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Determination of fatty acid groups in intramuscular fat of various local pig breeds by FT-NIRS

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The objective of the present study is to evaluate the potential use of FT-NIRS for predicting intramuscular fat (IMF) and fatty acid groups (MUFA; PUFA; PUFA n-3, PUFA n-6; SFA) on pig grounded muscles. The research considered 160 fresh samples of Longissimus collected from 12 European local pig breeds (TREASURE project). For every sample, lipids were extracted from IMF and fatty acid profile was determined by gas chromatography. Two aliquots of each sample were scanned using FT-NIRS Antaris II model. Mathematical pre-treatments (multiplicative scatter correction, 1st and 2nd derivative) were applied and outliers' spectra were identified and removed when necessary. Partial least square regression was used on the average spectrum and the models validated using an external data set. Results are evaluated in terms of coefficient of regression and root mean square errors in calibration (R^2 -RMSE) and validation (R_p^2 -RMSEP). As expected, the best results were obtained for IMF with R^2 higher than 0.99 and RMSE lower than 0.2. Unsaturated fatty acids, probably due to the absorption of the cis double bond in a specific region of near infrared spectra, obtain acceptable R^2 (0.89 for MUFA and 0.75 for PUFA n-3 and PUFA n-6). SFA achieved a R^2 of 0.81 that is lower than values reported in other studies probably because of the large variability of genotypes used. The validation models achieved both lower coefficients of determination and higher RMSEP than the calibration models; however, R^2 differences between calibration and validation were smaller than 5%, except for SFA. Hence, the FT-NIRS seems promising to estimate the principal parameters of fatty acid groups on muscle samples from different European autochthonous pig breeds. Inclusion of other samples can improve the accuracy and the robustness of the models, especially considering the high variability of the samples. Funded by European Union's H2020 program (grant agreement no. 634476).

Consumers' study on traditional pork products from local breeds: expectations and hedonic evaluation

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Assessing consumers' acceptability of traditional pork products (TPP) from local pig breeds is essential to ensure sustainability of regional pork chains. As part of TREASURE project, expectations and hedonic perception of Protected Designation of Origin (PDO) Noir de Bigorre (NB) dry-cured ham produced from pure Gascon breed were assessed. The study was conducted in Toulouse (France) as expanding market for TPP with 124 consumers, regular purchasers of TPP (quota sampling method). Three products were used, described as follows: 'NB-PDO dry-cured ham 24 months ripening – local pig breed in extensive system' (NB24), 'NB-PDO dry-cured ham 36 months ripening – local pig breed in extensive system' (NB36) as innovative TPP to enhance sensory quality, and 'Iberian ham – 50% Iberian pig' (IB) as competing product. Following the expectation disconfirmation theory, the sensory test included three phases: blind (tasting without information), expected (product description only: no tasting) and actual liking (tasting with information), assessed using a 9-point scale from 1: extremely dislike to 9: extremely like. Data were submitted to ANOVA (mixed model). Blind hedonic test showed no differences ($P > 0.05$) between products that all displayed high liking score (6.7 to 6.8). Product description strongly influenced expected liking ($P < 0.001$) with higher score for NB36 than NB24 (7.8 vs 7.2, $P < 0.05$) and lowest score for IB (5.2). Hedonic test with information showed higher actual liking for NB36 and NB24, that were similar, than for IB (7.4 and 7.2 vs 5.9, $P < 0.001$). Both NB hams displayed higher actual than blind liking ($P < 0.05$), denoting positive effect of information on acceptability. Actual liking was similar to expected for NB24, indicating fulfilment of hedonic expectations. By contrast, actual liking was lower than blind for IB ($P < 0.05$). Results will be completed with consumer preferences and willingness to pay for TPP and innovations in TPP. Funded by European Union's H2020 RIA program (grant agreement no. 634476).