

ABSTRACT

Association of the expression levels in the skeletal muscle and a SNP in the CDC10 gene with growth-related traits in Japanese Black beef cattle

B Tong¹, G P Li, S Sasaki, Y Muramatsu, T Ohta, H Kose, T Yamada

¹Department of Agrobiological, Faculty of Agriculture, Niigata University, Nishi-ku, Niigata, 950-2181, Japan.

Growth performance, as well as marbling, is the main breeding objective in Japanese Black (JB) cattle, the major beef breed in Japan. The septin 7 (CDC10) gene, involved in cellular proliferation, is located within a genomic region of a quantitative trait locus for growth-related traits. In this study, we first showed that the expression levels of the CDC10 gene in the skeletal muscle were higher in JB steers with extremely high growth performance than in JB steers with extremely low growth, using real-time PCR. Further, a single nucleotide polymorphism (SNP), NC_007302.5:g.63264949G>C, was detected in the promoter region of the CDC10 gene and genotyped in three Japanese cattle breeds (known as 'Wagyu' in Japan) and the Brown Swiss dairy cattle breed. All four cattle populations showed a moderate genetic diversity at the SNP of the CDC10 gene. An association analysis indicated that the SNP was associated with growth-related traits in JB cattle. These findings suggest possible effects of the expression levels in the skeletal muscle and the SNP of the CDC10 gene on growth-related traits in JB cattle. The CDC10 SNP may be useful for effective marker-assisted selection to increase beef productivity in JB beef cattle.