Application Note 155. Calibration of Oil, Moisture and Protein in Canola Meal using a CropScan 2000B NIT Analyser

Introduction:

Canola seeds are rich in oil and protein. The oil is commonly used to manufacture margarine because of the low level of unsaturated fats in the oil. The oil is commonly extracted from the seeds by crushing and leaves a canola meal which is has a very high protein content. A low level of residual oil in the meal is important since the oil is more valuable than the meal however crushing can only get to a level before solvent extraction is required to remove more oil.

Canola meal is sold to the animal feed industry as a source of protein. The residual oil of 3-5% is considered acceptable and does supplement the fat required in animal feeds. However too high oil content is undesirable due to rancidity and the possible higher presence of glycosinolates in the meal.

Procedure:

25 samples of canola meal were scanned in triplicate using a 5mm pathlength powder cell in a CropScan 2000B Near Infrared Transmission Analyser, (NIR Technology Systems, Bankstown, NSW, Australia). Figure 1 shows the NIT spectra for these samples.

Each sample had laboratory data for oil, moisture and protein. The NIT spectra saved and then imported into NTAS (NIR Technology Analysis Software) where Partial least Squares Regression analyses were performed in order to develop suitable calibrations.

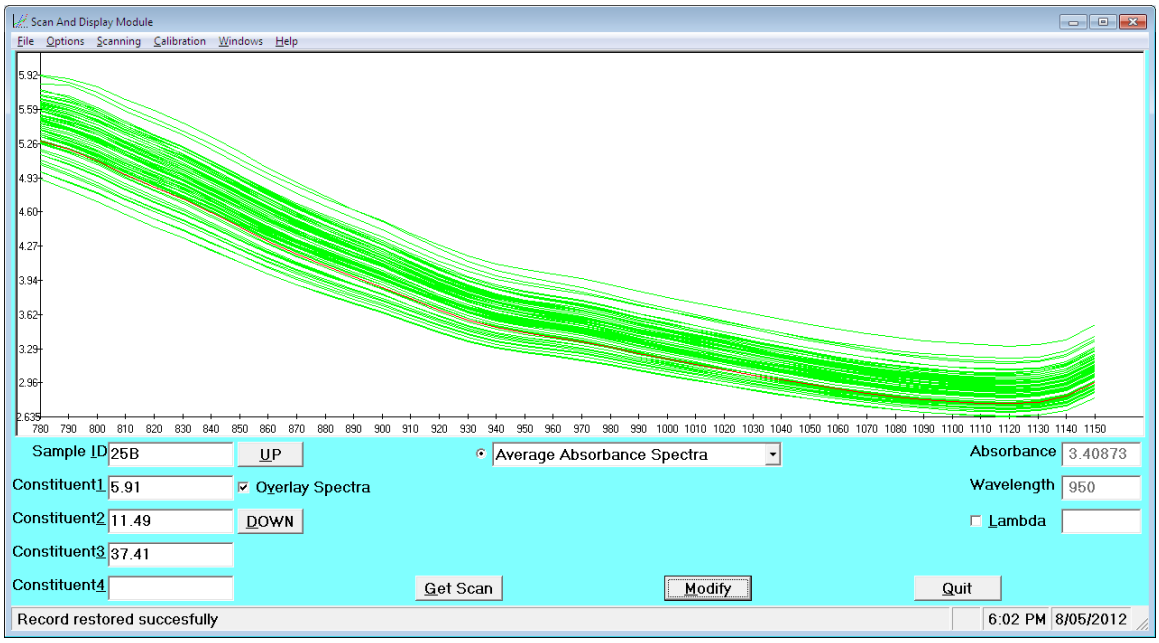

Figure 1. NIT Spectra of Canola Meal

Results:

The following plots show the calibration data for oil, moisture and protein.

