

## Introduction:

NIR Technology Australia instruments have rarely been used to test for the quantity of salt in any products. This is primarily due to the relatively small amounts of salt in the greater majority of products. However, the quantity of salt in corn chips being higher in volume than most products does allow for the use of NIR instruments in it's measurement.

The corn chips were ground to a consistent texture and testing was conducted using numerous sampling methods. After this testing it was determined that use of a standard 8mm squeeze cell provided the best solution.

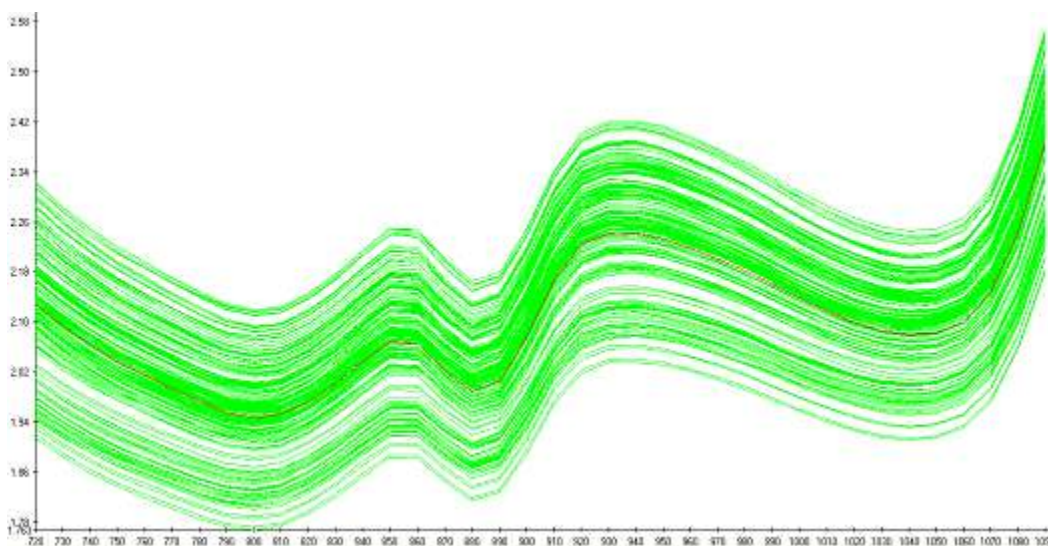
This study was undertaken to demonstrate the feasibility of measuring Salt in corn chips. The Cropscan2000B was used for the purpose of this study.

## Procedure:

10 samples of ground corn chip were provided by the manufacturer and then placed into 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 Salt.

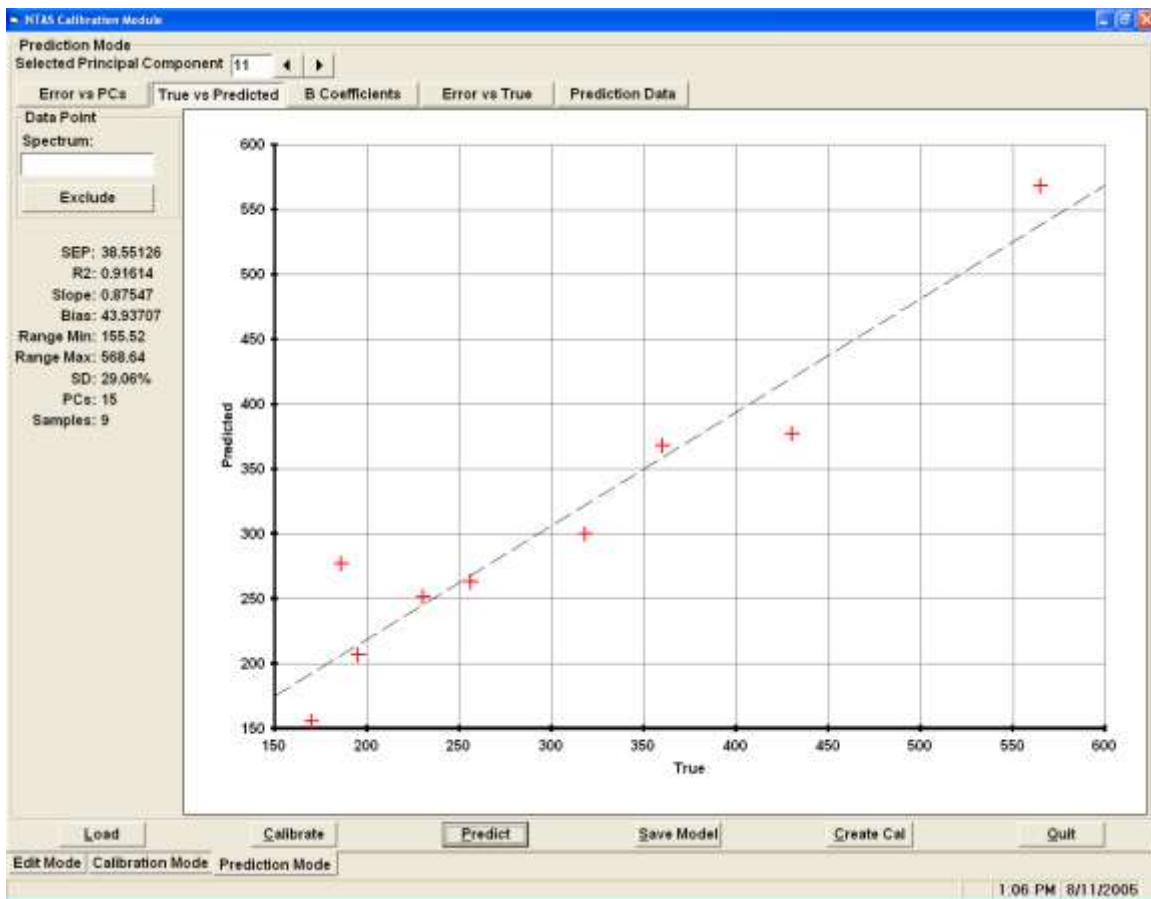
## Results:

Figure 1, below, shows the NIT spectra of the 10 samples of ground corn chips.



**Figure 1:** Plot of NIR spectra for scans of ground corn chips.

Figure 2, below, shows the calibration statistics for the NIR Salt values versus the reference Salt values. The Standard Error of Calibration is 38.55mg/100g with a correlation ( $R^2$ ) of 0.91.



**Figure 2:** Plot NIR Predicted Salt value vs. Reference Salt value.

## Conclusion:

It can be seen in figure 2 that the Cropsan 2000B can be calibrated to measure the salt values in ground corn chips. Whilst the sample set is insufficient to develop a calibration for Salt, it is still capable of demonstrating the potential for the prediction of salt. It is recommended that the sets be expanded to improve the robustness of the calibration in future.

Whilst the available samples clearly demonstrate the ability of the Cropsan 2000B to measure salt, care must be taken in the packing of the squeeze cell. The cell will need to be consistently packed on each occasion without over or under packing the cell.

With additional reference data for Moisture and Fat/Oil the calibration could be expanded to include these new and useful constituents. However, the available data clearly demonstrates the ability of the Cropsan 2000B to measure the ground corn chips.