

ABSTRACT

Effects of GH gene polymorphism and sex on carcass traits and fatty acid compositions in Japanese Black cattle

Astrid ARDIYANTI,¹ Yoshie OKI,¹ Yoshihito SUDA,⁴ Keiichi SUZUKI,² Koichi CHIKUNI,³ Yoshiaki OBARA¹ and Kazuo KATO¹

Departments of ¹ Animal Physiology and ² Animal Breeding and Genetics, Graduate School of Agricultural Science, Tohoku University, Aoba, Sendai, ³ National Institute of Livestock and Grassland Science, Tsukuba, Ibaraki, and ⁴ School of Food, Agricultural, and Environmental Science, Miyagi University, Hataate, Taihaku, Sendai, Japan

To investigate the effects of bovine growth hormone (bGH) gene polymorphism on carcass traits and fatty acid compositions in Japanese Black cattle caused by nucleotide substitution of CTG (allele A)/GTG (allele B) at codon 127 and of ACG (allele A and B)/ATG (allele C) at codon 172 of bGH, GH genotypes of 135 cattle were determined using allele specific-multiplex polymerase chain reaction (PCR). Allele A gave greater rib thickness and lower melting point of fat (MP) while allele B gave higher C18:1% ($P < 0.05$). Allele C gave higher C18:1, monounsaturated fatty acid (MUFA), unsaturated fatty acid (USFA) percentages ($P < 0.05$). It also gave lower saturated fatty acid (SFA) percentages, higher MUFA/SFA and USFA/SFA ratios, and lower MP ($P < 0.05$). Interactions of sex and GH alleles were analyzed. In heifers, allele A gave higher carcass weight, daily carcass gain, rib eye area, rib thickness, subcutaneous fat thickness, and BMS while allele B gave greater rib eye area and rib thickness ($P < 0.05$). Allele C gave higher C18:1 ($P < 0.01$), MUFA ($P < 0.01$), USFA percentages ($P < 0.05$) and MUFA/SFA and USFA/SFA ratios ($P < 0.01$), and lower C16:0 and SFA percentages ($P < 0.05$) and MP ($P < 0.01$). GH gene polymorphism affected carcass traits and fatty acid compositions although the effects were more pronounced in heifers.

END