

# Application Note 90: Meat Samples Analysis using the Series 3000 Food Analyser



## Introduction:

NIR analysis of processed meat samples, eg, hot dog, corn dog, sausage mix, burger mix, turkey, ham and chicken mixes, is well established. This study demonstrates the ability of the Series 3000 Food Analyser (NIR Technology Australia, Bankstown, NSW, Australia), to be calibrated for fat, moisture and protein in meat mixes.

## Description:

24 samples of processed meat mix were scanned in the transmission mode through a 14 mm thick layer of meat packed into a glass petri dish. Each sample was scanned 10 times to produce 240 NIT spectra from 720-1100nm. These spectra were imported into NTAS (NIR Technology Australia Software). A Partial Least Squares Regression (PLS) analysis was performed on the 240 spectra to develop calibration models for fat, moisture and protein. 6 more samples of meat mix were analysed using the calibrations developed. These samples were used as a validation set.

## Results:

Figure 1. shows the NIT spectra of the 24 meat samples.

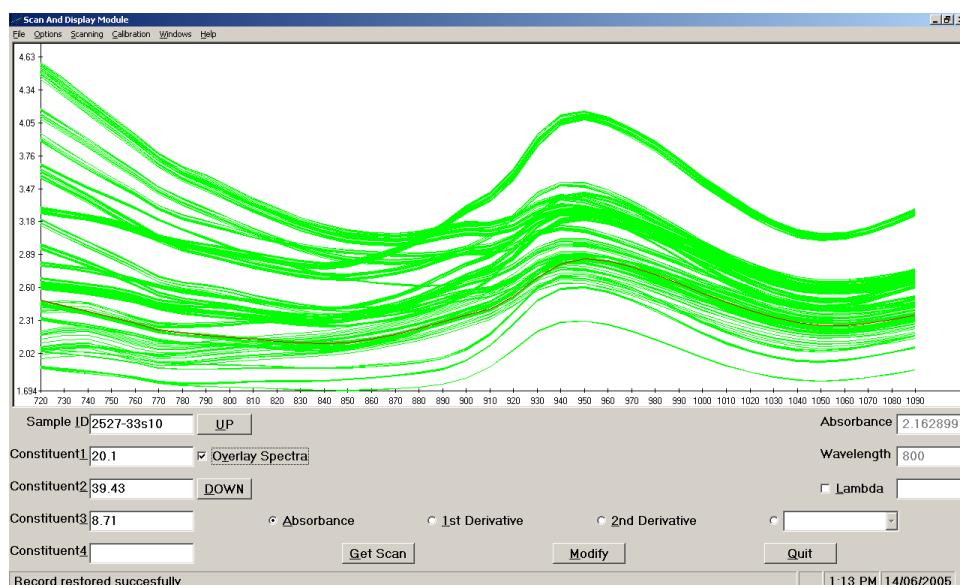


Figure 1. NIT Spectra of Meat Mixes

Figures 2, 3, and 4, shows the calibration plots for fat, moisture and protein.

