



Effect of dietary replacement of sunflower oil with linseed oil on intramuscular fatty acids of lamb meat

Eliana Jerónimo^{a,c}, Susana P. Alves^{a,b}, José A.M. Prates^c, José Santos-Silva^a, Rui J.B. Bessa^{a,c,*}

^aUnidade de Investigação em Produção Animal, INRB, Fonte Boa, 2005-048 Vale de Santarém, Portugal

^bREQUIMTE, ICBAS, Instituto de Ciências Biomédicas de Abel Salazar, Universidade do Porto, Campus Agrário de Vairão, 4485-661 Vairão VC, Portugal

^cCIISA, Centro de Investigação Interdisciplinar em Saúde Animal, Faculdade de Medicina Veterinária, Pólo Universitário do Alto da Ajuda, 1300-477 Lisboa, Portugal

ARTICLE INFO

Article history:

Received 9 January 2009

Received in revised form 26 May 2009

Accepted 22 June 2009

Keywords:

Conjugated linoleic acid

Lamb meat

Linseed oil

Meat

Polyunsaturated fatty acids

Sunflower oil

ABSTRACT

The effect of stepwise replacement of dietary sunflower oil (SO) with linseed oil (LO) on carcass composition, meat colour and fatty acid (FA) composition of intramuscular lipids of lamb meat was investigated. Thirty-six lambs were fed one of four diets consisting of pellets of lucerne with oil (60 g/kg): the diet varied in the composition of oil added and were: 100% SO; 66.6% SO plus 33.3% LO; 33.3% SO plus 66.6% LO and 100% LO. The experimental period was 7 weeks. Live slaughter weight, hot carcass weight and intramuscular fat percentage of chump and shoulder increased linearly with replacement of SO by LO.

Total FA content of *longissimus dorsi* muscle and polar and neutral lipids were not affected by the treatments. Replacement of SO with LO increased the content of 18:3 n – 3 and total n – 3 long chain ($\geq C_{20}$) PUFA (LC-PUFA) and decreased the 18:2 n – 6, total n – 6 LC-PUFA and 18:2 *cis*-9, *trans*-11 in meat lipids. Maximum CLA concentration (42.9 mg/100 g fresh muscle) was observed with 100% of SO, decreasing linearly by SO with LO replacement. Maximum n – 3 LC-PUFA was predicted to be 27 mg/100 g of fresh muscle at 78% of SO with LO replacement. Considering both CLA and n – 3 LC-PUFA, the maximum levels were estimated to be reached at 52% of replacement of SO with LO. The utilization of blends of SO and LO is a good approach for obtaining lamb meat enriched with both CLA and n – 3 LC-PUFA.

© 2009 Elsevier Ltd. All rights reserved.

* Corresponding author. Address: Faculdade de Medicina Veterinária, Universidade Técnica de Lisboa, Pólo Universitário do Alto da Ajuda, 1300-477 Lisboa, Portugal. Tel.: +351 213652871; fax: +351 213652889.

E-mail address: rjbbessa@fmv.utl.pt (R.J.B. Bessa).