

# ASSESSMENT OF PUNCTUAL $\Delta^9$ -DESATURASE ACTIVITY IN PORCINE ADIPOSE TISSUE

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## Introduction

- Stearoyl-CoA desaturase activity is often measured through the monounsaturated /saturated fatty acids ratio of adipose tissue. This value is the result of the whole of anabolic and catabolic lipid processes that happened throughout the entire life of the animal and does not reflect the activity at a given time. Moreover, this value is masked by fatty acids deposited directly from the diet.
- To evaluate the punctual activity of the stearoyl-CoA desaturase enzyme (SCD) an experiment was carried out by adding deuterium-labelled stearic acid (C18:0D35) to the diet.

## Material and methods

- 48 pigs of two physiological phases, 24 of  $27.96 \pm 3.6$  kg BW and 24 of  $87.40 \pm 5.9$  kg BW were used. Each phase was constituted by 8 entire F2 (Pietrain ♂ x Duroc x Landrace) ♀ and 16 castrated purebred Duroc pigs, 8 CC/ 8 TT for the SCD genotype (g.2228T>C polymorphism in the promoter of the SCD responsible for enhanced biosynthesis of oleic acid by desaturating stearic acid).
- Each genotype was subdivided in 2 groups that were fed for 7 days with 2 levels of crude protein [15% low protein (LP); 17% normal protein (NP)] for the growing pigs and [13% (LP); 15% (NP)] for the fattening ones. A 0.029% of C18:0D35 was incorporated in all diets. Blood samples were collected daily for 5 days before culling and subcutaneous adipose was sampled after culling.
- The quantification of fatty acid profiles was performed by gas-liquid chromatography.
- The enrichment in deuterated fatty acids was analysed by an MRM method using a UPLC/XevoTQS mass spectrometer.

Figure 1. Plasmatic enrichment in deuterated stearic fatty acid during the three days prior to slaughter.

