

Perten Instruments Application Note

DA 7250 Analysis of Soy hulls

Analysis of moisture, protein, oil and fiber in soy hulls using the Diode Array 7250 Analyzer

Introduction

When handling and processing soy hulls, it is important to have accurate information on its composition. Moisture, protein, oil and fiber levels determine its value and how to use and process it.

The Near Infrared Reflectance (NIR) technology is highly suitable for this purposes. 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.



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.



Pre-installed NIR Calibration models are available for a wide range of products and parameters.

The DA 7250 instrument is IP 65 rated, allowing it to be used in the lab as well as in the production environment.

Method

Around 400 soy hulls samples were analyzed on DA 7250 instruments. Reference analyses were performed for moisture, protein, oil and fiber. 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 regression.

Results and Discussion

The DA 7250 proved to predict results very close to the results from the reference methods. Statistics are presented in the table 1 and calibration graphs are displayed on the following page

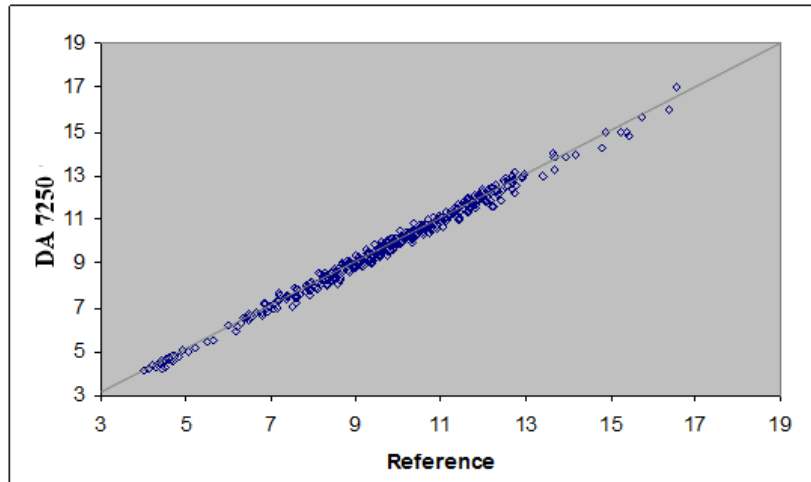
Parameter	Range	Samples	R
Moisture	4.03 – 16.55	400+	0.966
Protein	9.31 – 20.28	100+	0.987
Oil	0.59 – 5.31	300+	0.976
Fiber	27.51 – 41.30	100+	0.960

Table 1

In summary, it is concluded that the DA 7250 can determine moisture, protein, oil and fiber in soy hulls with very high accuracy.

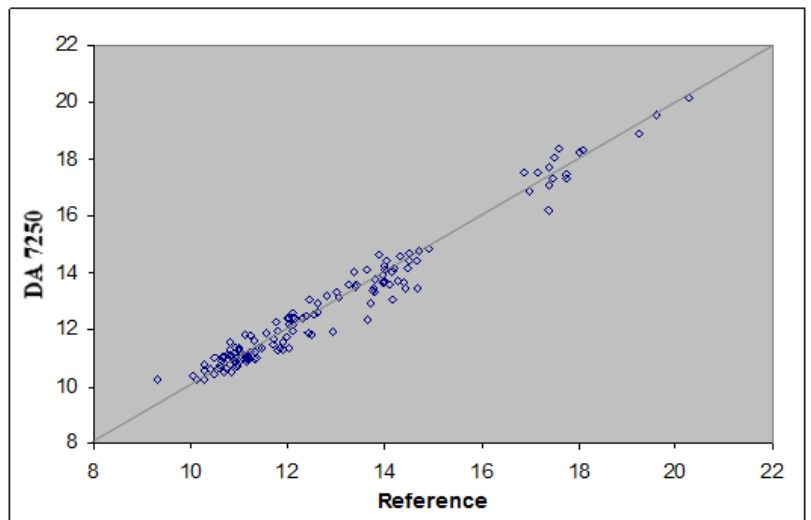
Moisture

The DA 7250 determines moisture with an excellent accuracy. The range is very wide and covers all from very dry to high moisture samples.



Protein

The DA 7250 accurately determines protein throughout the range, enabling processors and users of soy hulls to quickly test for protein.



Oil

Fat analysis is performed with a similar accuracy to that of the reference method.

