

Introduction:

Near Infrared Spectroscopy has been proven to measure fat, protein and water content of raw meat and processed meats. A simple study was undertaken to demonstrate the ability of the Series 3000 Food Analyser to be calibrated for Burger Patties.

Description:

7 packages of Burger Patties were purchased from a local supermarket. 3 sets of 2 burger from each pack were loaded into a sample cell with a 12mm pathlength. The meat was compressed into the sample cell and the excess scrapped off to provide a flat layer of meat. Each sample was scanned in the Series 3000 Food Analyser in the Transflectance mode. The spectra were stored in the instrument and uploaded to NTAS, a chemometrics software package where spectra can be plotted and PLS calibrations developed.

Results:

The figure 1 and 2, show the NIT and 2nd Derivative NIT spectra of the 21 meat samples. The 2nd Derivative spectra illustrate the areas of the spectra where protein, moisture and fat absorb NIR energy.

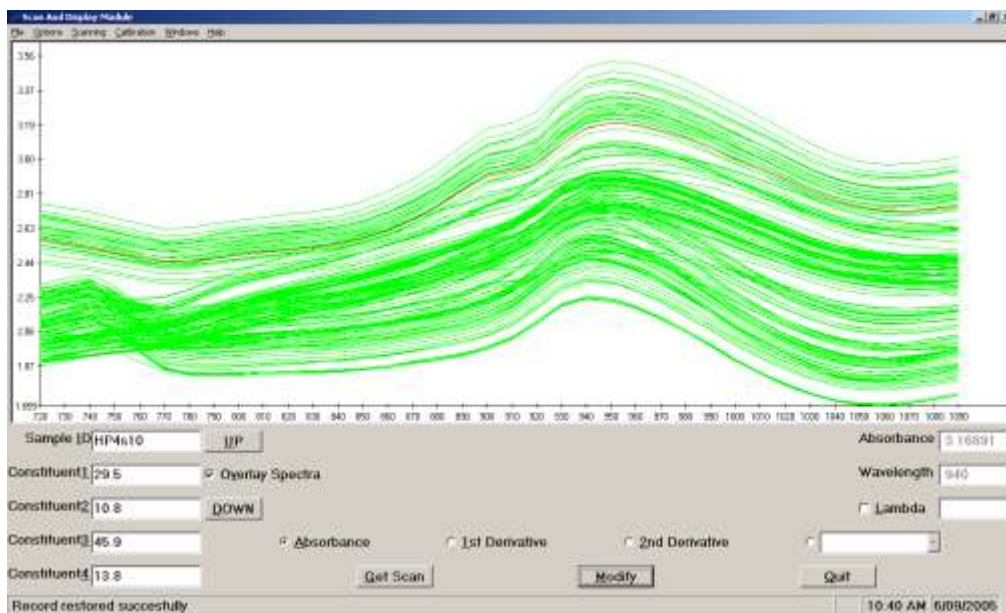


Figure 1. NIT Absorbance Spectra of Burger Patties

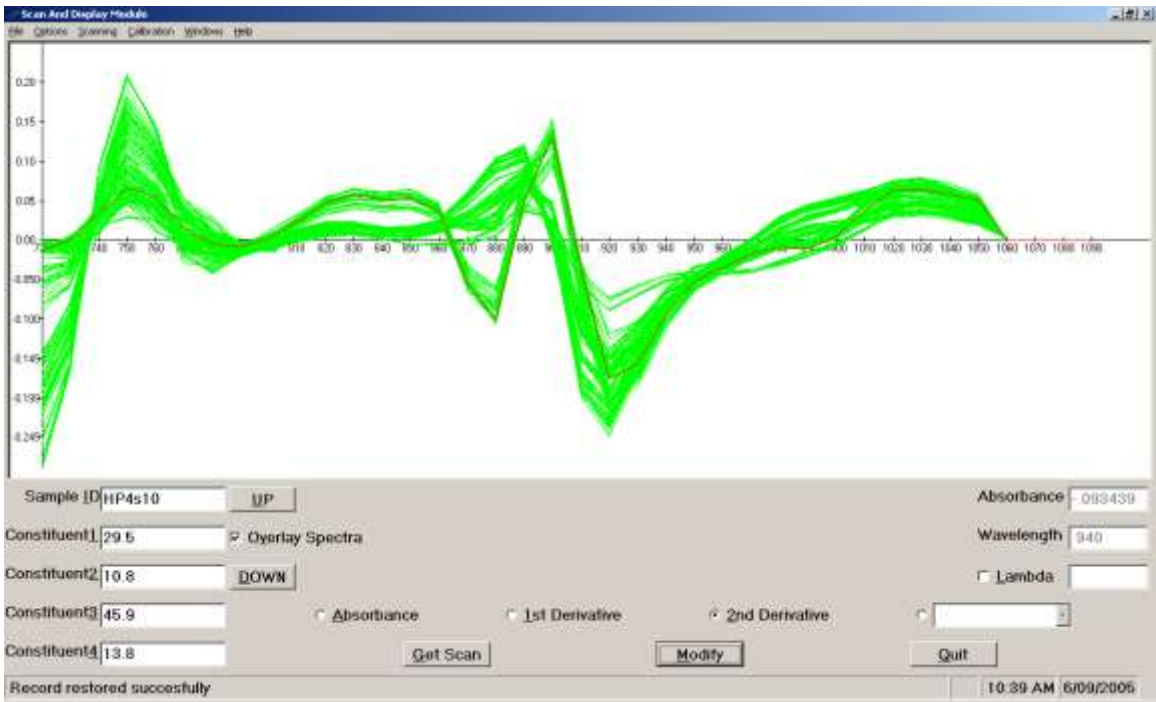


Figure 2. 2nd Derivative Spectra of Burger Patties.

Figures 3 to 5, show the calibration plots and statistics for Fat, Protein and Water. It should be noted that the the water content was calculated by the difference between the fat, protein and other components and the total weight of the sample.

