Abstract

The aim of the present study was to investigate the effect of pear fruit biological variability on robustness of FT-NIR models for sugar content of pears. The robustness of the calibration models for sugar content with respect to the three factors (orchard, season and cultivar) was tested based on FT-NIR spectroscopy and a statistical analysis was performed on a large spectral data set to analyze the effect of this three factors. Season and cultivar were responsible for a major amount of the spectral variability, whereas the influence of the orchard was low and only appeared for certain cultivars during specific seasons. It was found that the accuracy of the models increased considerably when including more variability in the calibration set. On the other hand, adding more data to the calibration set increased the chance of adding atypical data, which resulted in reduced model accuracy. Therefore, it is important to construct the calibration data set in such a way that it is representative for future measurements.