

**DGAT1, a new positional and functional candidate gene for intramuscular fat deposition in cattle**

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**Abstract:**

Intramuscular fat content, also assessed as marbling of meat, represents an important beef quality trait. Recent work has mapped a quantitative trait locus (QTL) with an effect on marbling to the centromeric region of bovine chromosome 14, with the gene encoding thyroglobulin (TG) being proposed as a positional and functional candidate gene for this QTL. Recently, the gene encoding diacylglycerol O-acyltransferase (**DGAT1**), which also has been mapped within the region of the marbling QTL, has been demonstrated to affect the fat content of milk. In the present study, the effects of a 5'-polymorphism of TG and of a lysine/alanine polymorphism of **DGAT1** on the fat content of musculus (m.) semitendinosus and m. longissimus dorsi in 55 bovine animals (28 German Holstein and 27 Charolais) has been investigated. Significant effects were found for both candidate genes in both the breeds. These effects seem to be independent of one another because the alleles of the two polymorphisms showed no statistically significant disequilibrium. The **DGAT1** effect is mainly on the m. semitendinosus. The TG polymorphism only affects m. longissimus dorsi. However, both intramuscular fat enhancing effects seem to be recessive. The possibility of two linked loci, acting recessively on intramuscular fat content, will require special strategies when selecting for higher marbling scores.

**Author Keywords:**

cattle, chromosome 14, **DGAT1**, intramuscular fat, marbling, TG