

Analysis of Feather meal for Moisture, Protein, Fat and Ash using the DA 7200 NIR analysis system

Introduction

For processors as well as users of feather meal it is essential to be able to test samples for nutritional composition and rapid analysis of parameters such as moisture, protein, fat and ash are of great benefit.

The Near Infrared Reflectance (NIR) technique is particularly suited for measurement of these types of samples, but past instrument limitations have not permitted users to reap the full benefits of NIR. Sample preparation requirements such as packing special cups and carefully cleaning between samples made analyses laborious, time consuming and error-prone.

Diode Array 7200

The DA 7200 is a proven full-spectrum, NIR instrument designed for use in the rendering and feed industries. Using novel diode array technology it performs a multi-component analysis in only 6 seconds with no or little sample preparation required.

During these 6 seconds, a baseline is collected, noise monitored, wavelength accuracy is standardized, and a large number of full spectra are collected. Samples are analyzed in open-faced dishes, which removes any need for cleaning between samples.



Experimental

More than 400 samples from a large number of processing facilities were analyzed in multiple DA 7200 units.

Calibrations were developed by Perten Instruments using The Unscrambler chemometrics software by Camo. The regression method used was Partial Least Squares (PLS). SNV and Savitsky-Golay 1st derivatives were used as data pre-treatments to enhance some of the calibration models.

Results and discussion

The DA 7200 results are very accurate when compared to the results from the reference methods. Statistics for the respective parameters are presented in the table below and graphs are displayed on page 2.

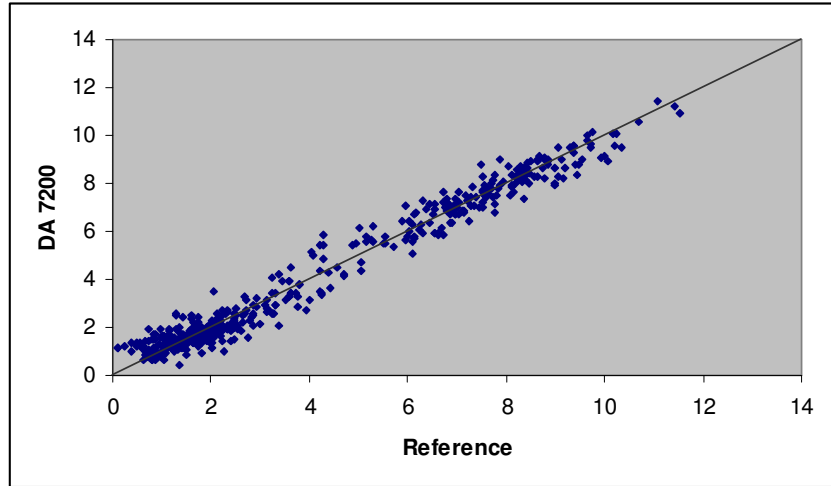
Parameter	Range	Samples	R
Moisture	0.11 - 11.54	400+	0.986
Protein	72.30 - 93.83	200+	0.978
Fat	2.68 - 17.59	400+	0.921
Ash	1.00 - 4.20	400+	0.696

The differences between the DA 7200 and the reference method are of the same magnitude as typical differences between two different reference labs. The DA 7200 is more precise than the reference methods meaning that replicate analyses are generally more repeatable and representative.

In summary it is concluded that the Diode Array 7200 can determine protein, moisture, fat and ash in feather meal.

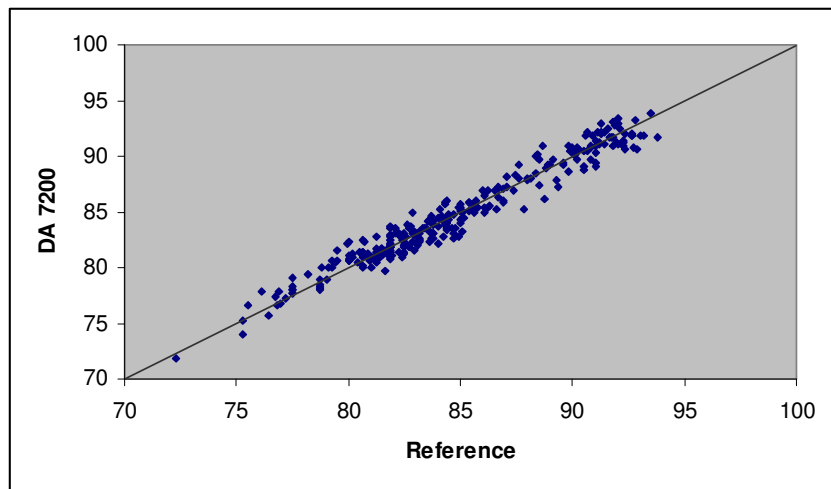
Moisture

Proper moisture levels affect the profitability of the plant as well as the quality of the product.



Protein

The DA 7200 accurately determines protein throughout the range, enabling processors and users of feather meal to quickly test for protein.



Fat

Fat analysis is performed with a similar accuracy to that of the reference method. The rapid analysis means results are available almost instantly.

