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) and MUFA/SFA and USFA/SFA ratios (P < 0.01), and lower saturated fatty acid (SFA) percentages, higher C18:1, MUFA percentages (P < 0.01), and MP (P < 0.01). 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.