Title:

NIRS and artificial neuronal network to discriminate Iberian dry ham DO "Jamón de Guijuelo"

Authors & affiliations:

Hernández-Ramos, P.[1]; Martínez-Martín, I.[2]; Hernández-Jiménez, M.[2]; Vivar-Quintana, A.M.[2]; Revilla, I[2]; González-Martín, M.I.[3]

[1] Graphic Expression in Engineering, University of Salamanca

[2]Food Technology, University of Salamanca

[3] Analytical Chemistry, Nutrition and Bromatology, University of Salamanca

En los países mediterráneos el Iberiam ham es uno de los productos alimenticios más valorados por los consumidores. En España, el mayor productor de iberian ham, es la Protected Designations of Origin (PDO) "Guijuelo". El precio de estos productos hace necesario el desarrollo de una metodología confiable y rápida que permita la autentificación del jamón de cara a evitar el fraude. Near infrared spectroscopy (NIR) is one of the techniques which have the potential for such purposes and because of that, it has been widely used for the prediction of several composition parameters and for the quality control of pig meat. However, NIR spectral information demands multivariate data analysis due to its complexity. Artificial neural networks (ANN) is a chemometrical tool that are applied to distinguish objects or groups or populations. So, in this work spectral information coming from NIRS analysis was used to test the authenticity of the Iberian ham by means of ANN.

To do this, 91 ham samples, 25 samples from PDO Guijuelo Iberian hams and 66 samples from Iberian hams not belonging to PDO Guijuelo, were analysed using a NIRS (Foss) coupled with a fibre optic probe that were directly applied on the ham slice without any previous preparation. For classification purposes, ten different algorithms have been assayed with a number of neurons in the hidden layer between 1 and 50. Two groups of samples were analysed: the first one with the same number of samples (25), and the second one with different number of samples (25 vs 66) in the PDO and not PDO groups. The original data set was divided at random into a training set (70%),a verification set (15%, 12 observations), and a test set (15%) for all ANN tested. Los resultados obtenidos ponen de manifiesto que fue posible encontrar una arquitectura de la red que realicen una clasificación correcta del 100%. Además, la red funciona mejor cuando el número de muestras es equilibrado entre los grupos ensayados. En muchos casos mas de 1000 EPOC fueron necesarias. Continued epochs may well increase training accuracy, but increases the risk that the model was just memorising the training set. This resuls are very promising but it is necessary to increase the number of samples to improve the accuracy of the prediction

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