

Quality and Safety controls in complex blends of food ingredients

J.R. Quevedo¹, E. Montañés¹, B. Carrasco², A. Soldado³, B. de la Roza-Delgado³

¹Artificial Intelligent Centre of the Oviedo University Gijón Spain

²PREMIUM INGREDIENTS, S.L., San Ginés, Murcia (Spain)

³Regional Institute for Research and Agro-Food Development (SERIDA), Villaviciosa Spain

Nowadays, high-quality ingredients included in complex blends, enhance the properties, performance and quality of many food products. These ingredients provide indispensable functions to the processing industry, e.g. act as emulsion and color stabilizers, maturing agents, texture and taste improvers, freshness retainer, etc. These ingredients are in accordance with the legal requirements for safety and quality related with food labeling and new regulations. NIRS has been proposed as an alternative technology to ensure correct labelling, and assess quality and safety. This knowledge could be applied to food industry in order to establish strategies based in NIRS and focused on quality control, avoiding contaminants and frauds. For this reason the objective of this work is to develop a chemometric strategy to implement NIR methodology based on support vector machines technique as routine method in safety and quality control laboratory.

A library built with 17586 spectra recorded in a Perkin Elmer Spectrum One (1100-2500nm, each 4nm) device, and 5565 spectra recorded in a DS FOSS (400-2500nm, each 0.5nm) system coming from 454 formulations and 149 ingredients was used for the development of this research work. It was deleted formulations considered not representative of the global population. Further work was developed with 19968 spectra coming from 148 formulations.

After extracting 10% of spectra included in each formula, we proceed to validate externally the developed model. Results show an accuracy of 76.6% and a precision of 95.6%, when selecting 10% of spectra included as validation population.

This research has been supported by Spanish Ministerio de Economía y Competitividad (grant TIN2011-23558)