

ABSTRACT

Contributions of FASN and SCD gene polymorphisms on fatty acid composition in muscle from Japanese Black cattle

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The fatty acid synthase (FASN) and stearoyl-CoA desaturase (delta-9-desaturase) (SCD) genes affect fatty acid composition. This study evaluated the contributions of polymorphisms of these genes on fatty acid composition in muscle in two different populations: 1189 and 1058 Japanese Black cattle from the Miyagi and the Yamagata populations respectively. We sampled intramuscular fat from the longissimus thoracis muscle in the Miyagi population and from the trapezius muscle in the Yamagata population. The collective contributions of FASN and SCD polymorphisms to total additive genetic variance for oleic acid were 13.46% in the Miyagi population and 16.29% in the Yamagata population and to phenotypic variance were 5.45% and 6.54% respectively. Although the individual effects of FASN and SCD polymorphisms on fatty acid composition were small, overall gene substitution may effectively improve fatty acid composition. In addition, we found that gene polymorphism contributions of fatty acids varied by population even in the same breed.