Introduction:

NIR systems have long tested protein in grains including corn and other raw materials that are used in the creation of Stock feed. The texture of the feed when in storage is similar to that of shell grit. After testing several methods of sampling, it was determined that use of a standard squeeze cell with an additional spacer proved the best solution.

This study was undertaken to demonstrate the feasibility of measuring Protein in the finished product of stock feed. The Cropscan2000B was used for the purpose of this study.

Procedure:

36 samples of stock feed were selected and then placed in the squeeze cell of the Cropscan 2000B and scanned over the wavelength range of 720nm to 1100nm at a pathlength of 8mm. A total of 10 scans were collected and each sample was repacked and presented to the instrument twice. The spectra were uploaded into NTAS (NIR Technology Australia Software) and Partial Least Squares Regression (PLS) was used to develop a calibration for Protein and Moisture.

Results:

Figure 1, below, shows the NIT spectra of the 36 samples of stock feed.
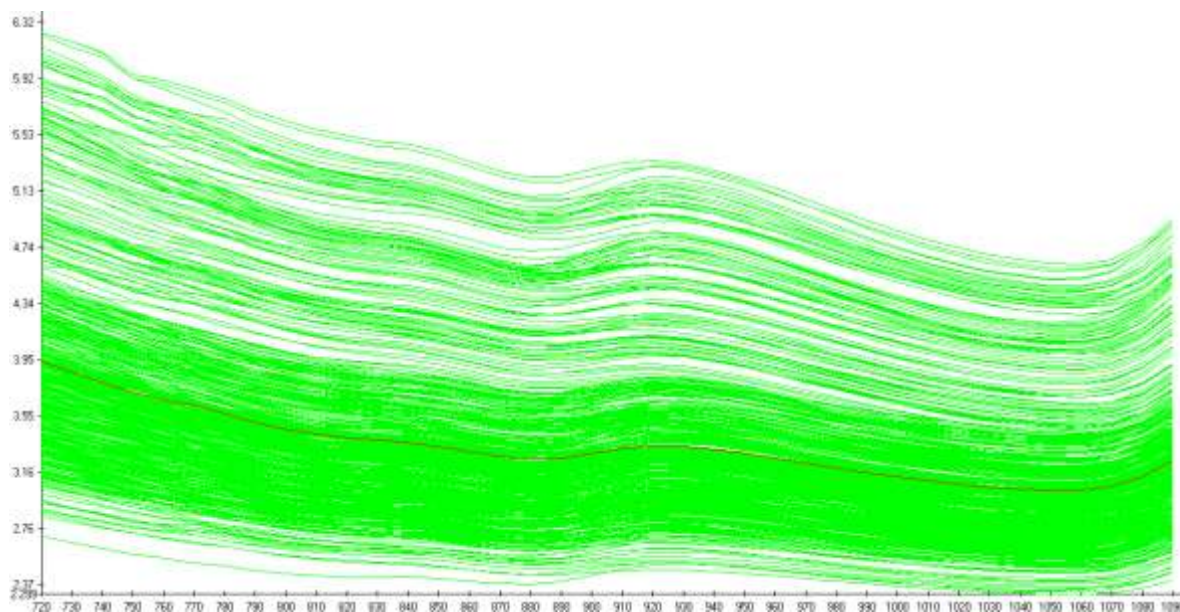

Figure 1: Plot of NIR Spectra for scanned stock feed.

Figure 2 shows the calibration statistics for the NIR Protein values versus the reference Protein value. The Standard Error of Calibration is 0.66% with a correlation (R^2) of 0.92.
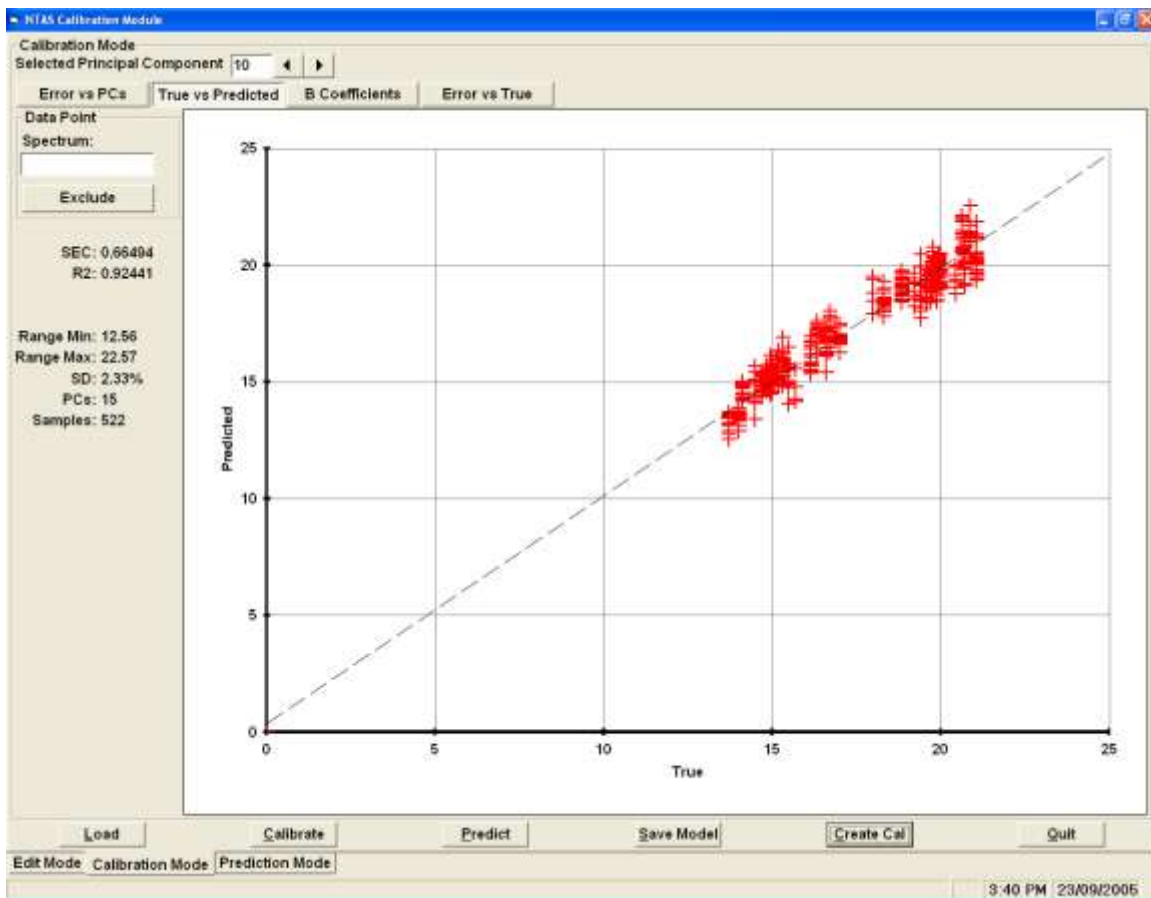
Figure 2: Plot NIR Predicted Protein value vs. Reference Protein value.

Conclusion:

It can be seen in figure 2 that the Cropscan 2000B can be calibrated to measure the Protein values of Stock Feeds. Whilst the sample set is sufficient to develop a calibration for Protein it is still recommended that the sets be expanded to improve the robustness of the calibration in future.

The available samples clearly demonstrate the ability of the Cropscan 2000B to measure Protein in Stock Feeds. With additional reference data for Moisture and Fat the calibration could be expanded to include these new and useful constituents. However, the available data clearly demonstrates the ability of the Cropscan 2000B to measure the stock feeds in a raw state.