

EVOLUTION OF THE COMPOSITION IN FATTY ACIDS OF THE DORSAL SUBCUTANEOUS ADIPOSE TISSUE FROM ALENTEJANO PIGS FED ON PASTURE AND ACORNS

J. Neves, A.B. Freitas, J.M. Martins, M.I. Ferraz de Oliveira, and M. Cancela d'Abreu

ICAM/Universidade de Évora, Apt. 94, 7002-554 Évora, Portugal

SUMMARY - The present work studied the evolution of fatty acid composition in the dorsal subcutaneous fat of free-range Alentejano pigs fed on pasture and acorns. Twenty pigs with a body weight (BW) of ~90 kg were placed in a 2 ha pasture (*Lolium westerwoldium* and *Trifolium incarnatum*) and fed daily with 4 kg of acorns. Animals were submitted to biopsies near tail insertion with ~90, ~100, and at slaughter, ~110 kg BW. The fat samples obtained were analysed by GC/FID to determine the fatty acid composition. An increase of only 20 kg body mass based on pasture and acorn consumption led to: (i) carcasses with C18:1 content similar to the minimal value stipulated by market demands for Alentejano pigs bred in free-range conditions; and (ii) contents of C16:0 and C18:0 were within the limits for the carcass-quality assessment. Nevertheless, the contents in C18:2 remained slightly above the 9.8% limit.

Key Words: Alentejano pig; acorn; grass; adipose tissue; fatty acids.

INTRODUCTION

The Alentejano (AL) pig is traditionally reared in extensive systems. During growth, pigs are fed fresh pasture in the spring, stubble in the summer, and by-products from different crops during these two seasons. From October to late February, AL pigs are fattened in "montanheira" with acorn (*Quercus* fruit) and grass. This fattening period lasts usually from about 70-90 to 140-160 kg body weight (BW) (Almeida *et al.*, 1993). The acorn is very palatable for the pig, which removes the hull to ingest only the kernel. Voluntary consumption of acorn has been estimated to vary from 6-7 kg in pigs of 50-70 kg to 8 kg in pigs of 80-90 kg BW. At 100 kg BW, this breed consumes about 9 kg of acorns (Laguna Sanz, 1998).

Acorn consumption favours fat deposition and reduces protein accretion (Aguilera and Nieto, 2003). Comparatively with other breeds, the AL pig shows a high lipogenic activity and lipids are deposited mainly in the subcutaneous backfat. The proportion of fatty cuts can attain more than 50% of the carcass weight and the backfat thickness at the last rib level can reach 60 mm at 120 kg BW (Almeida *et al.*, 1993; Neves *et al.*, 2001). This kind of carcass is considered ideal for the manufacture of dry cured products. In fact, 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 Sanz and Olmo, 2000). Pigs grown on acorn and grass consumption present chemical, biochemical, and physical changes in the adipose tissue, mainly due to an increase on the lipid content and on the deposition of oleic acid (C18:1), whose concentration on acorn is about 63% (Almeida *et al.*, 1993; Neves *et al.*, 1994). These changes may determine the adipose tissue global quality (firmness or softness, colour or oxidation sensibility) (Lebret and Mourot, 1998).

The C18:1 is the most abundant fatty acid in AL pig fat depots and has an important role in meat chemical and physical characteristics, mainly in adipose tissue. When pigs are fattened on acorns, the amount of C18:1 in their fat depots can reach ~60% (Almeida *et al.*, 1993; Neves *et al.*, 1994) depending on the total body mass gain while fed acorns. Due to this characteristic, the C18:1 proportion was converted in a reference for classification purposes of the source of raw matter from "montanheira" (minimum 54% of C18:1). The criteria also include the proportion of palmitic (C16:0) and stearic (C18:0) acids (minimum 21.3 and 9.8%, respectively), and the proportion of linoleic acid (C18:2) (minimum 9.8%), since an increase on C18:1 proportion could lead to a decrease of other fatty acids. According to Aguilera and Nieto (2003), to match these criteria AL pigs should have at least a total gain of 45 kg BW during the fattening period in "montanheira".