**Optimization and development of NIRS prediction models for their implementation in food process control.**

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Due to the complexity involved in obtaining robust NIR agri-food applications, it is crucial to reinforce the links between the academia and instruments and software developers., in order to exchange knowledge and practice about the opportunities offered by the different instruments and accessories available in the market for each food and feed application as well as optimize sample analysis and data treatment adapting them to the requirements of a given food/feed industry. For this purpose, a SensorFINT Short-Term Scientific Mission (STSM) was carried out from July 26th, 2021, to August 6th, 2021, by the first author and under the supervision of Dr. Andreas Niemöller.

First, the equipment assembly plant of Bruker Optik GmbH was visited to obtain knowledge about the design and technologies in which the instruments offered by Bruker are based. Then, a training was completed on the OPUS and CMET software for the development and optimization of quantitative models for the prediction of parameters related to food quality, with special emphasis on the real implementation of these models. Finally, thirty-one different types of vegan spreads were analysed in the MPAII and Tango instruments which are based on FT-NIR technology. All samples were analysed both in glass and polystyrene petri dishes (GLPD and PSPD respectively), in all cases in duplicate. Prediction models of Fat (%) and Protein (%) parameters were developed, for which the commercial reference values were used. Four Hummus samples ,from the total of 31 vegan spread samples available were used to make the validation set. The results obtained showed that this type of samples can be analysed using both GLPD and PSPD dishes, obtaining prediction models of high quality.

**Keywords:** food process control, FT-NIR analysis, vegan spreads, sample presentation

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