

Effects of body weight and rearing system on total lipids and cholesterol concentration of fresh *m. semimembranosus* and subcutaneous fat from Alentejano pigs

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Pork is the most widely produced and consumed meat (Mourot and Hermier, 2001). The European consumer, although suspicious of the subcutaneous or abdominal fat storage, prefers meat with a minimal proportion of intramuscular fat, which is at the origin of flavour (Fernández *et al.*, 1999). The Alentejano (AL) pig, an autochthonous breed from the south of Portugal with a high lipogenic activity even at the early stages of development (Neves *et al.*, 1996), has been used for decades to produce PGI and PDO dry cured hams, forelegs and sausages. This pig, traditionally fattened outdoors with grass and acorns, is today increasingly fattened with commercial diets and consumed as fresh meat.

Pork has been linked to cardiovascular diseases due to its high fat and cholesterol contents. Yet, about 70% of the fat from pigs is in a subcutaneous layer that can be removed before consumption (Bragagnolo and Rodríguez-Amaya, 2002). The literature values for the lipid and cholesterol content of pig's meat and fat varies widely, namely due to the body weight (BW) and breed of animals, diet, rearing system and method of analysis. Being two of several factors that influence human plasma cholesterol, an analysis of total lipids and cholesterol was carried out in the AL pigs' *m. semimembranosus* and lumbar subcutaneous fat, a breed where these parameters are not yet extensively studied.

Female and male AL pigs were weaned (60 d), castrated, allocated in individual pens (1 x 2 m) and fed a commercial diet (15% crude protein, 3100 kcal DE) offered at 85% of *ad libitum*. The pigs were slaughtered in groups (n=5) averaging 70.9 (W70), 80.2 (W80), 90.1 (W90), 100.5 (W100) and 110.2 kg BW (W110). Another three groups of pigs (n=5), submitted to the same dietary conditions, had access to an outdoor rearing area (3 ha) where small amounts of grass were available. These pigs were slaughtered at 90.4 (W90r), 100.2 (W100r) and 109.8 kg BW (W110r). The *m. semimembranosus* and lumbar subcutaneous fat total lipids were extracted by the Folch method (Folch *et al.*, 1957) and the total cholesterol concentration was determined with enzymic kits in isopropanolic extracts.

The AL pigs allocated in individual pens presented an increase with BW in total lipids of the *m. semimembranosus* (from 2.2 to 4.1 g/100g in W70 and W110, respectively) and of the subcutaneous fat (from 64.5 to 72.1 g/100g). The increase in total lipids was accompanied by an increase in the cholesterol content of the muscle (from 52.8 to 89.4 mg/100g in W70 and W110, respectively) and of the subcutaneous fat (from 155.3 to 303.0 mg/100g). As to the groups with access to the outdoor rearing area, they presented smaller and not significant increases in total lipids of the *m. semimembranosus* (from 2.8 to 3.4 g/100g in W90r and W110r, respectively) and of the subcutaneous fat (from 67.2 to 69.2 g/100g) and in the cholesterol content of the muscle (from 66.6 to 67.9 mg/100g in W90r and W110r, respectively) and of the subcutaneous fat (from 219.8 to 235.4 mg/100g). This suggests that total lipids and cholesterol deposition in this muscle and in the lumbar subcutaneous fat of AL breed are increased with BW (especially between 70 and 90 kg), but that the outdoor rearing system may moderate this deposition. In the sensitive balance between meat's technological and gustatory characteristics and the consumer's health, this last effect should be taken into consideration when choosing a rearing system for the AL pig.

References

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