

## Introduction:

Halloumi Cheese is a Cypriot semi-hard, unripened brined cheese made from a mixture of goats' and sheep milk, and sometimes also cows' milk. It has a high melting point and so can easily be fried or grilled. Halloumi is set with rennet and is unusual in that no acid or acid-producing bacterium is used in its preparation.

This study demonstrates the use of the Series 2000 NIT Analyser to measure halloumi cheese quickly and accurately.

## Procedure:

NIT spectral data that had been used to develop calibrations for cheddar cheese slices was used to develop calibrations for halloumi cheese. Although cheddar and halloumi are different products, the concentrations of fat, protein and moisture are similar and their NIT spectra are similar. Figure 2 shows the spectra of halloumi cheese and cheddar cheese slices.



Once calibrations had been downloaded into the Series 2000 NIT Analyser, 70 grams of 8 samples of halloumi were ground to a crumb using a food processor and then weighed into a 10mm pathlength Squeeze Cell (figure 1). 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.

Each sample of ground halloumi was analysed using the calibrations developed and downloaded into the Series 2000 NIT Analyser. 10 scans were collected for each sample and averaged to measure fat, moisture and salt. Each sample was repacked and analysed twice.

## Results:

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

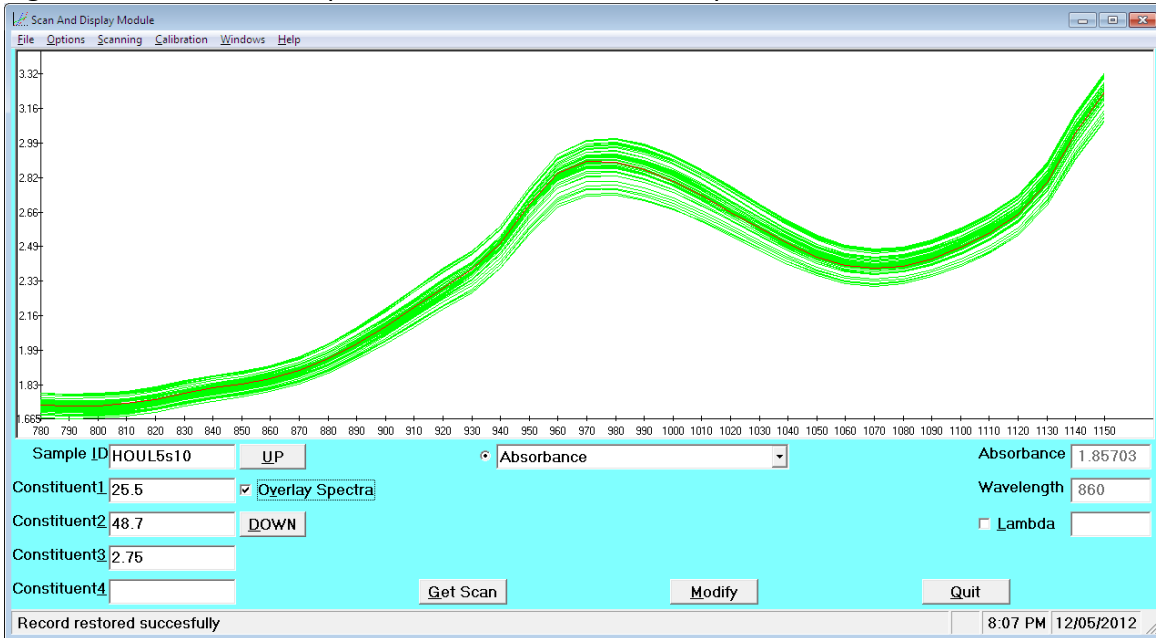


Figure 2.

Figures 3 and 4 show the plots for prediction of fat and moisture.

