contained into packaging materials can be released, either into food or headspace, in a controlled manner initiated by a trigger (pH, NH3) developed in early stages of food spoilage aiming to prolong the self-life.The aim of this study is to produce a food quality evaluation system that can be linked with a physico – chemical trigger. The trigger can be linked to microbial, chemical, and organoleptic properties alteration of some studied foods. FTIR spectroscopy and gas chromatography will be used as laboratory methods for identification of food spoilage products.The method represents a new opportunity for food industry producers regarding the extended shelf life foods, reducing food alteration and food waste.

Keywords: food waste, extended validity, sensors, safety food.

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SF2021-89757 - Can NIR spectroscopy foster olive oil chain sustainability? - Oral Presentation

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Thinking of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”, it is clear that green chemistry can play a pivotal role for sustainability of agri-food chains, by providing on-line techniques for automatic evaluation of food quality and optimization of food processes, while minimizing the use of hazardous materials, decreasing energy and water usage, and maximizing efficiency (Kirchhoff, 2005).This presentation aims at demonstrating the usefulness of NIR spectroscopy (NIRS) as a green chemistry tool in fostering olive oil chain sustainability. In particular, key applications of NIRS for olive ripening evaluation, extra virgin olive oil (EVOO) process guidance and authenticity assessment are presented.An objective and automatable method for olive maturity evaluation and the prediction of moisture, oil content, soluble solids, total phenolic content, and antioxidant activity of intact olives based on NIRS is proposed. Thirteen cultivars were harvested at different ripening stages along three years and analysed for maturity index and composition. Partial Least Squares-Discriminant Analysis (PLS-DA) classification models for olive ripening degree prediction were developed using FT-NIR spectra collected in diffuse reflectance (12,500-3,600 cm-1; 8 cm-1 resolution; 32 scans), reaching sensitivity and specificity of 79% and 75%, respectively. The same spectra were used to develop PLS regression models for prediction of chemical characteristics, obtaining R2pred ranging from 0.68 to 0.77, and low RMSEP values.As for EVOO authentication, FT-NIR spectra of 197 olive oil samples were collected (12,500-4,000 cm-1; 8 cm-1 resolution; 16 scans) and used for calculation of PLS regression models, considering the whole fatty acid ethyl esters content range (0.92-111.63 mg/kg) or a reduced range (0.92-50 mg/kg). The best models were obtained with the reduced range, reaching a R2pred of 0.85 and a RMSEP of 4.63 mg/kg.Acknowledgements: This work has been supported by AGER 2 Project (Grant n° 2016-0105).

Keywords: NIR spectroscopy; non-destructive method; olive oil; sustainability.

Kirchhoff, M.M., 2005. Promoting sustainability through green chemistry. Resources, Conservation and Recycling, 44, 237–243. doi:10.1016/j.resconrec.2005.01.003