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Development of a non-destructive quality evaluation method for tea using Vis-NIR spectroscopy

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The potential of the use of visible-near infrared (Vis-NIR) spectroscopy for rapid determination of total polyphenol (TPP) content in different teas was investigated as an alternative to the time consuming colorimetric wet chemical analysis methods currently used. Vis-NIR spectra of the tea samples were collected using tea powder. Reference values for the TPP content in the tea samples were determined colorimetrically using a ferrous tartrate reagent. A partial least-squares regression analysis was used to perform the calibration and validation. The best model had the highest correlation coefficient (R) value, as well as the highest ratio of performance deviation (RPD) value in the validation set. This model also had the lowest root mean square error of cross-validation value (RMSECV) and a low bias value in the validation set. This method could therefore be successfully applied to the rapid and accurate quantification of TPP content in teas, and to screen a large number of samples within a short time.