TIME DOMAIN REFLECTOMETRY AS A PROMISING ANALYTICAL APPROACH FOR THE DETERMINATION OF FATTY ACID ETHYL ESTERS IN EXTRA VIRGIN OLIVE OILS

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Fatty acid ethyl esters (FAEEs) are important quality and genuineness parameters for extra virgin olive oils (EVOOs), since they are considered *i)* direct markers strongly related to the quality of the olives and *ii)* possible indirect markers of an illegal soft-deodorization treatment. The EU Reg. 2095/2016 fixes the actual limit for FAEEs at 35 mg/kg for the commercial category of EVOO; the official EU analytical method for their determination in olive oil is particularly time consuming, so robust, rapid, and environmental friendly approaches for a preliminary screening of samples could be highly desirable. In this context, a set of extra virgin, virgin and lampante olive oils was considered. Firstly the content in FAEEs has been determined by following the EU official method. In parallel, all the samples were also analyzed by Time Domain Reflectometry (TDR) and waveforms were elaborated by Partial Least Squares multivariate regression (PLS). Test set validations procedures were considered. The aim was to build up-loadable models for the prediction of FAEEs, employing the data coming from conventional techniques for the calibration. Discriminant multivariate data analysis was also explored to classify samples. This approach is devoted to develop a prototype for validating the screening procedure. This work was developed in the context of the project OLEUM "Advanced solutions for assuring authenticity and quality of olive oil at global scale" funded by the European Commission within the Horizon 2020 Programme (2014–2020, grant agreement no. 635690