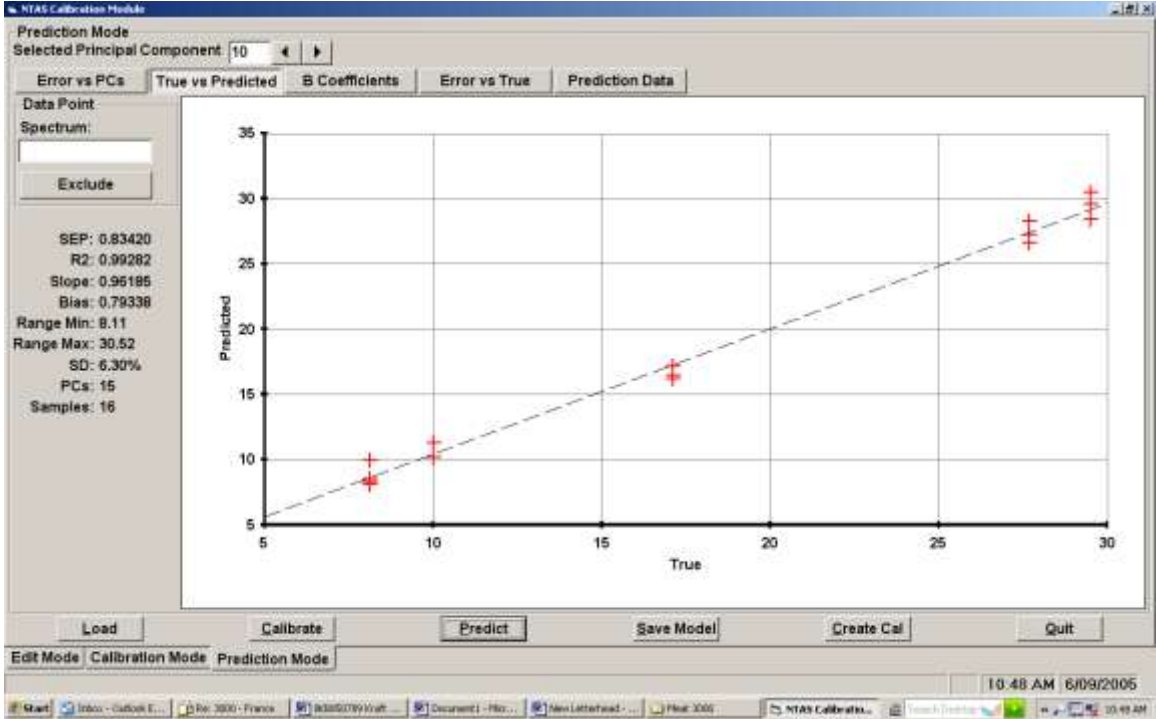


Figure 3. Fat Calibration Data

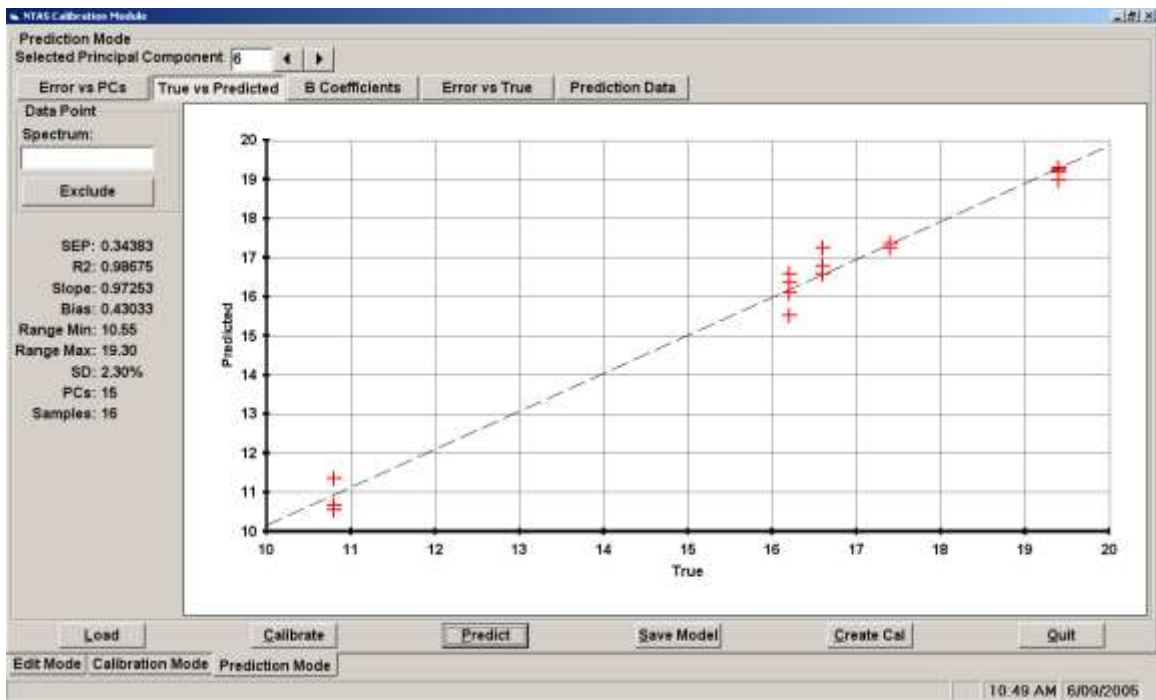


Figure 4. Protein Calibration Data

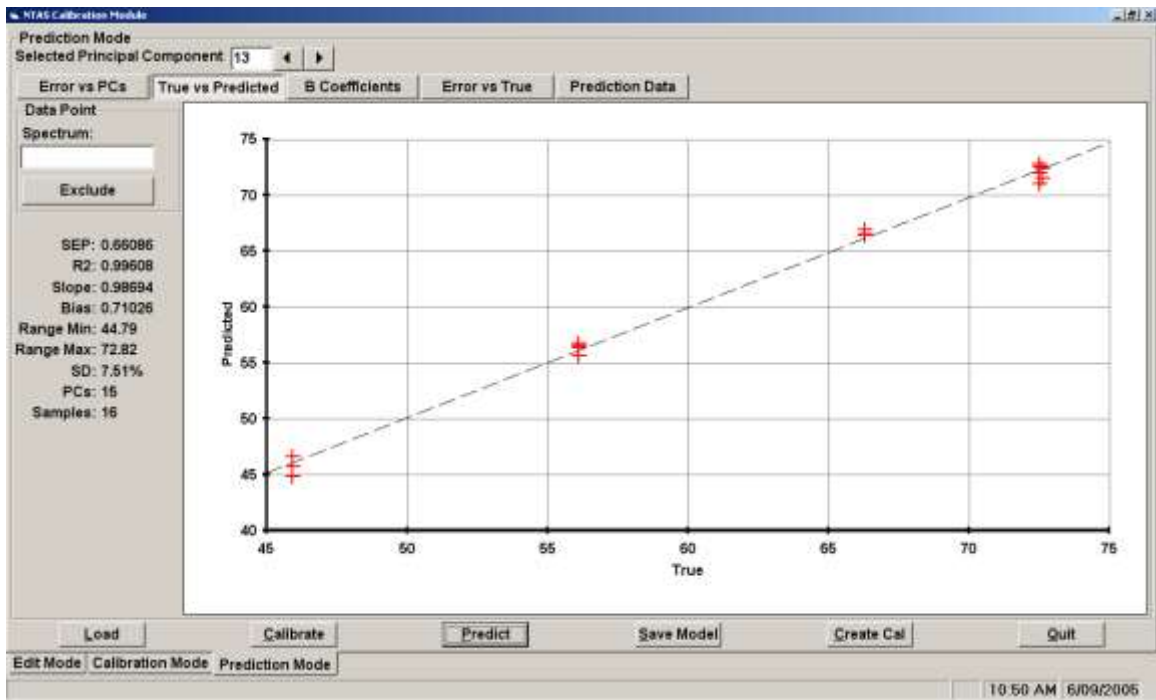


Figure 5. Water Calibration Data

Comments:

This study is only intended for the purpose of demonstrating the ability of the Series 3000 to be calibrated for measuring fat, protein and water in meat. The lab data for each component was taken directly from the nutritional label. As such there may be sources of error that individual analysis of each sample may reduce the calibration errors.