Suitability of a portable Near Infrared Spectroscopy sensor for its applicability to the on-site analysis of Extra Virgin Olive Oil

Mar Garrido-Cuevas1\*, Ana Garrido-Varo1 and Dolores Pérez-Marín1

1 Faculty of Agriculture & Forestry Engineering, Department of Animal Production, University of Cordoba, Campus Rabanales, Ctra. Nacional IV-Km 396, 14071 Cordoba, Spain.
\*margarridocuevas@hotmail.com

Trends in the use of Near Infrared Spectroscopy sensors (NIRS) in the agri-food industry are moving towards the use of small size and low-cost spectrometers, suitable for on-site use. However, most of the existing commercial portable NIRS spectrometers were designed for process control within the pharmaceutical and chemical industries, and not for food applications. Therefore, before providing potential users with information on the suitability of a commercial portable NIRS sensor for a given food/ feed product, it is important to evaluate a number of key influencing factors (spectral signal repeatability, ease of cleaning, ease of on-site use). The aim of the present work is to provide scientific evidence on a commercial portable NIR sensor that provides absorbance readings between 908 and 1676 nm (every 6.2 nm) and is based on Linear Variable Filter (LVF) technology, for its suitability for on-site analysis of Extra Virgin Olive Oil (EVOO). A first step in the evaluation has been to compare three different liquid accessories possible for use with this instrument, which use different optical modes (transmission or transflectance) and different sample presentation modes. The task involves the evaluation of the spectral repeatability, sample preparation time, ease of cleaning and ease of use for on-site analysis of EVOO. Preliminary results show that collecting spectra in transflectance mode has some advantages over the transmission mode, such as ease of sample preparation or cleaning of the cup. However, the accessory for liquid analysis using the folded transmission mode offers a higher spectral repeatability, which is essential to obtain quality spectral data.

**Keywords:** Near infrared spectroscopy (NIRS), portable instruments, on-site analysis, extra virgin olive oil, liquid accessories.

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