

ABSTRACT

Identification and utilization of genes associated with beef qualities

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The fatty acid composition of adipose tissue in beef has been recognized as an important trait because of its relationship with beef quality, including favorable beef flavor and tenderness. Over the last decade, we have tried to identify the genes responsible for the fatty acid composition in cattle, and have found the following. (i) Genetic polymorphism of stearoyl-CoA desaturase (SCD) is one of the responsible genes associated with fatty acid composition. The average effects of gene substitution of the SCD type A gene on the monounsaturated fatty acid (MUFA) percentage and the melting point of intramuscular fat were approximately +1.0% and -1.0°C, respectively. (ii) Intron polymorphism of sterol regulatory element binding protein-1 (SREBP-1) also affected MUFA. (iii) No effect of SCD or SREBP-1 genotypes on any representative carcass traits of Japanese Black in the field population was observed. (iv) Additional genetic markers adipocytes fatty acid binding protein 4 (FABP4) and liver X receptor α also affected the fatty acid composition. (v) SCD and FABP4 significantly affected fatty acid composition in Holstein steers. These findings will bring new insight into the fat-related carcass traits of beef cattle and will thus contribute to the beef industry.

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