Irradiation effect on fatty acid composition and conjugated linoleic acid isomers in frozen lamb meat

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Abstract

The effect of gamma radiation processing on the lipid content, fatty acid composition and conjugated linoleic acid (CLA) profile in frozen lamb meat was investigated. Samples of longissimus thoracis muscle from lambs fed lucerne basal diets either un-supplemented or supplemented with polyunsaturated vegetable oils were irradiated (7 kGy) and analysed. CLA contents in lamb meat did not affect \((P > 0.05)\) the levels of lipid oxidation induced by the irradiation. No significant differences \((P > 0.05)\) were observed for fatty acid composition, related nutritional indexes \((n - 6/n - 3\) and PUFA/SFA), as well as for total lipid and CLA contents, between non-irradiated (control) and irradiated meat samples. In contrast, meat irradiation affected the relative proportions of total \(\text{trans,trans}^{-}\) and \(\text{cis,trans}^{-}\) CLA isomers \((P < 0.001)\), in addition to the percentage of some minor individual CLA isomers \((t11,t13\) and \(c11,c13\), with \(P < 0.05\) and \(P < 0.001\), respectively). The percentage of total \(\text{cis,trans}^{-}\) CLA isomers slightly decreased in irradiated samples, while the relative proportion of total \(\text{trans,trans}^{-}\) isomers slightly increased. This observation may be explained by the higher susceptibility to autoxidation of the \(\text{cis}\) double bond relative to the \(\text{trans}\) configuration.

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