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Relationship between *Longissimus thoracis et lumborum* muscle chemical fat and intramuscular adipocytes diameter obtained by computer image analysis

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Background

The loin intramuscular fat, or marbling, has been associated with meat characteristics that are in accordance with consumer preferences and some reports highlighted their relation.
On other hand as fat is an important tissue in the mature ewe, the intramuscular fat depot can be used as an indicator of fat body reserves

Objectives

Our objective was to establish a relationship between *Longissimus thoracis et lumborum* muscle (LM) intramuscular fat and the intramuscular adipocytes diameter (AD)

Results

The results showed positive correlation between intramuscular AD and the amount of LM intramuscular fat (Figure 2).

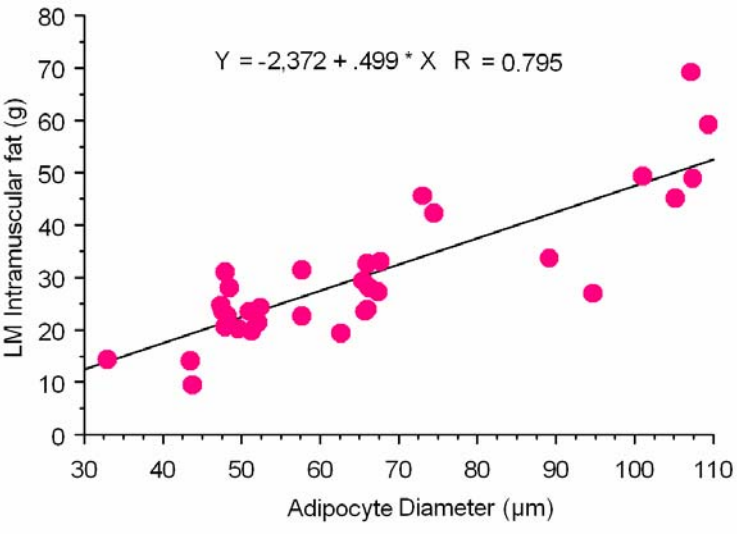

Figure 2 The relationship between *Longissimus thoracis et lumborum* muscle (LM) intramuscular fat and the adipocyte diameter.

Conclusions

From the current data set it can be concluded that it is possible predicting the LM intramuscular fat from adipocyte diameter. It would be of interest extend this investigation to meat quality evaluation as well as to the ewe fat metabolism during pregnancy and lactation.

Material and Methods

- Samples of intramuscular adipose tissue were obtained from the LM between the 1st and the 2nd lumbar vertebrae of 34 sheep carcass (19.3±3.3 kg).
- Intramuscular adipose tissues were fixed for 24 h in Bouin fluid, dehydrated and embedded in paraffin.
- Then, the samples were sectioned (5 µm thick), stained with hematoxylin and eosin and observed at 20X magnification in a microscope equipped with a camera (Nikon FXA) and digital images were obtained.
- The digital images were analysed with the ImageJ1.38X software converted into an 8-bit binary format and a threshold function was used and the intramuscular AD was measured (Figure 1).
- The LM intramuscular fat was determined by chemical analysis (Soxhlet method) using the LM from 13th thoracic to 4th lumbar vertebrae.
- Statistical analyses were performed using the JMP-SAS (Version 5.1). The data were analysed by regression analysis.

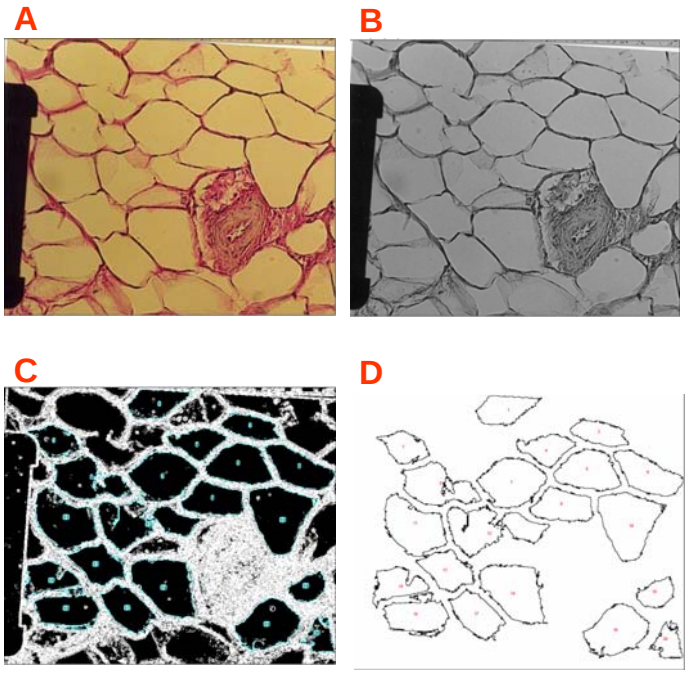

Figure 1 Steps for adipocyte image analysis. (A) (upper left): original captured image, (B) (upper right): 8-bit image transform, (C) (lower left): binary and threshold image, (D) (lower right): analyze particles image.