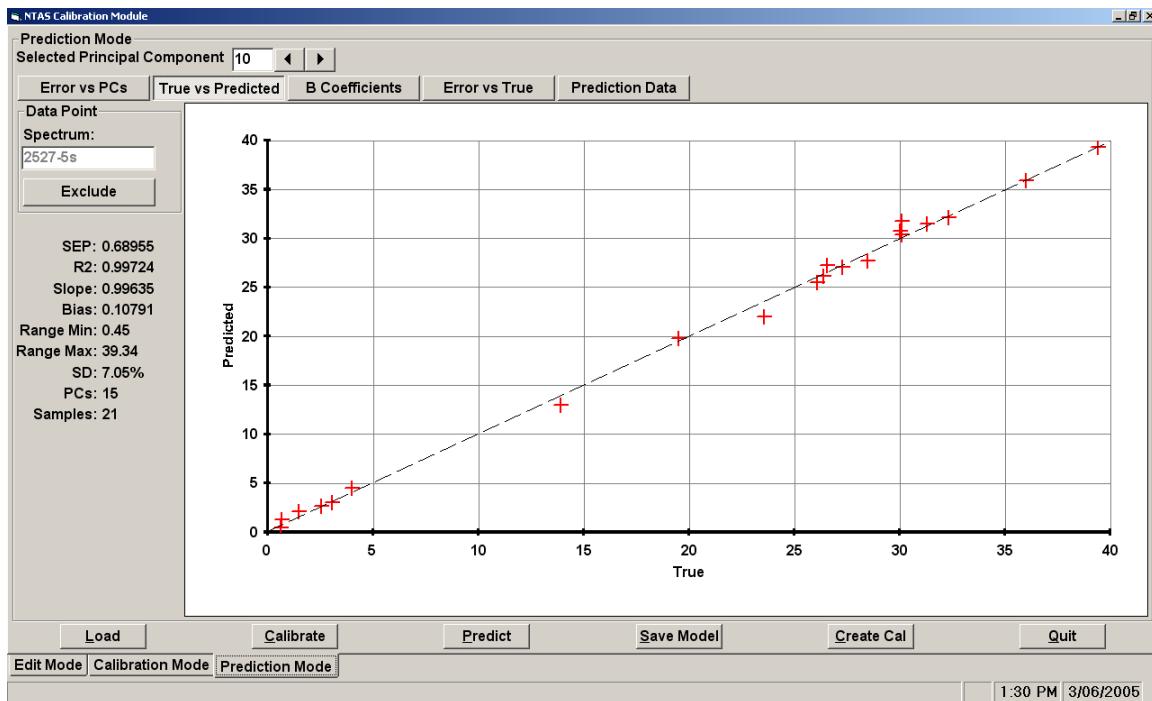


Figure 2. Fat Calibration Plot

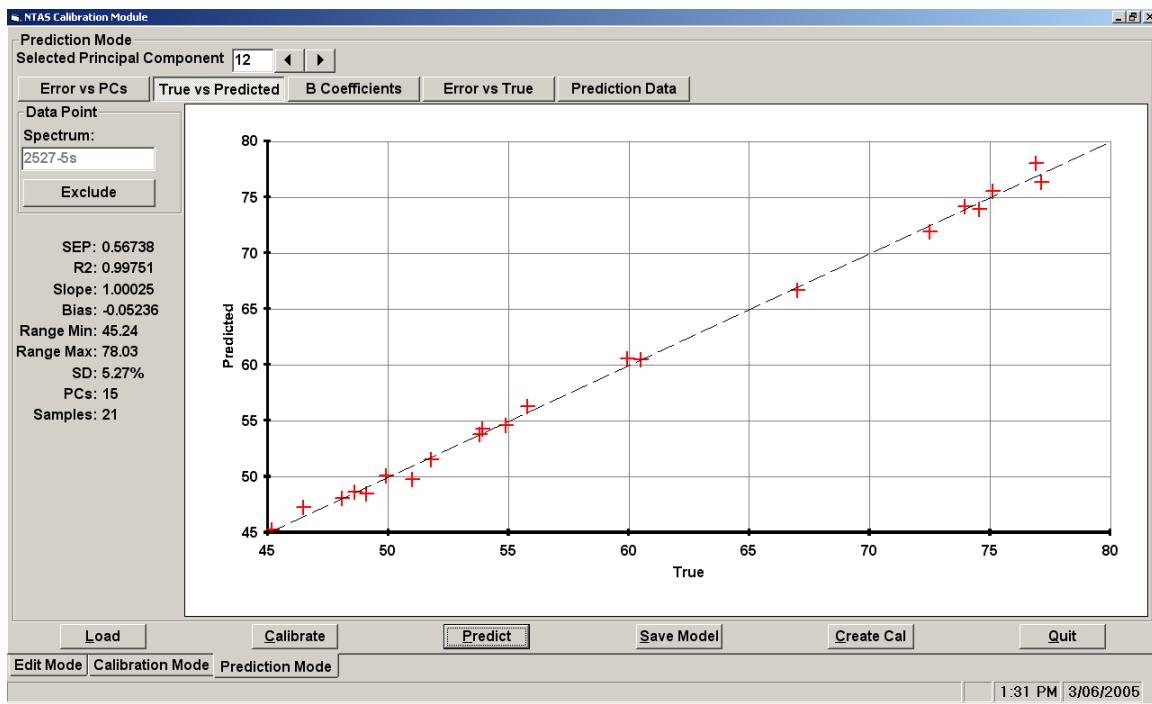


Figure 3. Moisture Calibration Plot

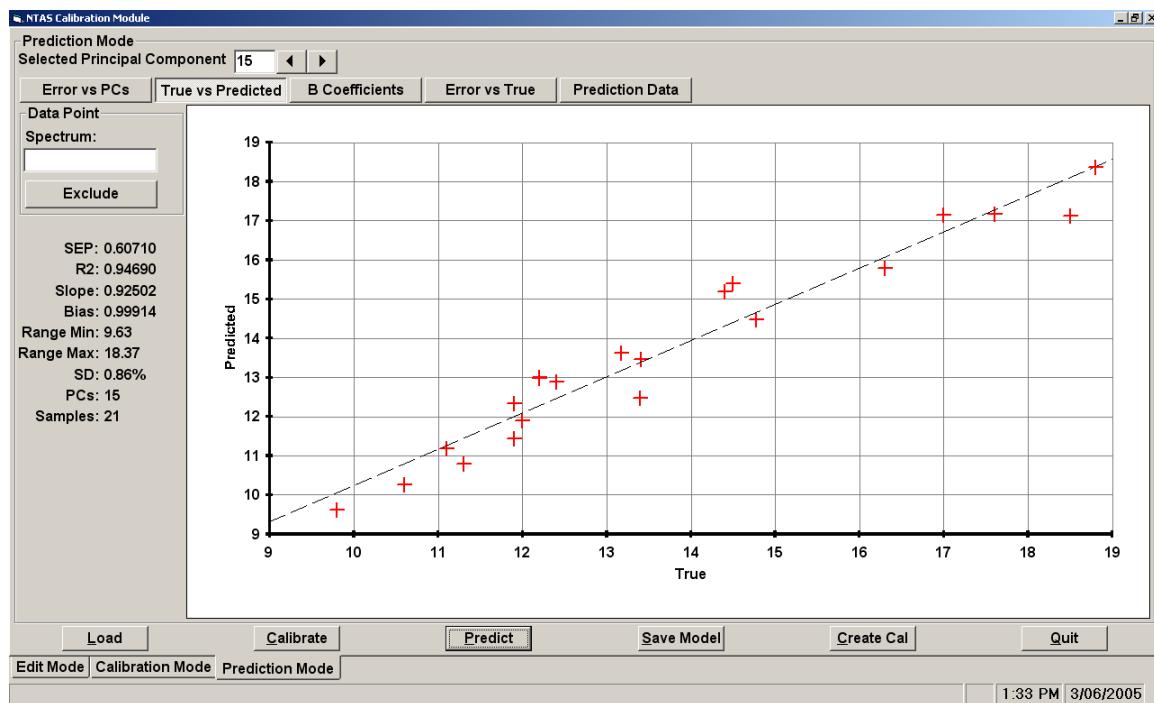


Figure 4. Protein Calibration Plot

### Prediction:

Figures 5, 6 and 7, shows the prediction plots for 6 samples of meat mix analysed using the Series 3000 Food Analyser and the reference or lab values.

