Abstract

To investigate the feasibility of using the NIRS methodology to analyse the fatty acid content of rabbit meat and to discriminate between conventional and organic production, the meat of a hind leg of 119 rabbits was scanned between 1100 and 2498 nm and 104 samples were sent to the laboratory for reference analysis of fatty acids by gas chromatography. A commercial spectral analysis program (WINISI-2, v. 1.04) was used to process the data and to develop chemometric models. The better calibration equation for each fatty acid, leading to a higher determination coefficient of cross-validation (r^2) and low standard error of cross-validation (SECV) was retained. Prediction of linoleic, palmitic, palmitoleic and oleic acid content was excellent or good (r^2 between 0.90 and 0.70); prediction of arachidonic, stearic, α-linolenic and eicosatrienoic FA has r^2 between 0.69 and 0.50. However, miristic, vaccenic, icosaenoic and eicosadienoic FA are problematic to predict. When fatty acids were grouped, the r^2 of the calibration equations were: 0.85 for saturated FA, 0.83 for MUFA, 0.92 for PUFA and 0.91 for $n - 6$ FA, indicating excellent or good prediction. Prediction of α-linolenic FA ($r^2 = 0.59$) needs more precision. The obtained equations have been applied for predicting meat fatty acid composition of both groups of production systems, conventional and organic, for an other 52 rabbit meat samples (2×26). Meat of the organic source had lower ($p = 0.000$) monounsaturated FA (30.54% vs. 34.64%) and higher ($p = 0.019$) polyunsaturated FA (27.28% vs. 23.66%) than rabbit meat from the conventional system, while the saturated FA content was similar (42%) in both groups. The discriminant model correctly classified (98%) between conventional or organic produced rabbit meat.