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Introduction and aim

The susceptibility of pig muscles to lipid oxidation depends on the balance between a number of factors, e.g.: fatty acid composition of cell membranes, balance between antioxidants and prooxidants, amount and composition of lipids, activity of certain enzymes (Lauridsen *et al*., 1999). A number of factors can also affect both, fatty acid composition of PLs and oxidative stability of pig meat, such as animal rearing system, diet composition and crossbreeding (Andres *et al*., 2001). The aim of this work was to asses the influence of diet and crossbreeding Iberian pigs with either Duroc-Jersey boars or gilts, on lipid composition and oxidative stability of fresh meat.

Materials and methods

Experimental design

3 crossbreeds: Iberian (♀) x Duroc; Iberian x Duroc (♀); Iberian.

3 diets: High Oleic Vit.E suppl.; control; free range (acorn).

Biological material: *Longissimus dorsi* (n=10 each group).

Lipid extraction: Bligh and Dyer (1959), Ruiz *et al.* (2004).

Methylation: Sadler and Karo (1992).

GC-FID: Muriel *et al*. (2002).

Induced lipid oxidation: Konbrust and Mavis (1980).

Results and discussion

Crossbreeding did not affect fatty acid composition of neutral lipids (NL) and polar lipids (PL) of intramuscular fat from Iberian pigs (Table 1), as can be observed comparing animals from groups fed HO-VitE diets (three first columns). Therefore, it seems that whether the boar is Iberian or Duroc-Jersey, does not influence fatty acid composition. As reported in previous studies, diet significantly affected fatty acid composition of both NL and PL. PUFA were significantly lower in NL and PL from free range animals. High oleic acid diets successfully increased the proportion of oleic acid and MUFA in PL, reaching levels as high as those from free-range animals. However, this effect was not evidenced in NL. Diets high in oleic acid and supplemented in vitE reduced muscle lipid oxidation (Fig. 1). Samples from free-range animals showed the lowest values after 200 min of incubation, probably due to the low levels of PUFA in PL and the presence of different tocopherol isomers.

Table 1. Fatty acid composition (in% of total FAMEs detected) of neutral and polar lipids from intramuscular fat of *longissimus dorsi* of different Iberian crossbreeds fed on different diets

	Ib(♀) x D (HO-VitE)	Ib (HO-VitE)	Ib x D (♀) (HO-VitE)	Ib(♀) x D (control)	Ib (free-range)	P
Neutral lipids						
C18:1 (n-9)	52.3 ± 0.95	51.2 ± 2.29	51.6 ± 1.86	52.0 ± 1.84	51.5 ± 1.59	0.669
∑AGS	37.2 ± 0.89	38.4 ± 3.00	38.6 ± 2.53	38.2 ± 2.63	38.7 ± 1.72	0.647
∑AGMI	57.7 ± 1.09	57.5 ± 2.60	57.2 ± 2.25	57.9 ± 2.15	57.4 ± 1.49	0.924
∑AGPI	4.9^{a} ± 0.75	4.1^{ab} ± 0.61	4.2^{ab} ± 0.89	3.9^{b} ± 0.70	3.9^{b} ± 0.45	0.018
Polar lipids						
C18:1	19.1^{a} ± 1.78	18.4^{a} ± 2.82	17.1^{a} ± 2.28	11.8^{b} ± 2.23	17.4^{a} ± 4.60	0.000
∑AGS	29.4^{b} ± 2.20	31.3^{b} ± 4.50	28.3^{b} ± 2.80	31.3^{b} ± 5.18	43.6^{a} ± 4.81	0.000
∑AGMI	21.5^{ab} ± 1.68	21.8^{a} ± 2.82	21.9^{a} ± 4.65	16.3^{b} ± 5.96	20.6^{ab} ± 4.64	0.015
∑AGPI	49.2^{a} ± 2.69	47.0^{a} ± 5.09	49.8^{a} ± 6.74	52.4^{a} ± 8.81	34.7^{b} ± 5.38	0.000

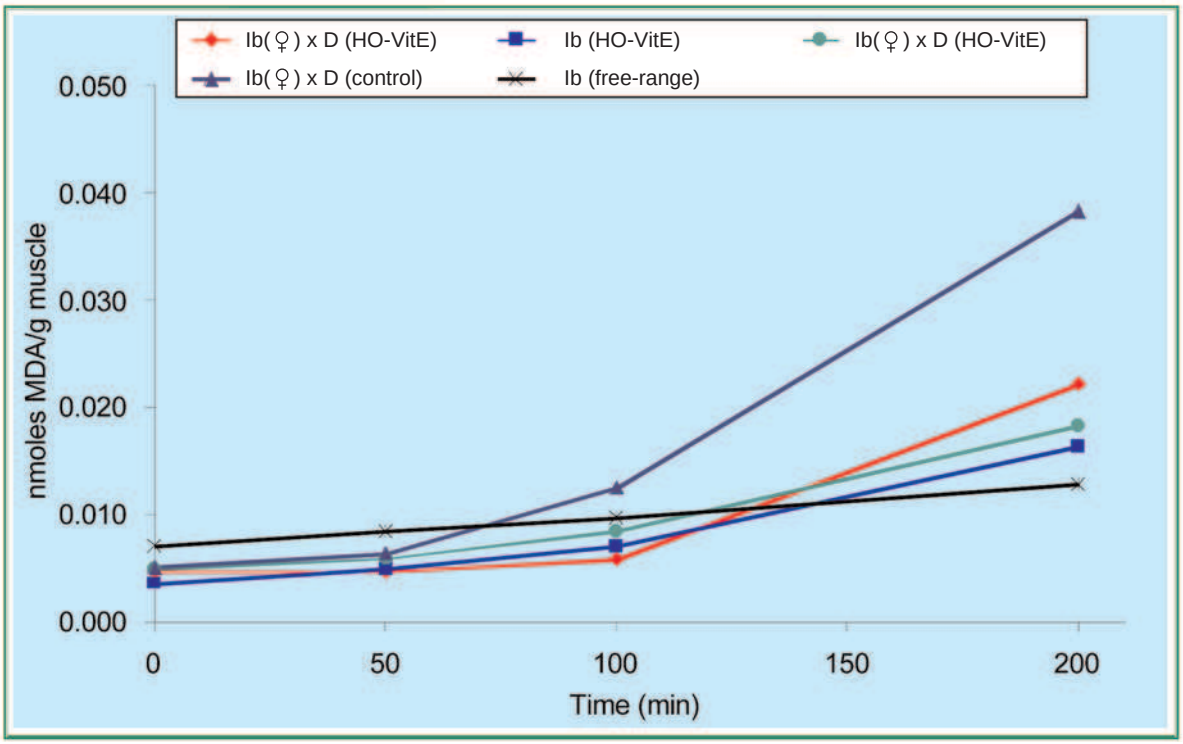

Fig. 1. Induced lipid oxidation of *longissimus dorsi* samples from different Iberian crossbreeds fed on different diets.

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