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# APPLICATION OF ARTIFICIAL NEURAL NETWORK FOR THE PREDICTION OF OLIVE HARVESTING TIME

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Extra virgin and virgin olive oils are 'fruit juice' oils and they have good sensory and nutritional properties. Quality of raw material and quality assurance throughout the processing are very important. Quality parameters are influenced by harvesting time and malaxation temperature. This study reports the application of artificial neural network(ANN) to the aroma profile results obtained by using surface acoustic wave(SAW) sensing electronic nose and malaxation temperature of olives(input) for the prediction of harvesting time of olives(output). Input parameters had 20 peaks. The multi-layer feedforward(MLF) neural network model was constructed with 19 inputs corresponding to the electronic nose measurements obtained by analyzing aroma profiles of olive oil samples and 1 input malaxation temperature of olive oils. Three different malaxation times were used and these were 27°C, 37°C, and 47°C. Harvesting time included three classes which were early, middle, and late harvest times. A total of 71 data sets consisting of the aroma profile results of olive oil samples were used for this study. Fifty nine data sets were used for training and 12 data sets were used for testing the ANN model to predict harvest time of olive from the electronic nose measurements and malaxation temperature of the oil samples. Consequently, ANN model had a good prediction with low error measures. It has provided satisfactory results with a high determination coefficient ($R^2$ = 0.9724) showing that the electronic nose, in combination with artificial neural networks, could represent a fast and functional method for the determination of harvesting time of olive.

Keywords: Olive oil, artificial neural network, harvest time, malaxation temperature

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