

Perten Instruments Application Note

DA 7250 Analysis of Rice Bran

Analysis defatted and full fat Rice bran with the DA 7250 Analyzer

Introduction

Rice bran is a by-product of the rice milling process, and is an important ingredient in many animal feeds. As such, its nutritional content is of high importance, and rapid analysis of parameters such as moisture, oil and protein are of great benefit to rice processors as well as feed producers.

The Near Infrared Reflectance (NIR) technology is highly suitable for these 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. The latest technology and software developments allows the benefits to be even further exploited with easy to use instruments, operation handling and 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. Pre-installed NIR Calibration models are available for a wide range of products and parameters.



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

Method

Approximately 100 samples of defatted rice bran from Asia, Europe and North America and 200 full fat rice bran samples from USA and India were measured on multiple DA 7250 units.

Calibration algorithms were developed to model the relationships between the instruments NIR spectra and the reference chemistry results of moisture, fat and protein. Model development were done using scatter correcting spectra pre-treatments and multivariate regression.

Results and Discussion

Table 1 summarizes statistics of developed calibrations for moisture, fat and protein in defatted rice bran and table 2 calibration for fat content in full fat rice bran. Figure 1 and figure 2 displays the Reference vs NIR calibration graph for moisture in defatted bran and fat in full fat bran.

The accuracy of measurements using the DA 7250 was similar to the reproducibility of the reference methods. Repeatability of measurements using the DA 7250 instrument was generally lower than reference method repeatability. Results can be displayed both as is and dry based on instrument based on automatic moisture correction calculation.

Parameter	Range %	Samples	R
Moisture	9.0 – 13.1	<100	0.98
Fat, asis	0.9 – 3.6	<100	0.99
Protein, asis	14.9 – 18.4	<100	0.77

Table 1. Defatted rice bran calibrations

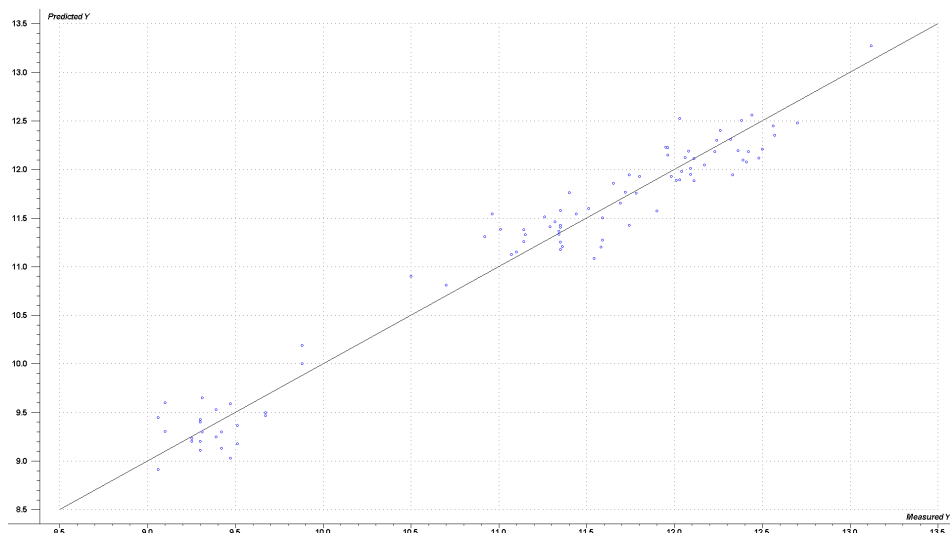
Parameter	Range %	Samples	R
Fat, asis	2.9 – 26.2	200+	0.98

Table 2. Full fat rice bran calibration

In summary, it is concluded that the DA 7250 accurately can analyze rice bran in a few seconds using large open rotating sample dishes

Moisture, defatted rice bran

The moisture results are very accurate across the range. DA 7250 will be an excellent tool for rapid and accurate determination of moisture in rice bran.



Fat, full fat rice bran

The DA 7250 measurement performance on fat is very good.

