

Perten Instruments Application Note

DA 7250 Analysis of Canola Meal

Analysis of Moisture, Oil, Protein and Fiber in Canola Meal Using the Diode Array 7250 Analyzer

Introduction

For rapeseed processors, feed and pet food manufacturers alike, rapid and accurate quality control of the rapeseed meal is important. For the rapeseed processor it means an opportunity to optimize the oil extraction process, and for the feed and pet food manufacturers the chance to improve least-cost formulations.



The Near Infrared Reflectance (NIR) technology is highly suitable for this purpose. NIR is an indirect analytical method, where 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 allow 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 only 6 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 ground and measured as powder or coarse meal.



Method

Several sets of samples from North America as well as Europe were measured on multiple DA 7250 instruments. The samples were analyzed, without grinding or other sample preparation.

Calibration models were developed to model the relationships between the instruments NIR spectra and the reference chemistry results. Model development was done using scatter correcting spectra pre-treatments and multivariate Partial Least Squares PLS regression.



Results and Discussion

The differences between the DA 7250 and the reference method are of the same magnitude as the typical difference between two laboratories. Statistics of developed calibrations are summarized in table 1.

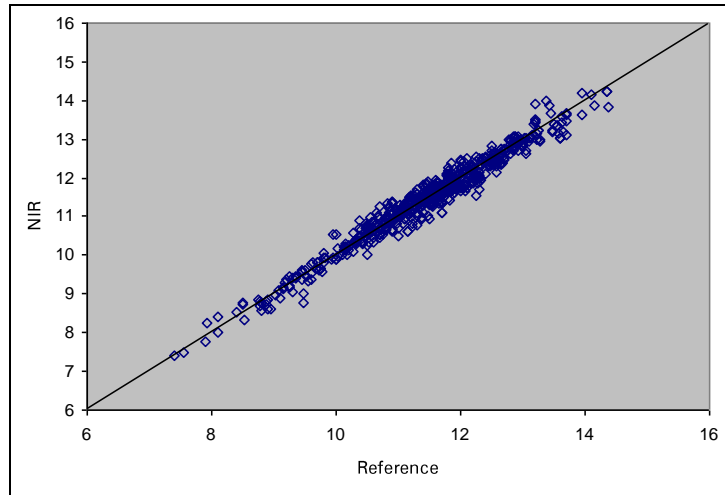
Parameter	Range	Samples	R
Moisture	7.4-15.3	800+	0.97
Protein	32.0-41.2	700+	0.95
Oil	0.5-12.9	700+	0.97
Fiber	8.3-16.5	600+	0.89

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.

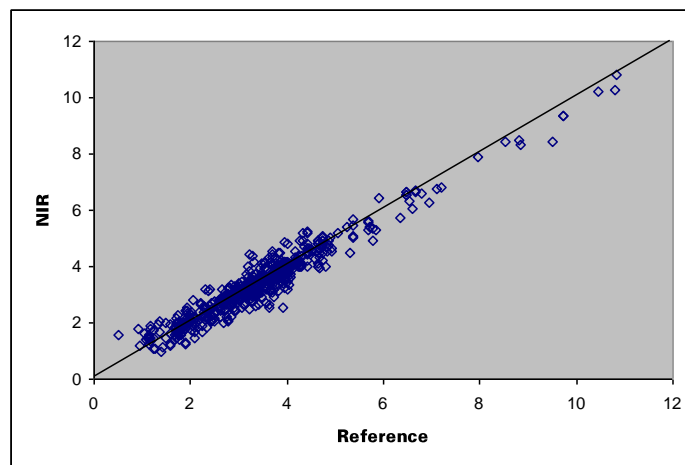
Moisture

The DA 7250 is very accurate for moisture. The calibration covers a wide range which makes it suitable both for optimizing the drying process as well as for verifying final product moisture.



Oil

The DA 7250 is accurate from the low oil contents found in the commercial product up to the higher oil contents found in process intermediates. This makes it a good tool both for processors and feed manufacturers.



Protein

The protein performance of the DA 7250 makes it an excellent tool for verifying conformance with specifications.

