

Introduction:

Whole milk contains approximately 3-4% fat. To make various cheese products, cream is blended with whole milk to raise the fat content to the required fat level, ie, 9-15% depending on the product. Controlling the fat level in this blend is very important to cheese manufacturers.

This application note reports data collected using a FOP-38 On Line NIT Analyser installed in pipe through which pasteurised high fat milk is pumped prior to homogenisation and then culturing.

Description:

A stainless steel flow cell with two hardened fused quartz glass windows, 10mm pathlength, was installed into a 2" pipe between a pasteuriser and a homogeniser. A tungsten halogen lamp was installed into a Swaglock fitting on one side of the flow cell and fibre optic cable into the other side. NIR light passes through the windows and is collected by the fibre optic cable and transmitted back to the NIR spectrometer. High fat milk is pumped through the pipe and the Near Infrared Transmission spectra were collected using the FOP-38 On Line Fibre Optic Probe Analyser. Samples of the milk were collected at the same time as the NIT spectra. These samples were analysed for Fat and Protein using a Foss Milkoscan FTS120.

The Milkoscan results were added to the NIT spectral files and calibrations were developed for fat and protein. These calibrations were downloaded into the FOP-38 and prediction data was over the next two days.

The data below shows the plot of the calibration data and the FOP-38 prediction data vs the reference data from the Milkoscan.

Calibration Data:

Figure 1 shows the calibration plot of NIR Fat vs Ref Fat.

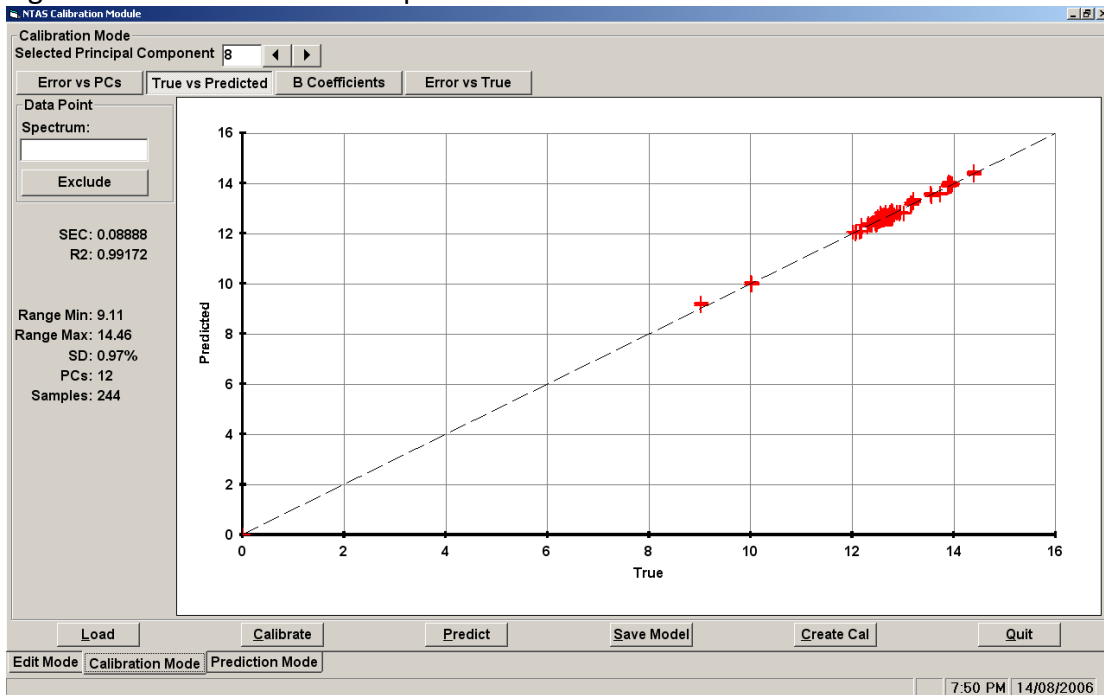
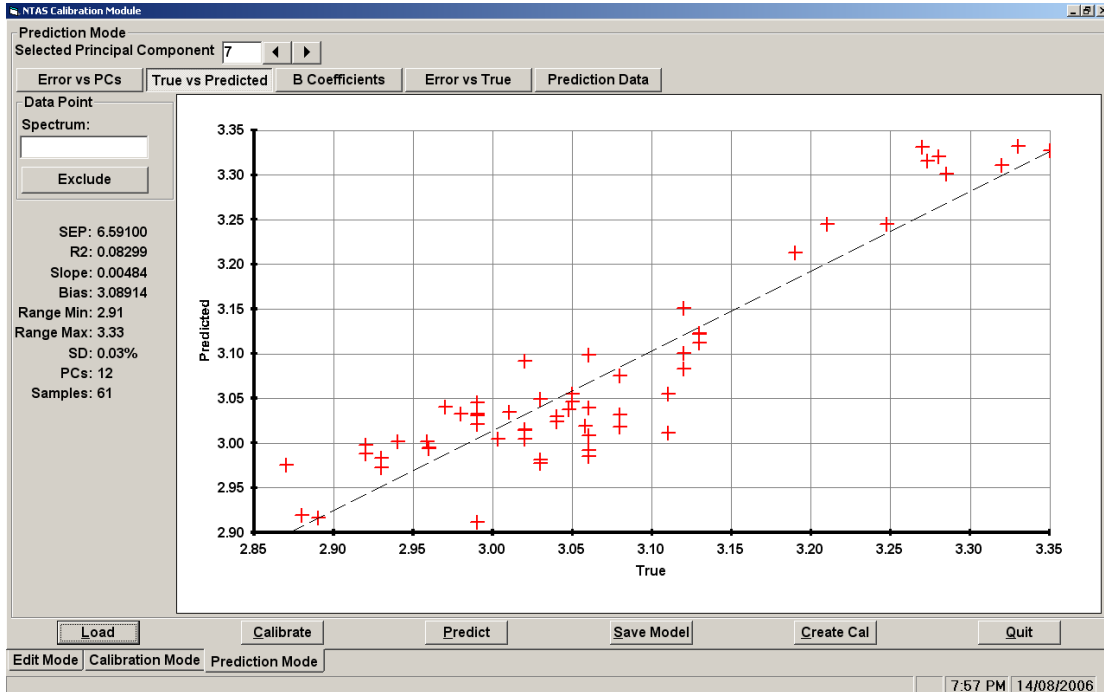


