Quality Control of Mango Fruit during Postharvest by Near Infrared Spectroscopy

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ABSTRACT

Near infrared spectroscopy (NIRS) is a prominent technique for non-destructive fruit quality assessment. This research applied NIRS to control mango quality during postharvest management, harvesting, cold storage and shelf storage. Mango fruits cv. Nam Dok Mai Si Thong were harvested in three stages of fruit maturity; 100, 110 and 120 days after fruit set (DAFS). Mangoes were then divided into three groups. The first group was used to measure the quality at harvest. Mango fruits were measured using short wavelength spectra (700-1100 nm) by NIRsystem 6500 with a fiber optic probe. Physical (color and firmness) and chemical properties (total soluble solids (TSS), tiratable acidity (TA) and dry matter (DM)) were analyzed by conventional methods. The partial least square regression (PLSR) was used to develop the calibration model using The Unscrambler® version 9.8 (CAMO, Oslo, Norway). The means of the data were compared using the least significant difference (LSD). The second group was used to measure quality after cold storage, and was comprised of mango fruits at two harvesting stages (100 and 110 DAFS). Fruits from each stage were stored in cold conditions (13°C, 80-90%RH) for 21 days before the spectra were measured using the NIRsystem 6500. The physical and chemical properties were analyzed. PLSR model development and study of variance followed the same procedure as with the first group. For the third group, mango fruits at two harvesting stages, 100 and 110 DAFS, were stored in cold conditions (13°C, 80-90%RH) for 21 days, after which all samples were kept in the same chamber at 22°C for an additional 4 and 7 days. Spectral data measuring, physical and chemical properties, the PLSR model development and analysis of