

**Portable Raman spectrometer as a screening tool for characterization of Iberian
dry-cured ham**

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Acorn-fed or bellota dry-cured Iberian ham is a product derived from Iberian pigs fattened up by grazing acorns and pasture in a free-range or *montanera* regime. It is the most valued animal product from the dehesa agri-ecosystem. Its high commercial value, which reach very different prices depending on the commercial category, has led to an increase in labelling fraud, both in terms of the pig feeding regime and racial purity, causing great damage to the food sector. In this work, a method based on Raman spectroscopy was explored as a rapid in situ screening tool for Iberian ham samples. A total of 110 samples (48 samples of 100% Iberian acorn-fed, 32 samples of 50–75% Iberian acorn-fed and 30 samples of 50–75% Iberian feed-fed dry-cured hams) were analyzed to assess the potential of this technique to differentiate dry-cured Iberian ham four commercial categories: acorn-fed purebred Iberian, acorn-fed crossbred Iberian, free-range feed-fed crossbred Iberian and feed-fed crossbred Iberian. A continuous signal probably due to sample fluorescence was obtained, which hid the Raman scattering signal. Therefore, chemometric treatment was applied in order to extract non-apparent information. High validated classification rates were obtained for feeding regime (83.3%) and breed (86.7%). In addition, an interlaboratory study was carried out to confirm the applicability and robustness of the method, with 52 samples (22 samples of 100% Iberian acorn-fed, 8 samples of 75% Iberian feed-fed and 22 samples of 50% Iberian feed-fed dry-cured hams), obtaining a validated rate above 80%.

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