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Age at the beginning of the fattening period of Iberian pigs under free-range conditions affects growth, carcass characteristics and the fatty acid profile of lipids

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Abstract

This work studies the effect of starting age of the fattening period on productive traits and fatty acid (FA) composition of backfat (BF) of Iberian pigs. Three groups of eight Iberian barrows (body weight 101.25 ± 2.8 kg) started the fattening period at 14 (P14), 12 (P12) and 8 (P8) months of age. During the pre-fattening period pigs received 1.3, 1.5 and 2.5 kg/day of a commercial feed (for P14, P12 and P8, respectively). The P8 pigs showed lower slaughter weight, average daily gain (ADG), carcass weight, carcass outer length, backfat thickness and ham length than P14 and P12 pigs. In the subcutaneous outer backfat layer P14 pigs had significantly higher proportion of oleic acid (C18:1 n-9) ($P<0.05$) than P12 pigs. The subcutaneous inner backfat layer of P8 pigs had higher proportions of palmitic acid (C16:0), stearic acid (C18:0) and total saturated FA (SFA) and lower of C18:1 n-9, linoleic acid (C18:2 n-6), total monounsaturated FA (MUFA), total polyunsaturated FA (PUFA), total

Abbreviations: FA, fatty acid; P14, pigs starting fattening with 14 months of age; P12, pigs starting fattening with 12 months of age; P8, pigs starting fattening with 8 months of age; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids; NL, neutral lipids; PL, polar lipids; LD, *longissimus dorsi*; IMF, intramuscular fat; ADG, average daily gain; BF, backfat

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n-6 PUFA (n-6) and total n-3 PUFA (n-3) than P14 and P12 pigs. Finally, in the subinner backfat layer, P8 pigs had higher proportions of C16:0 and total SFA and lower of C18:2 n-6, C18:3 n-3, total PUFA, total n-6 and total n-3 than P14 and P12 pigs. In neutral lipids (NL) from intramuscular fat of *Longissimus dorsi* muscle, P8 pigs showed higher proportion of C16:0, C18:0 and total SFA and lower of C18:1 n-9, C18:2 n-6, total MUFA, PUFA and n-6 than P14 and P12 pigs. Polar lipids (PL) from P8 pigs showed higher proportions of C16:0, total SFA and lower C18:3 n-3 than those from P14 and P12 pigs. Hepatic NL of P8 pigs showed higher proportions of C18:0 and total SFA than P12 and P14 pigs. No differences on hardness, adhesiveness and chewiness of the inner subcutaneous backfat layer were observed among treatments. However, cohesiveness was lower in P8 than in P14 pigs and gumminess was lower in P8 than in P12 or P14 pigs. Therefore, productive traits, carcass quality and fat quality characteristics of Iberian pigs starting the fattening with 8 months are worse than those from pigs starting the fattening with 12 or 14 months of age.

Keywords: Performance; Iberian pig; Fatty acid profile; Fat rheological properties

1. Introduction

The traditional productive cycle for Iberian pigs includes a final free-range fattening phase (from November to February) in which natural feed resources, mainly acorns and grass, are consumed (Lopez-Bote, 1998). Free-range fattening has important consequences on the quality of the meat, both for fresh consumption and for elaboration of dry cured meat products (Lopez-Bote, 1998). In fact, products from free-range fattened Iberian pigs attain the highest prices in the market because of preference by consumers. The main reason for this preference is the high oleic acid content in the fat of these pigs, which is mostly due to the high oleic acid content of the acorns they consume (Ruiz et al., 1998). The high proportion of oleic acid in the carcass strongly influences the physical properties of fat (Ruiz et al., 2000; Ruiz and Lopez-Bote, 2002), leading to a soft and oily lard, which is highly appreciated by consumers of Iberian pig products (Ruiz et al., 2002). However, for most pork production systems such a feature is considered a drawback, since it impairs cutting, mixing and salt and water migration during processing (Ruiz and Lopez-Bote, 2002). Moreover, the higher oxidative stability of meat from free-range pigs, because of the high α-tocopherol content of grass and γ-tocopherol of acorns (Daza et al., 2005a), also improves technological and sensory quality of Iberian pig products.

To better adapt to free-range rearing, pigs should reach a minimum capacity of their locomotive and digestive systems. It is generally accepted that pigs should have at least 10 months of age prior to the start of the free-range fattening period (Lopez-Bote, 1998). As a consequence, pigs born from February to August are not adequate for free-range fattening, because acorns are available only from November to February. Therefore, these pigs are fed concentrates during the whole productive system, which leads to lower economical benefits. To make possible that pigs of different ages start the finish fattening period with similar weights, it is necessary to restrict feed intake in the older pigs, and to encourage feed intake in the younger pigs during the pre-fattening period. As a consequence, restricted pigs may show compensatory growth during fattening when they are fed *ad libitum*. Therefore, adequate management of reproduction and of natural feeding resources is important for