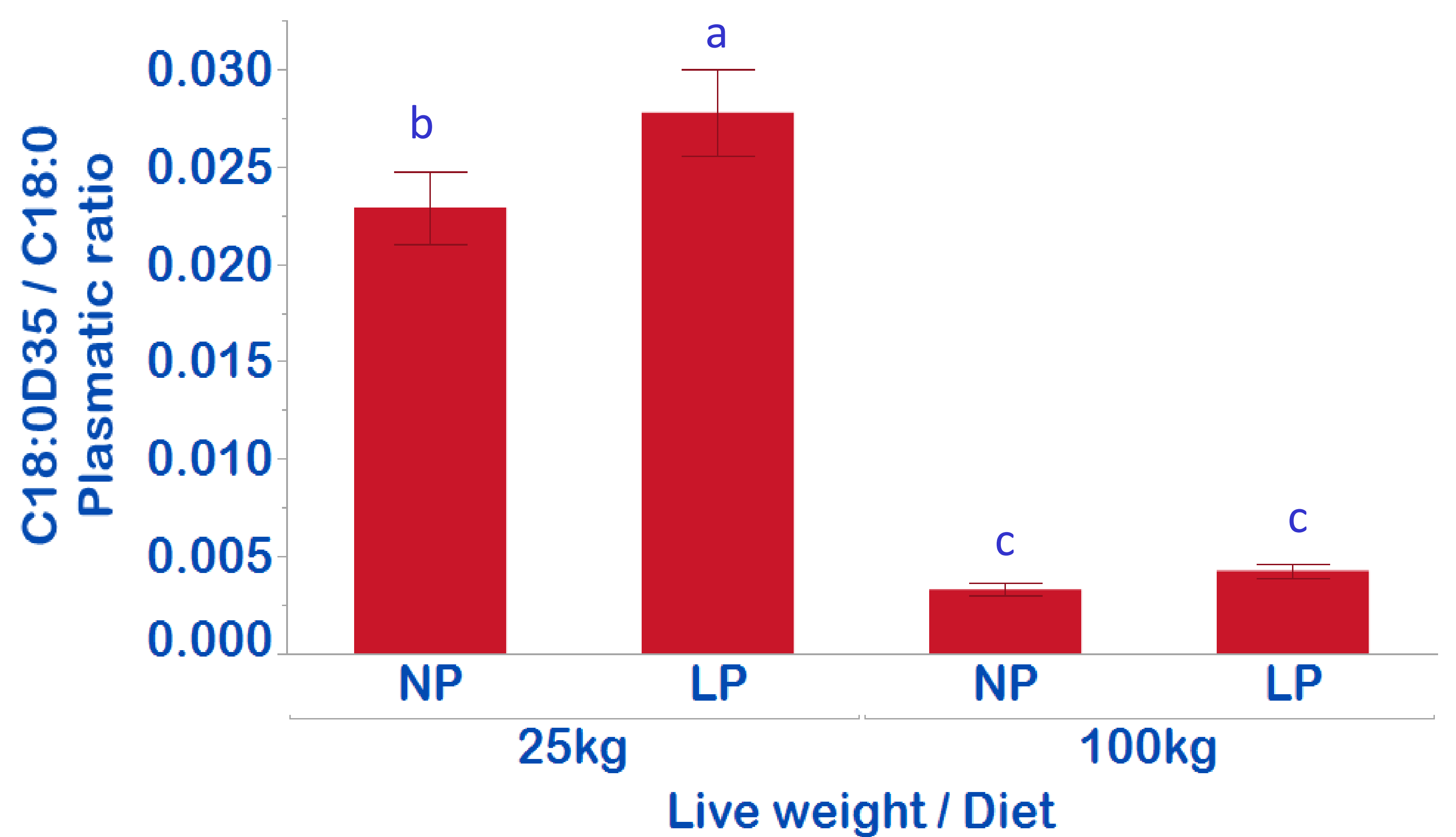
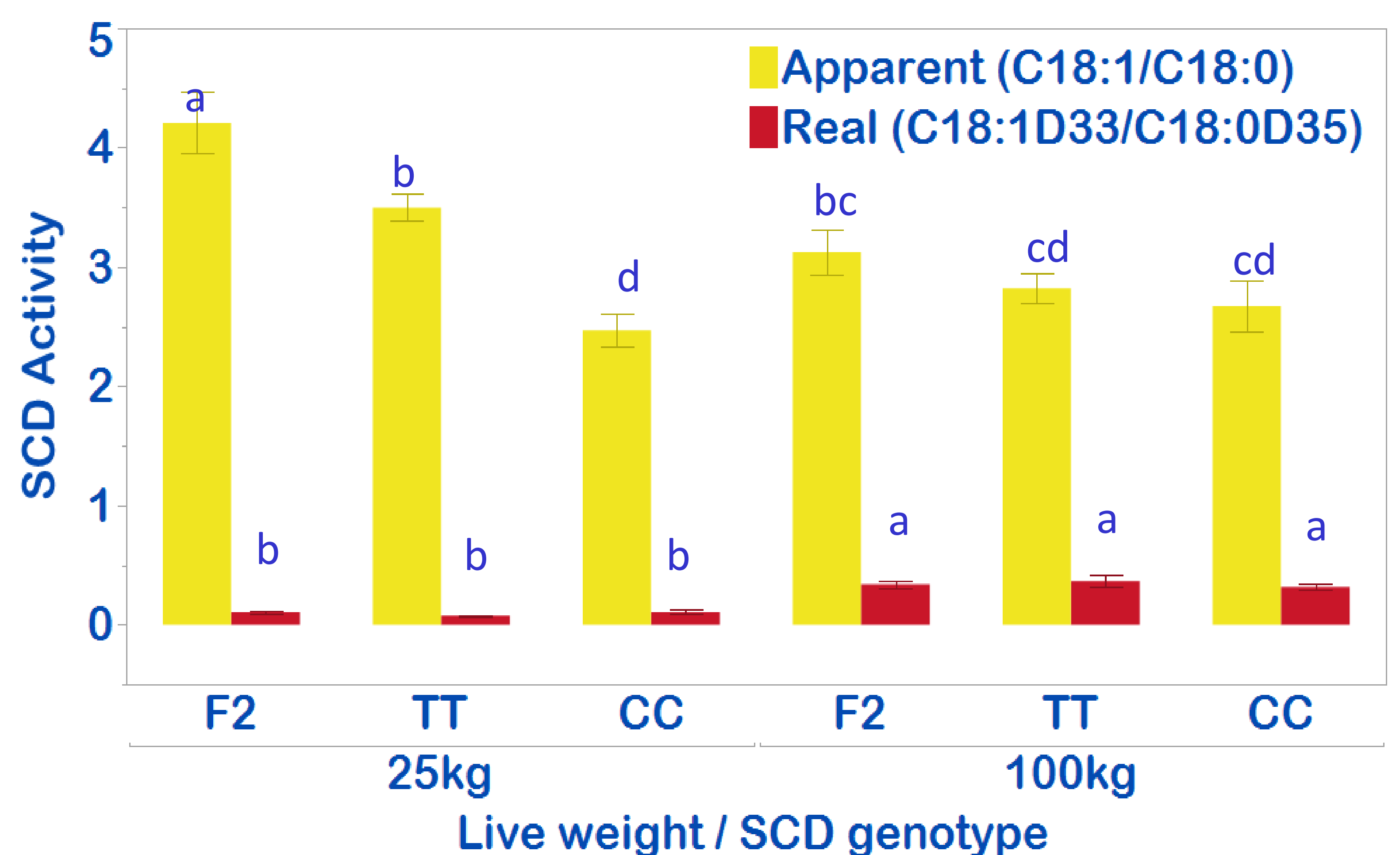


Figure 2. Backfat SCD activity measured as C18:1 / C18:0 ratio.



## Results and discussion

- In the three days prior to slaughter, the enrichment in deuterated stearic acid in blood plasma (Figure 1) was stable and it was almost 7 times higher in the 25 kg live weight pigs than in the 100 kg live weight pigs.
- Differences between genotypes in the apparent SCD activity of the subcutaneous adipose tissue (Figure 2), have been only found in the 25 kg live weight animals.
- The real SCD activity (Figure 2) in backfat was not affected by the studied genotype and was 3.5 times higher in the 100 kg live weight pigs than in those of 25 kg.

## Conclusion

As animal grows, the activity of the SCD enzyme in the subcutaneous adipose tissue increases. However, the effect of the studied SCD polymorphism on the ratio oleic /stearic fatty acids has only been observed in young animals at 25 kg live weight.