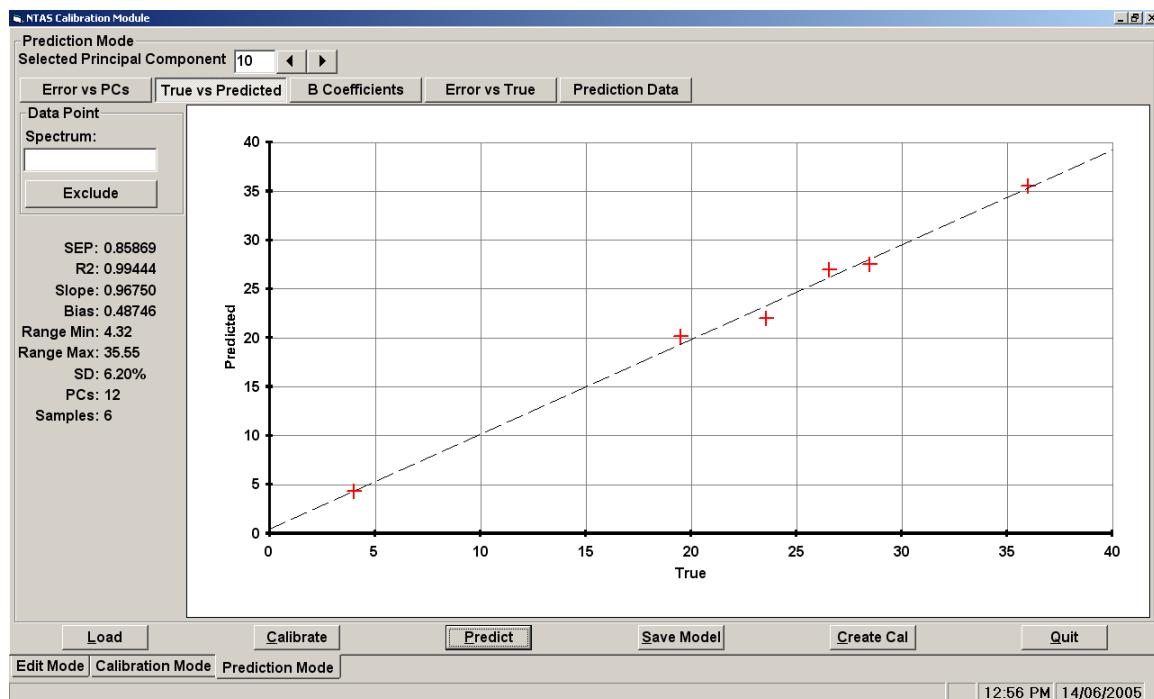


Figure 5. Fat Prediction Plot

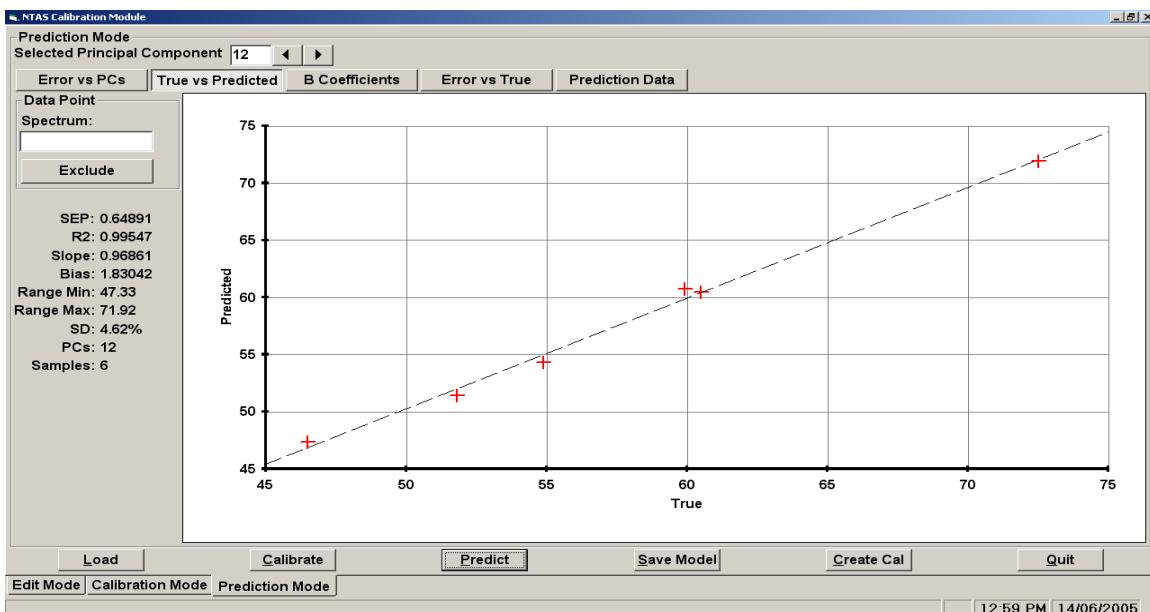


Figure 6. Moisture Prediction Plot

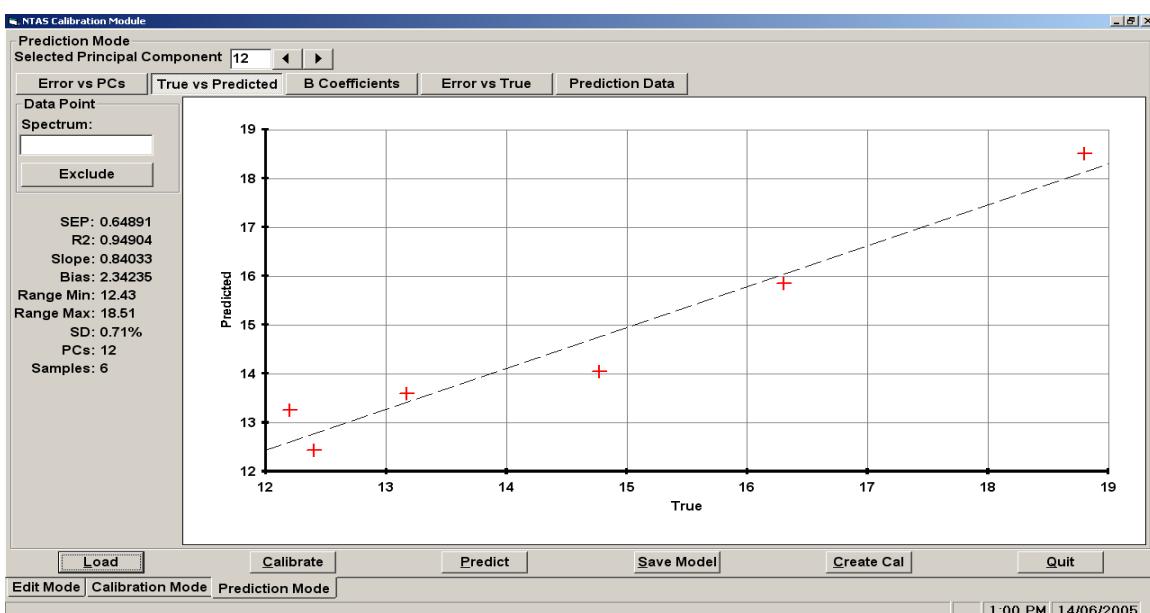


Figure 7. Protein Prediction Plot.

Table 1. shows the results for calibration and prediction.

	Fat	Moisture	Protein
SEC	.69	.57	.60
R <sup>2</sup>	.997	.997	.945
SEP	.84	.65	.65
R <sup>2</sup>	.994	.995	.949

### Discussion:

Although the number of samples for calibration was only 24, the PLS calibration developed provided an adequate means of predicting further meat samples. To ensure the calibration is more robust, further samples should be added to the calibration set.