Application Note 157. Analysis of Feta Cheese using the Series 2000 Near Infrared Transmission Analyser

Introduction:

Feta cheese is a common cheese product from Greece and the Middle East. Traditionally made from goat milk, feta is cured in brine after fermentation and removal of the whey. Feta is a hard, crumbling style of cheese that is usually diced into cubes and served in salad, or used in cooking. The measurement of fat, moisture and salt are important for ensuring the texture, taste and stability of the feta.

Reduced fat feta is not traditional product however in the western nations, reduced fat foods are more marketable.

This study demonstrates the use of the Series 2000 NIT Analyser to measure normal and reduced fat feta cheese quickly and accurately.

Procedure:

Approximately 20 pieces of feta and reduced fat feta were provided in brine. The samples were ground into a homogeneous crumb using a food processor. 70 grams of each sample were weighed into a 10mm pathlength Squeeze Cell (figure 1) and then scanned in the Series 2000 NIT Analyser. A portion from each sample was tested for fat using the Mojonnier method and for moisture using the oven drying method. The cell folds to compress the cheese crumb in between two glass windows. The cell is moved down and up in front of the instrument's light beam. Light passes through the sample and is collected into a diode array spectrometer that scans from 720-1100nm. Protein (N-H), Fat(C-H), Water (O-H) and Carbohydrates(C-O-H) absorb light at specific frequencies. The amount of light absorbed at each frequency is proportional to the concentration of each component. The NIT spectra were collected for each sample and stored in the Series 2000. The spectral files were imported into NTAS (NIR Technology Analysis Software) where the reference values for protein, fat and carbohydrate were appended and a Partial Least Squares Regression analysis was performed to develop calibrations for fat and Moisture. A calibration for salt in processed cheese was added to the models for fat and Moisture.

Results:

Figure 2. shows the NIT spectra of the feta cheese samples.

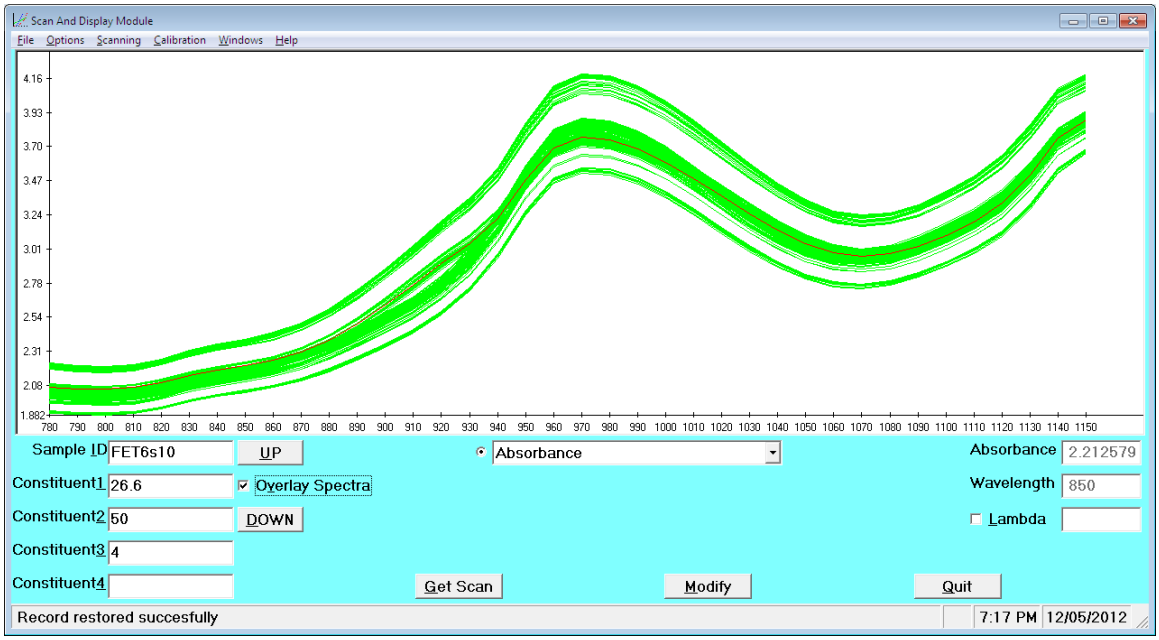

Figure 2.

Figures 3 through 5 show the calibration plots for fat, Moisture and salt.

