

5th Euro-Global Summit and Expo on

Food & Beverages

June 16-18, 2015 Alicante, Spain

Application of neural networks to monitor extra virgin olive oil degradation

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Extra virgin olive oil (EVOO) is the only fat which comes from the juice of fruits, more specifically, from the olive. For this reason, olive oil is one of the healthiest kinds of oils. As a general concept, the degradation of olive oil negatively affects the beneficial characteristics it provides. EVOO normally degrades because of the oxidation of the chlorophyll it contains. Chlorophyll suffers from degradation due to different causes such as light, time, and/or temperature. These phenomena oxidize chlorophyll, which loses its containing magnesium atom, originating the loss of green intensity of the olive oil. This physicochemical process can be characterized through UV-Visible spectroscopy, as changes appear reflected in the absorption spectra as the oil is degraded. In this study, a series of EVOO samples, from both pure varietals and binary mixtures, have been monitored through absorption studies during 45 days to evaluate the effect of time and light on the samples. The data obtained was used to estimate the degradation time that the EVOO samples have undergone using a mathematical model based on artificial neural networks, which provided a mean absolute error of less than 5.5%. These algorithms have enabled the design of a tool that can be employed to evaluate the quality of an EVOO, and to determine how it has been treated since its departure from the olive mill.

Biography

Jose S Torrecilla is a Professor of the Chemical Engineering Department of the Complutense University of Madrid (UCM). He received his PhD in Chemical Engineering from UCM in 2000. From all of his main lines of research, it is worth highlighting the modeling of complex systems and the design of chemo metric tools used in many fields such as health, chemistry, engineering, and food technology. He has collaborated with numerous universities as well as national and international research facilities. The impact of his research can be measured with the great number of published articles in various prestigious international journals, some books related with his research lines, and a few national and European patents. His importance can also be evaluated through the participation and coordination of a great number of competitive projects inside the American, European, and national frameworks. During the last few years he has given lectures and seminars at distinguished international research centers, being the main coordinator of some them.

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