

Corn starch:

Quantification of moisture content using portable NIR

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Objective: To show the feasibility of using portable NIR technology as an accurate means of predicting the moisture content in corn starch food products.

The ASD LabSpec[®] 5000 NIR spectrometer (spectral region 350-2500nm) was the instrument used for this analysis. It was coupled to a bi-furcated reflectance probe via a fibre optic cable and industry standard SMA 905 connectors. 70 different starch samples were obtained, and three spectral reflectance measurements were collected on each sample. A spectrum averaging of 25 was used to optimise the signal to noise ratio, however, since the ASD LabSpec[®] 5000 has a 100 millisecond scan time, each spectral acquisition was completed in just 2.5 seconds.

For a background subtraction, a reference spectrum was collected using a Spectralon[™] reflectance standard disc. Once spectral data collection was completed for the samples, they were then analysed for moisture content via the oven drying and weighing method. Primary oven dry results were then correlated to the relevant NIR spectra already measured on the ASD LabSpec[®] 5000. Grams/AI[™] chemometric software package with PLS/PlusIQ[™] was used for the multivariate analysis and calibration model construction. The correlation coefficient (R^2) was calculated at 0.958 and the standard error of cross validation (SECV) was calculated to be only 0.081% at 6 recommended factors or principal components.

It was concluded that the technology employed by the ASD LabSpec[®] 5000 NIR analyser is ideal for making accurate predictions of the moisture content in corn starch. Results are obtained in just seconds from instrumentation which can be placed at-line and/or used in a portable manner, thus providing immediate answers when and where they are needed most.



Fig. 1 – The portable ASD LabSpec[®] 5000 being used for food analysis

To learn more about the ASD LabSpec[®] 5000 and other portable / handheld NIR spectroscopy solutions please visit www.analytik.co.uk (UK and Ireland) or alternatively visit www.asdi.com or www.polychromix.com.