Figure 2. shows the calibration plot of NIR Protein vs Ref Protein



Prediction Data:

Figure 3. shows the prediction plot of NIR Fat vs Ref Fat.

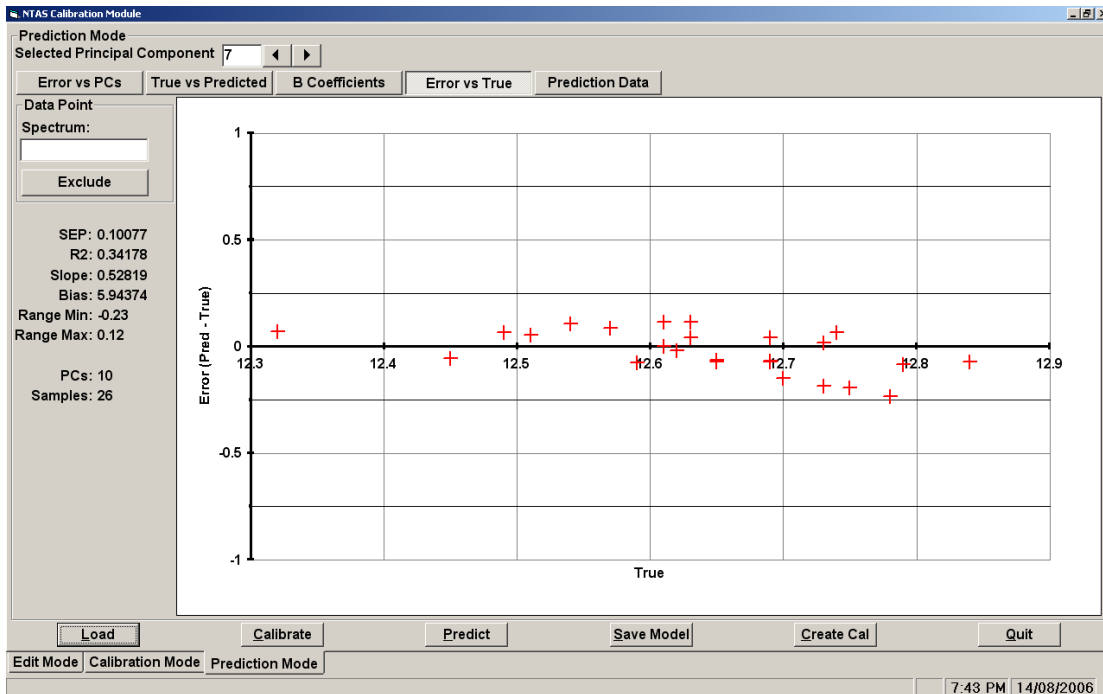


Figure 4. shows the prediction plot for NIR Protein vs Ref Protein

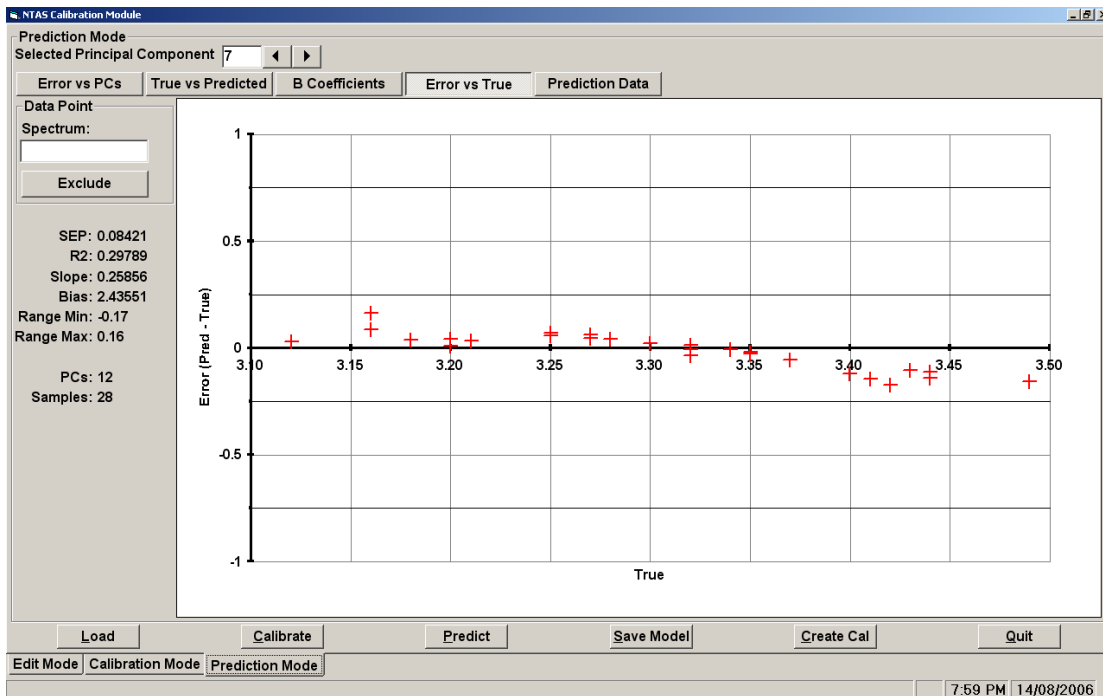
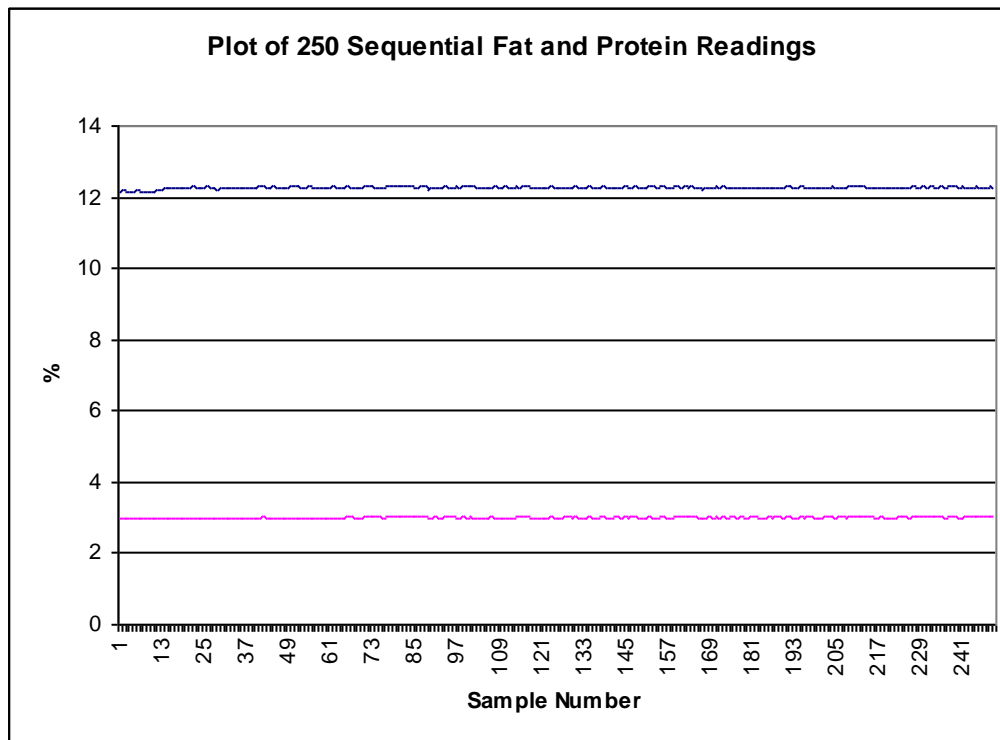


Figure 5. Prediction data for Protein



Conclusion:

Based on the data above, it is our conclusion that the FOP-38 On Line Analyser is suitable for monitoring the fat content of the high fat milk. Considering the stability of the analyser, it should provide an excellent means for implementing a feedback control of the proportioning valves used to control the Standardisation Process.