Optimization of the spectral acquisition process of watermelons using new generation portable and online instruments and study of the quality of the spectral data

M. Vega-Castellote1, M.T. Sánchez1,\*, I. Torres-Rodríguez2, M.J. De la Haba1, A. Garrido-Varo2, D. Pérez-Marín2,\*.

1 Department of Bromatology and Food Technology, University of Cordoba, Córdoba, Spain

2 Department of Animal Production, University of Cordoba, Córdoba, Spain

\*Corresponding authors. Email: teresa.sanchez@uco.es (M.T. Sánchez) or dcperez@uco.es (D. Pérez-Marín).

The acquisition of high quality spectra and the optimization of the spectra taking process are crucial for the success of the non-destructive quality characterization of horticultural products by near infrared spectroscopy (NIRS), during their growing period in the field and in the industrial processing lines. The aim of this research was to assess various alternatives related to the mode of analysis and the configuration of two new generation NIRS instruments, which were suitable for the *in situ* and online analysis of the watermelons respectively, in order to optimise the quality of the NIRS fingerprint of fruits acquired. Once the alternatives were evaluated, the most suitable option was identified for each instrument. In addition, given the importance of obtaining representative spectral libraries of the watermelons analysed in order to develop robust quality prediction equations, the RMS statistic was calculated, and the spectral repeatability results were evaluated for the all the fruits analysed in the assays.

**Keywords:** watermelon, optimization, spectral repeatability, portable device, online NIRS instrument,