

論文名 : Non Invasive Determination of Internal Quality of Purple Passion Fruit by Near Infrared Spectroscopy (要約)

新潟大学大学院自然科学研究科

氏名 Phonkrit MANIWARA

---

(以下要約を記入する)

This study aimed to investigate the feasibility of visible and short-wave near infrared spectroscopy (Vis/SWNIRS) for evaluating passion fruit quality. Two measurement techniques; interactance and transmission were compared their performing abilities. Multivariate of partial least square regression was used to construct prediction models for physical and chemical quality of intact passion fruit. The following conclusion can be drawn from all experimental results. Vis/SWNIRS was found to be feasible to predict chemical quality of passion fruit, namely, soluble solids content, titratable acidity, ethanol concentration, as well as physical quality like peel firmness and pulp percentage. Interactance measurement was found to be more superior than the transmission since it could estimate titratable acidity and provided a better prediction accuracy in soluble solids content. Nonetheless, neither modes of measurement was able to predict ascorbic acid in passion pulp since the fruit morphological difficulties itself (thick peel, uneven pulp, present of seeds and internal cavity), and highly concentrated of other acids that obstructed Vis/SWNIR spectroscopic power.

Furthermore this study reported also on calibration modeling and performance of visible and short-wave near infrared spectroscopy (Vis/SWNIRS) in estimating passion fruit postharvest quality. Original spectral data were used to develop partial least square (PLS) regression model, aiming to predict edible portion, total soluble solids and titratable acidity of passion fruit. PLSR performed well to capture most important information for predicting future samples even though some outlying spectra were observed. Optimum amounts of factors were identified by the potential residual analysis during cross validation. Percent variation and cumulative percent variation effectively informed how factors employed the PLS models. All developed PLS calibration models highlighted visible light and SWNIR range between 960-999 nm. The PLS models of edible portion and total soluble solids were proofed their robustness while a model for predicting titratable acidity failed to reach acceptable prediction accuracy.