

## **Non-Destructive Prediction System Using near Infrared Spectroscopy for Crude Palm Oil**

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**Abstract :** Near infrared (NIR) spectroscopy has always been of great interest in the food and agriculture industries. The development of predictive models has facilitated the estimation process in recent years. In this research, 176 crude palm oil (CPO) samples acquired from Felda Johor Bulker Sdn Bhd were studied. A FOSS NIRSystem was used to take absorbance measurements from the sample. The wavelength range for the spectral measurement is taken at 1600nm to 1900nm. Partial Least Square Regression (PLSR) prediction model with 50 optimal number of principal components was implemented to study the relationship between the measured Free Fatty Acid (FFA) values and the measured spectral absorption. PLSR showed predictive ability of FFA values with correlative coefficient (R) of 0.9808 for the training set and 0.9684 for the testing set.

**Keywords :** palm oil, fatty acid, NIRS, PLSR

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