has been considered as a positional functional candidate for the gene responsible for marbling, and showed association of the g.1471620G>T SNP with marbling in Japanese Black beef cattle. In the present study, we investigated the allele frequency distribution of the g.1471620G>T SNP among the 5 cattle breeds, Japanese Black, Japanese Brown, Japanese Short Horn, Holstein, and Brown Swiss breeds. The T allele at the g.1471620G>T SNP associated with high marbling was found at high frequency in Japanese Black breed that has been subjected to a strong selection for high marbling, while the allele was absent or at very low frequencies in the other breeds that have not been strongly selected for high marbling. Based on this finding, we hypothesized that the pressure of the strong selection for high marbling in Japanese Black breed has increased the frequency of the T allele at the g.1471620G>T SNP in the EDG1.