CHEMICAL AND PHYSICAL CHARACTERISTICS OF FRESH SUBCUTANEOUS FAT FROM ALENTEJANO PIG BREED

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Background

The Alentejano pig differs from the modern highly selected breeds regarding growth rate and body composition. Comparatively with others, this pig shows a slow rate of growth and a high lipogenesis activity at the early stages of development. The lipids are deposited mainly in subcutaneous, renal and pelvic regions. The percentages of fatty cuts can attain more than 50% of the carcass weight and the backfat thickness at the last rib level can grow to 60 mm at 120 kg live weight (LW) (Almeida et al., 1993; Neves et al., 2001). This kind of carcass is considered ideal for the manufacture of dry cured products, and was for decades the main source of meat in the diet of the people living in Alentejo region. Nowadays, the production fulfills a double function: it provides meat for the manufacture of cured products and for fresh consumption. The manufacture industry (cured hams, forelegs and sausages) requires pigs reared in traditional extensive systems, slaughtered at 140-160 kg BW and with 18-24 months of age (De Pedro and Olmo, 2000). The emerging market of the fresh meat requires animals with 90-100 kg LW, obtained at 10-12 months of age. The adipose tissue plays an important role on the characteristics of cured or cooked products and fresh meat. The animal growth implies chemical, biochemical and physical changes in the adipose tissue, mainly due to an increase on the lipids content. These changes affect the gross chemical composition or the fatty acid composition, which could determine its global quality (firmness or softness, color or oxidation sensibility) (Lebret and Mourot, 1998).

Objectives

The aim of this work was to investigate the evolution of the chemical composition of fatty tissues and its effect on chemical and physical traits.

Materials and methods

Thirty Alentejano pigs were weaned at 28 days and castrated at 60 days old. After weaning, they were transferred to open-air individual pens with a protecting roof and fed a commercial diet (15 % CP; 3100 kcal DE) at 85 % of *ad libitum*. This diet had 3 % crude fat, distributed by the following major fatty acids: C16:0 (17,7 %), C18:1 (28,9 %) and C18:2 (31,2 %). The animals were weekly weighted and after a 24 h fasting period, 5 pigs were initially slaughtered at 40 kg LW. The remaining animals were fasted and slaughtered (5 animals) at 70, 80, 90, 100 and 110 kg LW. After slaughter, the left side of each carcass was submitted to a 24 h chilling, followed by commercial cuts and sample collection of backfat at last rib level. Adipose subcutaneous backfat at the 12^{th}-13^{th} rib level and ham were also sampled. All the samples were vacuum packaged and stored (-20 °C) until analysis. Analyses included moisture (Portuguese norm - 1614), total protein (Portuguese Norm - 1612) and lipids (calculated as 100 - [protein + water]). Color CIE L* a* b* (Minolta CR-200) and pH (Portuguese Norm - 3441) were also determined. Lipids for fatty acid determination were extracted at 50 °C, and prepared to obtain the methyl esters to be analyzed by GC/FID. An ANOVA was carried out and the means comparison was made by SNK test. The correlations between the variables studied were determined by the Pearson coefficient. SPSS statistical software was used.

Results and discussion

Table 1 presents the results of gross chemical composition and some physical traits. The slaughter weight affected significantly the gross chemical composition and the subcutaneous color values. As the slaughter weight increased, the water and protein amount decreased and the lipids concentration increased, mainly between 40 and 70 kg LW. From 70 kg to 110 kg LW, we observed the same significant differences between the two slaughter groups, but the differences among the tree major chemical compounds were less pronounced. The evolution of the gross chemical composition was paralleled by the increase of backfat depth and the increase of this adipose depot on the Alentejano pig carcass. This evolution of the chemical