

Thapanee Sathorn 2010: Quality Evaluation of Chili Sauce by Near Infrared Spectroscopy (NIRS).  
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Development, Department of Product Development. Thesis Advisor:  
Associate Professor Thongchai Suwonsichon, Ph.D. 163 pages.

Chili sauces are an important exported product of Thailand. Development of rapid quality measurement for chili sauce could be useful for improving product qualities. This study was aimed to apply near infrared spectroscopy (NIRS) as a rapid analysis method for evaluation chemical physical and heat qualities in chili sauce. Totally 180 chili sauces were scanned by near infrared (NIR) spectrometer in the region of 1100-2500 nm and were also analyzed to quantify the reducing sugar (RS), total sugar (TS), total soluble solids (TSS), total acidity (TA), pH, L\*, a\*, b\*, C\* and h. Both spectra data pretreated by Savitzky-Golay smoothing and analyte data were used to develop optimum calibration models by the partial least squares regression (PLSR), the moving window partial least squares regression (MWPLSR) and the searching combination moving window partial least squares regression (SCMWPLS). Results showed that the SCMWPLSR models were suitable models for predicting RS, TS and TSS with the correlation coefficient (R) values of 0.958, 0.982 and 0.998, respectively. For the MWPLSR models were suitable models for predicting TA, pH, L\*, a\*, b\*, C\* and h with the R values of 0.927, 0.747, 0.816, 0.773, 0.827, 0.811 and 0.697, respectively. For studying NIRS to predict capsaicin and scoville heat units (SHU) in chili sauces, 100 samples were analyzed and were scanned by NIR as mentioned above. Results showed that the MWPLSR models were also suitable models for predicting capsaicin and SHU with the R of 0.943 and 0.915, respectively. While NIRS for quantify heat sensation in chili sauces, 40 samples were evaluated by ten trained panelists and were scanned by NIR as mentioned above. Results showed that the back propagation artificial neural networks (BP-ANN) were suitable models for predicting overall heat intensity, tongue burn, oral cavity burn and throat burn with the R values of 0.947, 0.946, 0.920 and 0.930, respectively. This study showed that NIRS could be used for predicting chemical, physical and heat qualities in chili sauce.

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Student's signature

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Thesis Advisor's signature