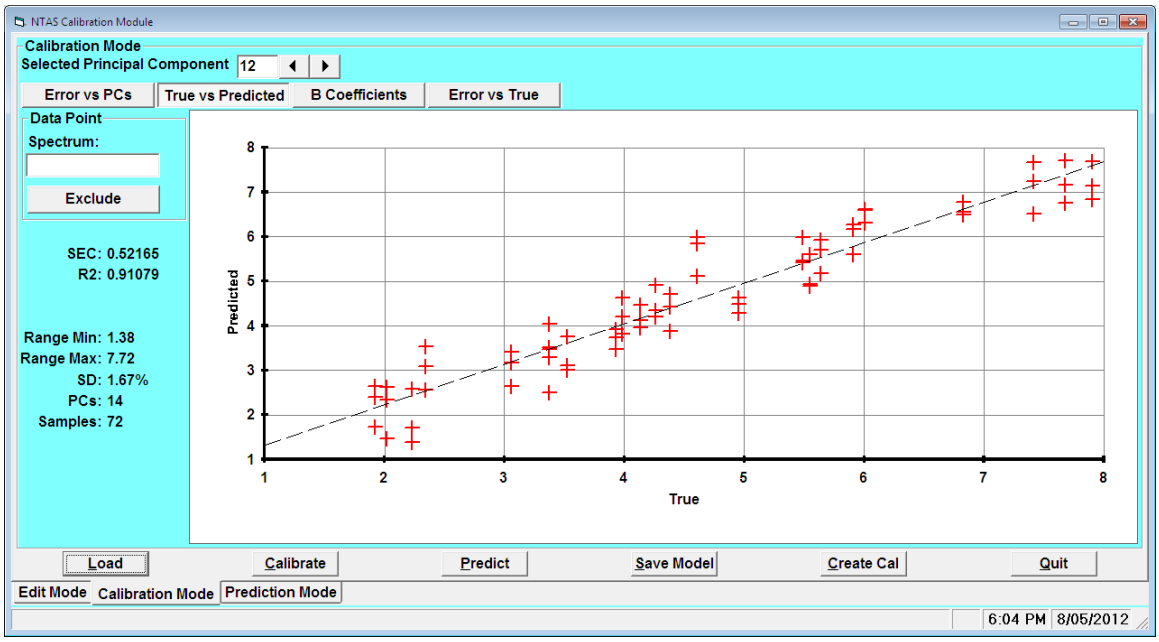

Figure 2. Calibration Plot for Oil in Canola Meal

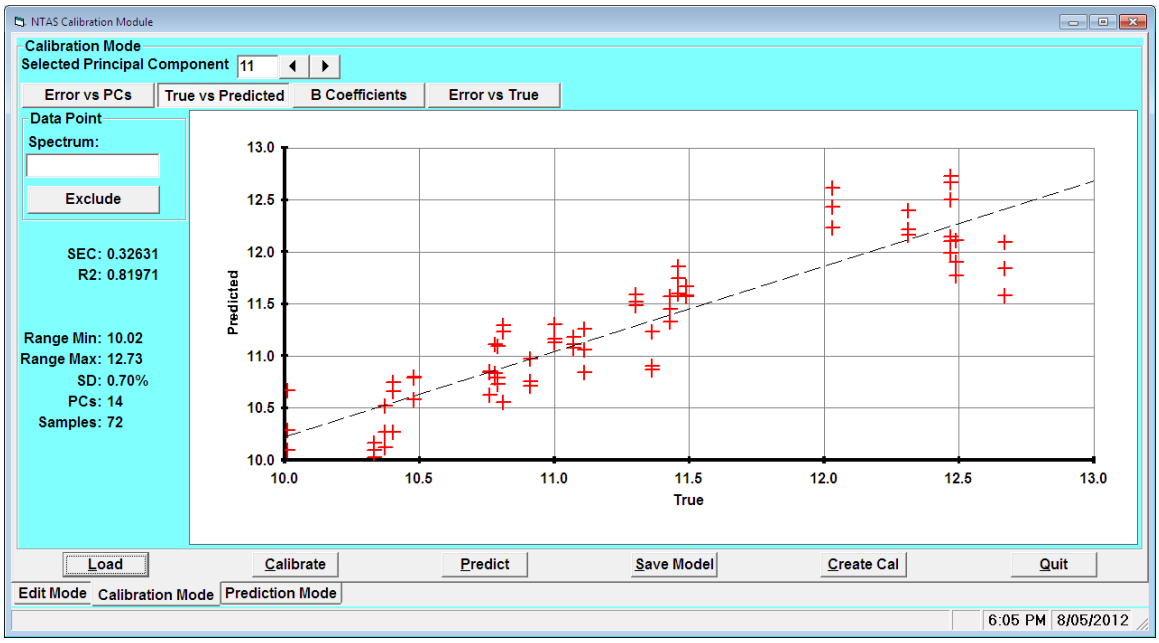

Figure 3. Calibration Plot for Moisture in Canola Meal

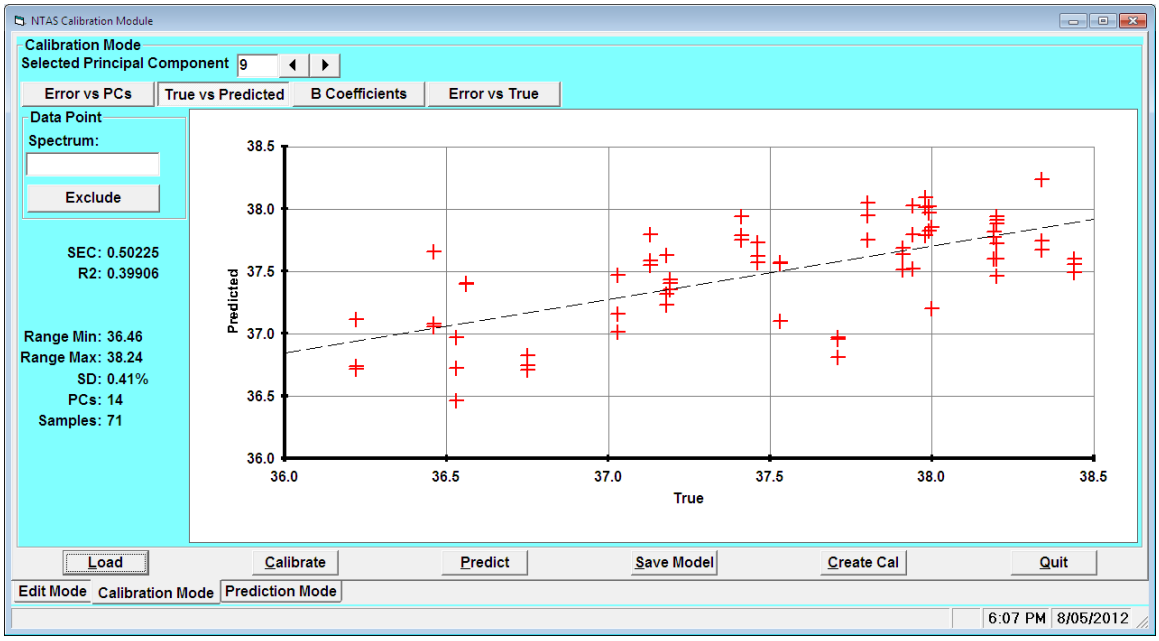

Figure 4. Calibration Plot for Protein in Canola Meal

Conclusion:

The data shows that the CropScan 2000B can be calibrated for oil, moisture and protein in canola meal. A broader range of protein in more samples would improve the accuracy of the protein calibration.

NIR Technology Systems
366 Edgar Street, Condell Park, NSW, 2200, Australia
Tel: 612 9708 5068, Fax: 612 9708 5537
Email: nirtech@nirtech.net, Web: www.nirtech.net