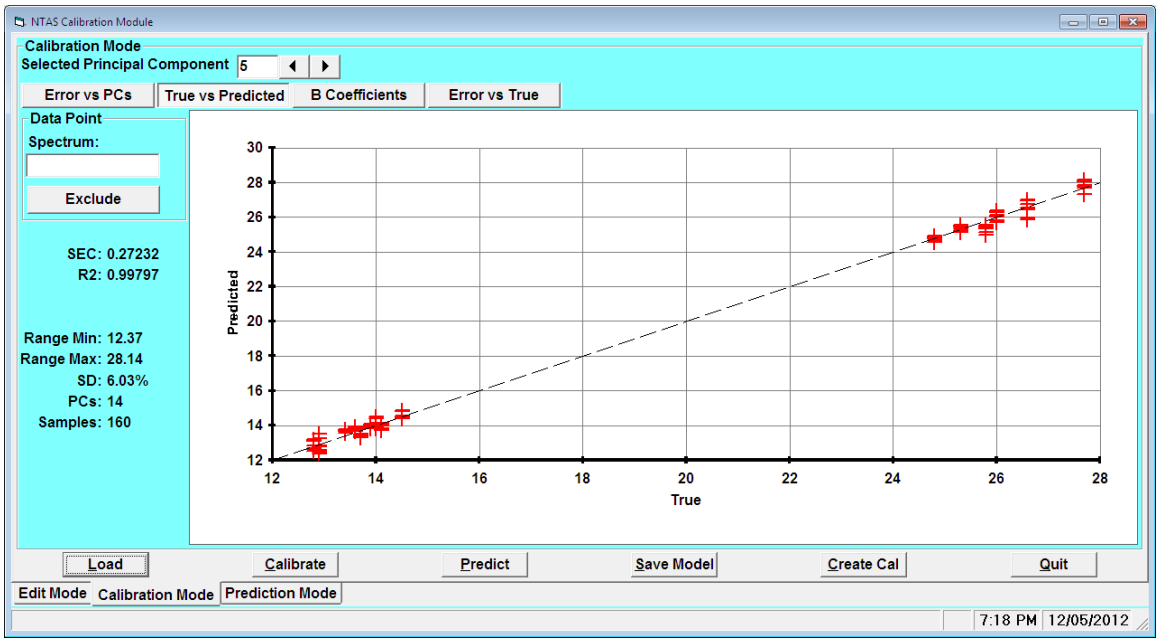

Figure 3. Fat Calibration Plot

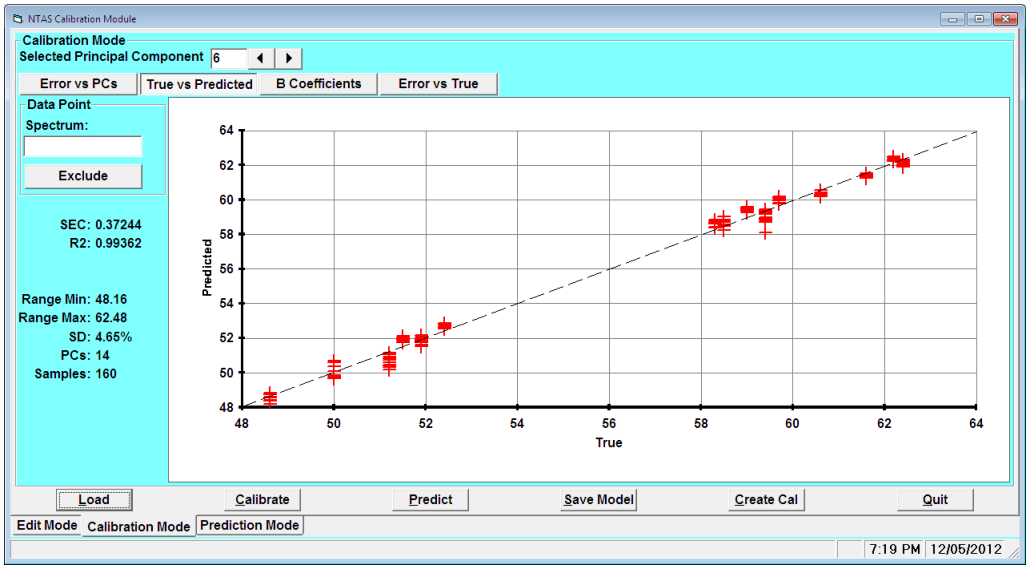

Figure 4. Moisture Calibration Plot

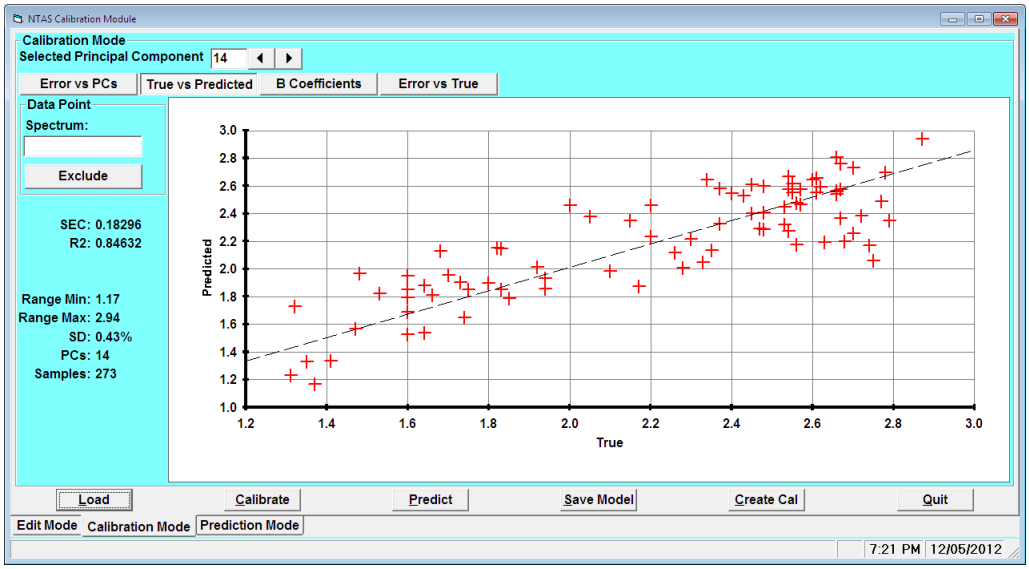

Figure 5. Salt Calibration

The Standard Error of Calibration (SEC) and correlation (R^2) for these components in Feta Cheese were calculated to be:

	SEC	R^2
Fat	0.27%	.97
Moisture	0.10%	.99
TS	0.47%	.84

Conclusion:

The Series 2000 Near Infrared Transmission Analyser has been shown to provide very accurate and precise analyses of normal fat and reduced fat Feta Cheese.

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