

Chumnian Nilpuang 2008: Quality Determination of Single Kernel of Thai Milled Rice by Near Infrared Spectroscopy. Master of Engineering (Food Engineering), Major Field: Food Engineering, Department of Food Engineering. Thesis Advisor: Mr. Ronnarit Rittiron, Ph.D. 103 pages.

The objective of this research was to develop a system for quality determination of single kernel of Thai milled rice by Near Infrared Spectroscopy (NIRS). The important qualities considered were protein and amylose contents. Four cultivars of Khoadawkmalai 105, RD 23, Phathumthani 1 and Chainat 1 were used as samples. A kernel of rice was placed in a specially designed sample cell and a spectrum of single kernel was acquired in wavelength region of 1100 nm to 2500 nm in reflectance mode. Then, protein and amylose contents of each kernel were measured by Dumas combustion and iodine titration methods, respectively. Partial least square regression (PLSR) was used to develop a calibration equation. From the results, it was found that the developed sample cell could be used for spectral acquisition of single kernel of Thai milled rice. Using the system proposed, sufficiently accurate protein calibration equation with correlation coefficient (R) of 0.91 and standard error of prediction (SEP) of 0.91% could be obtained. For amylose calibration equation, it was approximate calibration usable for screening with R and SEP of 0.84 and 4.33%. Both equations showed no significant differences between actual values and NIR predicted values by paired t-test at 95% confidence.

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Thesis Advisor's signature

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