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RELATIONSHIP BETWEEN GENE EXPRESSION OF STEAROYL-COA DESATURASES (SCD1 & SCD5) AND THE FATTY ACID PROFILE IN ADIPOSE TISSUE OF CATTLE BREEDS IN THE BASQUE REGION

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In recent years, there has been an increasing concern of consumers regarding the amount and type of fat in the diet. The negative implications of specific fatty acids (FAs) are well known (Saturated FAs), while some kinds of monounsaturated and polyunsaturated FAs have been recognized as beneficial for human health. Previous studies have associated polymorphisms in SCD1 (stearoyl-CoA 9-desaturase) lipogenic gene with FA profile in beef cattle. Recently a novel isoform SCD5, described in brain and mammary gland, has been related with the saturated to unsaturated FA ratio in milk. In addition, polymorphisms in SREBP1, a key transcription factor gene that regulates SCD1, have been also associated with fat composition. Therefore, it seems that gene expression of bovine SCD and SREBP1 could provide new insights of lipogenic pathways and their relationship to fat composition in cattle. Thus, the objectives of the present study were 1) to determine the correlations between SREBP1 and SCD isoforms, and 2) to determine any correlation between gene expression of SCD isoforms (SCD1 & SCD5) and fatty acid profile in adipose tissue of 160 samples from bovine breeds (Pirenaica, Salers and Friesian) from the Basque Country. Quantitative PCR (qPCR) was performed with TaqMan probes and 98 fatty acids were obtained by GC/FID using a SP2560 column (100m). These results highlight a potential association between both SCD isoforms; when SCD1 is high, SCD5 is low, and vice versa. A positive correlation between SCD1 and SREBP1 ($P \leq 0.001$) was confirmed, whereas novel SCD5 seems to be regulated by SREBP1 depending on breed. Moreover, although SCD1 expression was higher in Pirenaica, cis monounsaturated FAs were similar in Pirenaica and Salers. These results could be associated to factors like concentrate feeding or potential higher expression of SCD5 in Salers, although these results showed be confirmed in a controlled feeding survey.