

Title Prediction of blueberry (*Vaccinium corymbosum*) ripeness by a portable Vis-NIR device
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Keyword blueberries; *Vaccinium corymbosum*; Vis-NIR; quality; non-destructive; ripeness

Abstract

Consumers are becoming more aware of food aspects related to health and their impact on quality of life. For these reasons the modern concept of quality combines ripening parameters and nutritional content. Many of these characteristics are based on preharvest factors and correct harvest maturity. Traditionally, blueberry quality evaluation is achieved by a simple sensory test and evaluation of some indexes like soluble solids content (SSC) and acidity. These parameters are not sufficient as quality indicators and food functionality indexes need to be investigated. The conventional methods for the determination of these quality parameters are time consuming, require preparation of samples and are expensive. Visible-Near Infrared Spectroscopy (Vis-NIR) is a rapid and non-destructive technique, requiring minimal sample processing before analysis and, coupled with chemometrics, appears to be one of the most convenient and straightforward analytical tools to study fruit quality and ripeness. With this aim, an optical, portable, experimental device (Vis-NIR spectrophotometer) for non-destructive and quick prediction of ripening indexes (soluble solids content and firmness) and presence of compounds with functional properties (total anthocyanins, total flavonoids, total polyphenols and ascorbic acid) of fresh berries and homogenized samples of blueberries ('Brigitta Blue' and 'Duke') using wavelengths ranging from 450-980 nm was built and tested. Good predictive statistics were obtained with correlation coefficients (r) between 0.80 and 0.92 for the regression models built for fresh berries. Similar results were obtained for the regression models for homogenized samples with $r > 0.8$ for all the indexes. Results show that Vis-NIR spectroscopy is an interesting and rapid tool for assessing blueberry ripeness.