Title Theory and application of near infrared spectroscopy in assessment of citrus quality: a review

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Abstract

China is one of major countries growing great mount of citrus for commercial production. Still little portion of the product is processes into the value-added citrus product, due to not enough deep-processing technology, constraining further development of the industry. The idea of measuring citrus fruit quality according to physical properties and chemical compositions, then grading them into groups, may help to meet the requirements of markets, and result in the growth of related industry. Near infrared spectroscopy (NIR) is readily employed in fruit quality assessment due to its rapidness and non-destruction and some other advantages comparing with other physical and chemical methods. Commonly, the soluble solid content, sugar content, carotenoid content, organic acid, oils and other substances in the citrus fruit, as well as firmness of the fruit, would strongly affect its fresh-eaten taste and processed-product quality. Literatures show NIR's feasibility in citrus quality measuring mentioned above. Furthermore, proper chemonetrics methods will improve the model performance. This article introduces the theory of NIR and effectiveness for citrus physical and chemical assessment, and analyzes various testing patterns like reflectance, transmittance, etc. Potentiality of no-line utilization is discussed in this article, because NIR is not wealth of publicizing until being used on-line. Besides applications mentioned in the literature, authors also point out other possible use of NIR in citrus process industry.