Effect of the feeding system on intramuscular fatty acids and conjugated linoleic acid isomers of beef cattle, with emphasis on their nutritional value and discriminatory ability


*CEDA, Faculdade de Medicina Veterinária, Arroio da Universidade Técnica, Rua Universitário de Alto da Ajuda, 1300-477 Lisboa, Portugal
**RQEMT, Unidade de Produção Animal, ERNA, Instituto Nacional dos Recursos Biológicos, Fonte Real, 2025-944 Vale de Santarém, Portugal

ARTICLE INFO

Article history:
Received 26 July 2008
Received in revised form 3 September 2008
Accepted 21 October 2008

Keywords:
Meat quality
Feeding system
Finishing period
Fatty acids
CLA isomers

ABSTRACT

Thirty-two Alentejano purebred bulls were used to investigate the effect of four feeding systems (pasture only, pasture feeding followed by 2 or 4 months of finishing on concentrate, and concentrate only) on meat fatty acid composition (GC-FID), including conjugated linoleic acid (CLA) isomeric distribution (A(9)*-HPLC-DAD). In addition, meat fatty acids and CLA isomers were used to elucidate the impact of the different feeding regimens on the nutritional value of intramuscular fat and their usefulness as chemical discriminators of meat origin. The diet had a major impact on the fatty acid composition of beef (affected 27% of fatty acids and 10 of 14 CLA isomers), which was independent of the fatty acid concentration. Beef fat from pasture-fed animals had a higher nutritional quality relative to that from concentrate-fed bulls. Finally, meat fatty acid composition was an effective parameter to discriminate between ruminant feeding systems, including different finishing periods on concentrate.

© 2008 Elsevier Ltd. All rights reserved.

Abbreviations: NL, n-linoleic acid; CLA, conjugated linoleic acid; FAME, fatty acid methyl esters; MUFA, monounsaturated fatty acids; PDS, protected designation of origin; PUFAs, polyunsaturated fatty acids; SFA, saturated fatty acids; TFA, trans fatty acids.

* Corresponding author. Tel.: +351 213652890. Fax: +351 213652895.
Email address: japrates@mvv.ist.utl.pt (J.A.M. Prates).

0308-8146/ - see front matter © 2008 Elsevier Ltd. All rights reserved.
doi:10.1016/j.foodchem.2008.10.041