Analysis of Fish meal using the DA 7250 Analyzer

Introduction

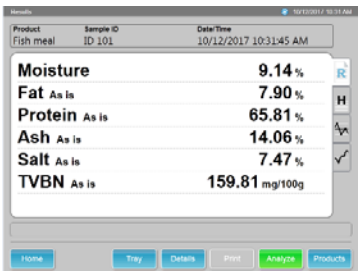
Fish meal is an important source of protein and other nutrients, used in feed and pet food production. Rapid compositional testing is vital to both producers and users. For fish meal producers it makes it possible to optimize production and verify end-product quality.

Users are enabled to verify shipments against specifications, and can improve formulations and save costs with true compositional data instead of book values.

The Near Infrared Reflectance (NIR) technology is highly suitable for these purposes. 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 uses novel Diode Array NIR technology and performs a multi-component analysis in less than 10 seconds. During this time a large number of full spectra are collected and averaged. Samples are analyzed in non-contact reflectance spectroscopy from above in large open cups, or even disposable petri dishes. This leads to a very large and representative sample volume analyzed and and there is no cleaning required or risk of sample cross-contamination. The instrument is handled by an intuitive and easy to use touch screen interface and is IP 65 water and dust proof for easy cleaning and placement in production area as well as laboratory.



Method

More than 3000 Fish meal samples were collected. Samples were analyzed on multiple DA 7250 instruments using open faced dishes. Collected samples spectra were combined with the respective laboratory reference values for Moisture, Protein, Fat, TVBN, Salt and Acidity.

NIR calibrations were developed with spectra scatter correction and multivariate regression. Several regression techniques were evaluated for calibration development, including ANN and Honigs Regression, a proprietary regression technique developed by Perten Instruments

Results and Discussion

The calibrated DA 7250 results were very accurate when compared to the results from the reference methods. Statistics for the respective parameters are presented in the table below and calibration graphs for Protein, Moisture and Fat are displayed on page 2.

Parameter	Range	Samples	R
Protein $_{\%\ asis}$	55.8 – 72.8	3100+	0.92
Moisture	2.2 – 11.0	3500+	0.93
Fat, $_{\%\ asis}$	4.9– 14.0	3600+	0.92
Ash, $_{\%\ asis}$	10.2 – 26.5	3500+	0.85
TVBN $_{mg/100g\ asis}$	58 - 250	2900+	0.8
Salt $_{\%\ as\ is}$	0.7 – 9.9	1800+	0.9
Acidity $_{mg/KOH/g}$	4.7 – 8.6	400+	0.85

Table 1

It is concluded that the DA 7250 can accurately analyze Moisture, Protein, Fat, Ash, TVBN, Salt and Acidity in Fish meal in less than 10 seconds.

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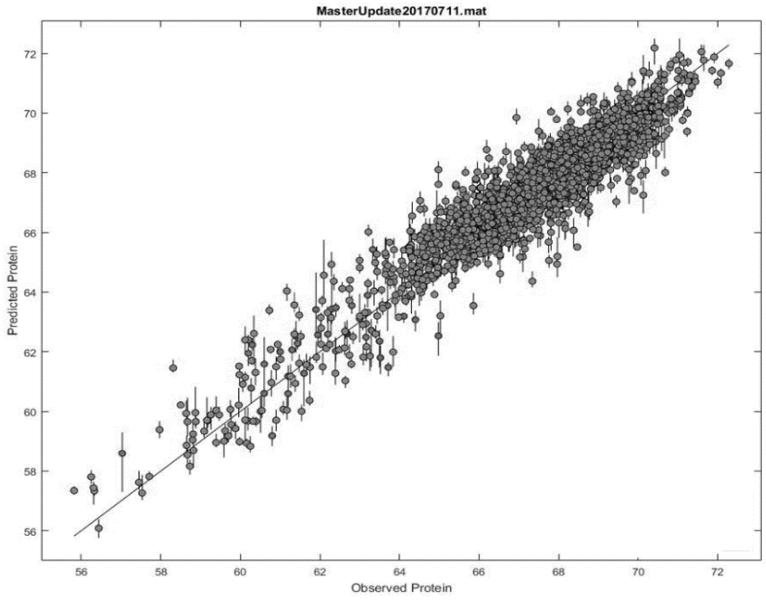
a PerkinElmer company

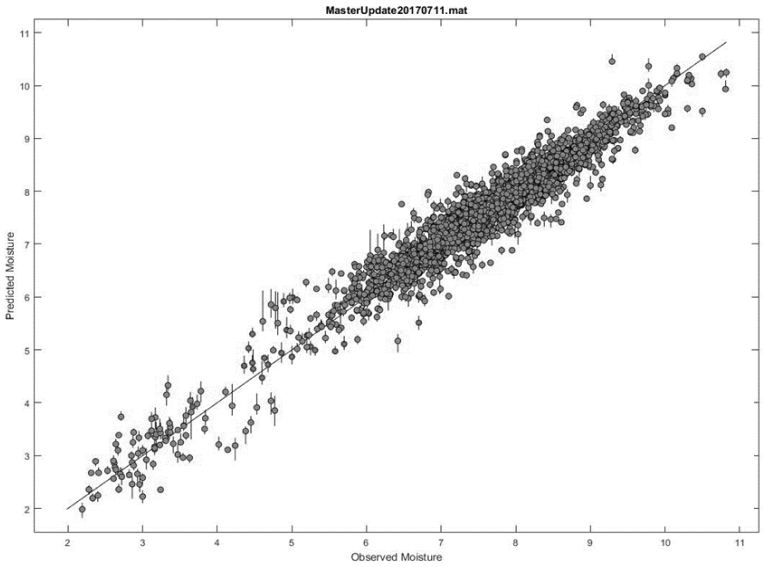
Protein

The accuracy for protein is excellent and the DA 7250 can be used for optimizing protein contents during fish meal production and to verify contents at receival.



Moisture

The Moisture calibration is very accurate over a large moisture range and large product composition variability.



Fat

The Fat calibration is very accurate as well as robust. DA 7250 measurements can be used to verify fat contents in fish meal content over a wide fat range.