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Identifying and quantifying adulterants in extra virgin olive oil of the picual varietal by absorption spectroscopy and non-linear modeling

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In this research, the detection and quantification of adulterants in one of the most common variety of EVOO has been successfully carried out. Visible absorption information was collected from binary mixtures of Picual EVOO with one of four adulterants; refined olive oil, orujo olive oil, sunflower oil, and corn oil. The data gathered from the absorption spectra was used as input to create an artificial neural network (ANN). ANNs are mathematical models with the outstanding ability to find non-linear relations between different variables in databases. The designed mathematical tool was able to detect the type of adulterant with an identification rate of 96%, and to quantify the volume percentage of EVOO in the samples with a low mean prediction error of 1.2%. These significant results make ANNs coupled with visible spectroscopy a reliable, inexpensive, user-friendly, and real-time method for difficult tasks, given that the matrices of the different adulterated oils are practically alike.

Biography

Regina Aroca Santos is currently working on her PhD at the Complutense University of Madrid with Professor Jose Santiago Torrecilla, and she is also collaborating with the research group AlgoReach.

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