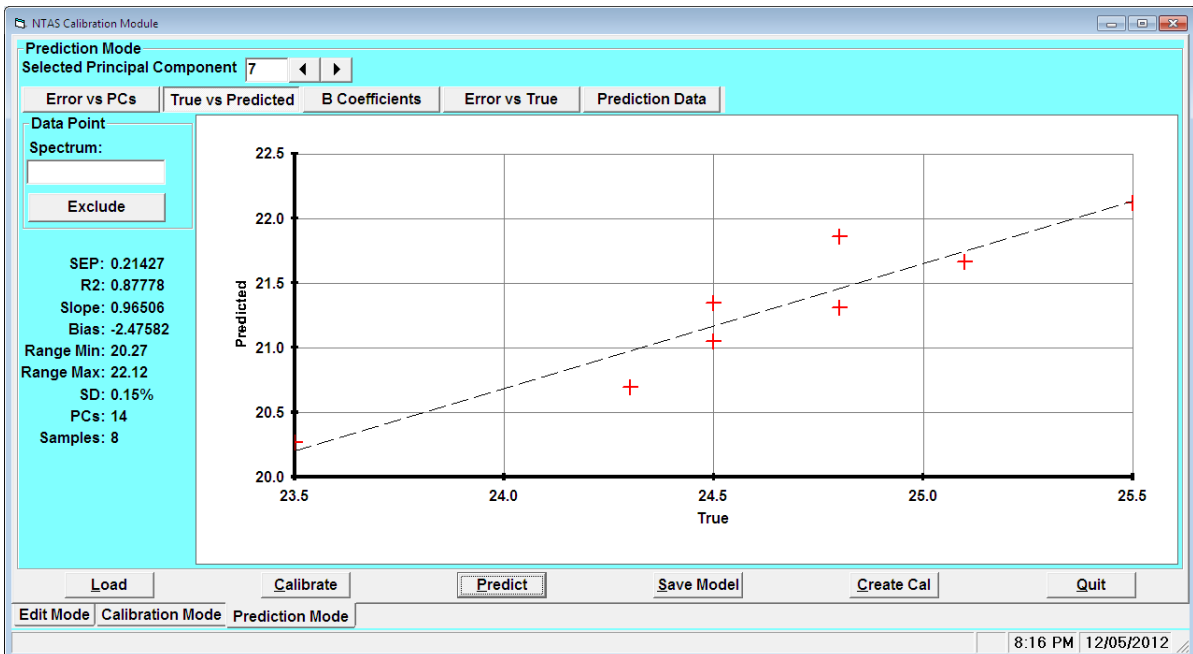


Figure 3. Fat Calibration Plot

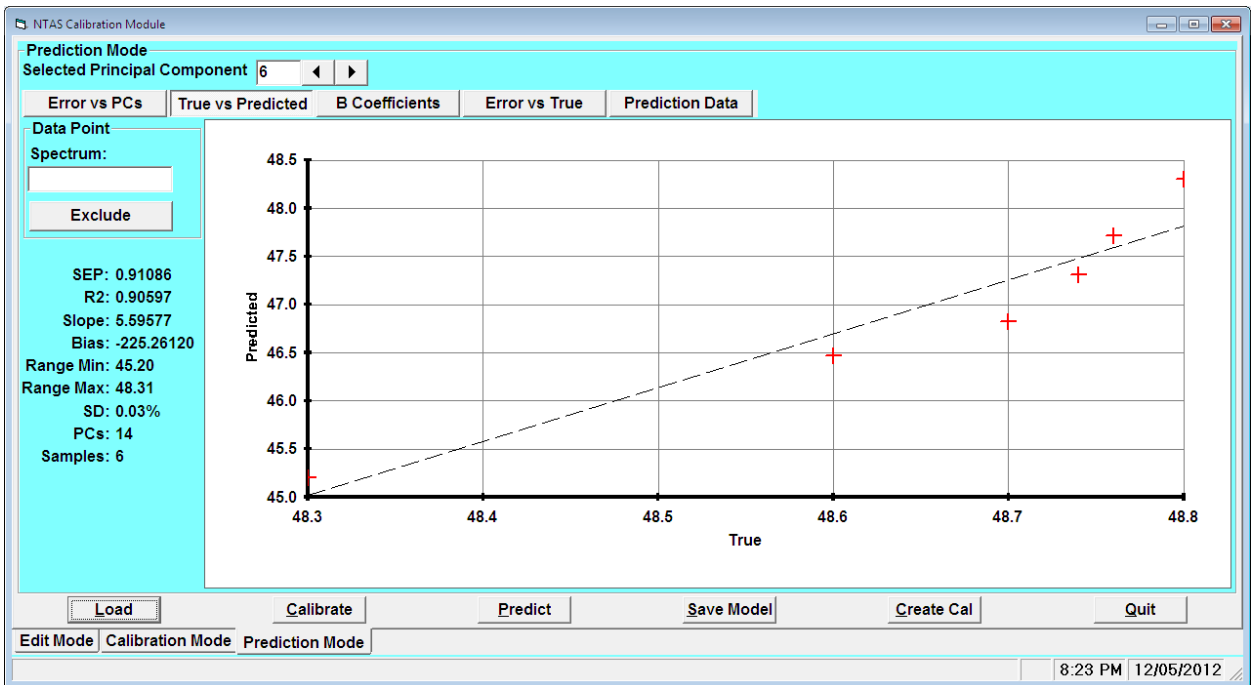


Figure 4. Moisture Prediction Plot

The Standard Error of Calibration (SEC) for these components in Feta Cheese were calculated to be:

	SEP
Fat	0.21%
Moisture	0.90%

### Conclusion:

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