Analysis of Cassava using the DA 7250 Analyzer

Introduction

Analysis of moisture, starch and fiber in cassava is of high importance in cassava processing. When fermenting cassava into ethanol, starch levels determine the ethanol yield, and to be able to quickly determine the starch content of incoming cassava is critical.

The Near Infrared Reflectance (NIR) technology is highly suitable for this purpose. NIR is an indirect analytical method, were the relationship between reference values and the spectra of the samples are related using multivariate calibrations. Instead of the time consuming and labor intensive traditional wet chemistry methods, with NIR the multi component analysis is done in seconds. The latest technology and software developments allows the benefits to be even further exploited with easy to use instruments and web based instrument networking.

DA 7250 NIR Analyzer

The DA 7250 is a Near Infrared Reflectance (NIR) instrument designed for optimal use on agricultural products. Using novel Diode Array technology, the DA 7250 is unique in its measurement speed, versatility and accuracy.

The instrument is handled by an intuitive touch screen interface and in less than 10 seconds samples are measured in flexible open dishes. Most sample types can be measured as they are without any preparation or as an alternative be grinded and measured as powder or coarse meal.

Method

More than 200 cassava samples collected by the KAPI university in Thailand served as the calibration set. The samples were analyzed on DA 7250 using open faced plastic sampling dishes.

Calibration models were developed to model the relationships between the DA 7250 instruments NIR spectra and the reference chemistry result for moisture, starch and fiber. Model development were done using scatter correcting spectra pre-treatments and multivariate regression.

Results and Discussion

The DA 7250 calibration results for cassava show high accuracy and similar accuracy as the typical difference between two different reference labs on the same samples. are very accurate when compared to the results from the reference methods. Statistics for the respective parameters are presented in the table 1 and calibration graphs are displayed on second page.

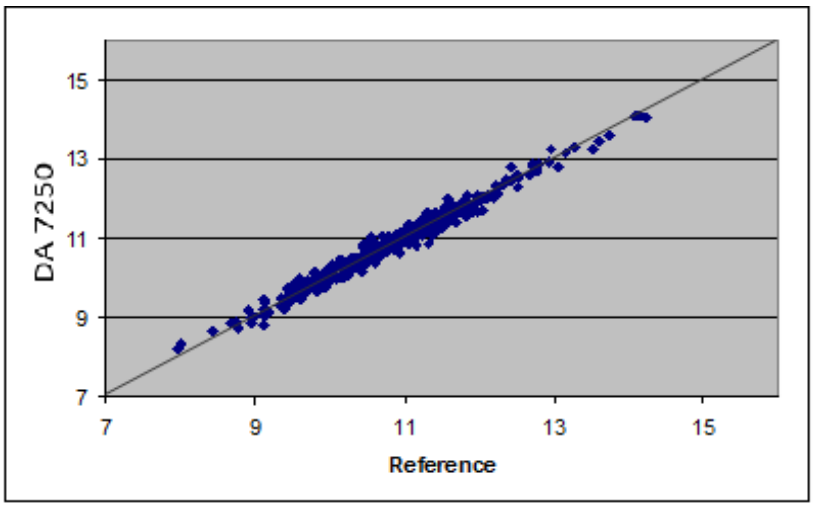
Parameter	*Range*	*Samples*	*R*
Moisture	7.97 – 14.64	200+	0.88
Starch	68.63 – 76.45	200+	0.79
Fiber	1.89 – 3.27	200+	0.87

Table 1

In summary it is concluded that the DA 7250 accurately can analyze moisture, protein, oil and fiber in canola meal with similar accuracy as the reference methods.

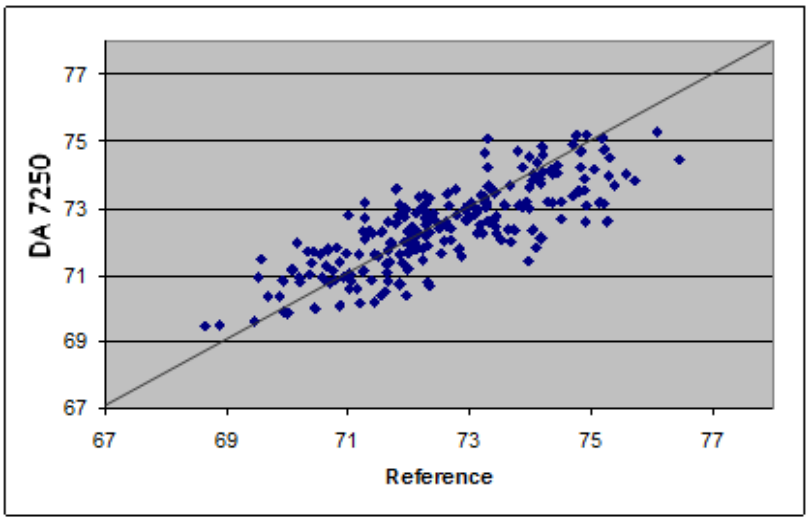
Moisture

The DA 7250 readily determines moisture in cassava. From quite dry samples to relatively high moisture ones, accuracy is excellent.



Starch

Starch is the most important quality characteristic of cassava when used for ethanol production. The DA 7250 determines starch with the same accuracy as the reference method.



Fiber

Fiber does not vary much between cassava samples, but the DA 7250 shows a very high correlation with the reference method.