

Technical Note 25: Invalid Adding Temperature Stabilisation Samples to a Milk Calibration



Introduction

The most reliable method of correcting for temperature effects is to add a set of spectra to the calibration file that were collected under low and high temperatures. The procedure to stabilise a calibration is as follows;

1. Collect 500 mls of 5 samples of milk with as wide a range of fat and SNF values as possible. Divide each 500ml sample into 3 x 170ml(approx) containers with sealed lids.
2. Place 1 container of each sample into the following for 30 minutes:
 - 10C Refrigerator – Cold Samples
 - 45C Water Bath – Hot Samples
 - 25C or whatever temperature you will analyse samples routinely. - Room Temp Samples.
3. Remove the Cold Samples 1 at a time and analyse then on the NIT-38 Dairy Analyser. Save the scans using the following name: "SampleID"-10C. Note that the "SampleID" is the number or code for each sample.
4. Remove the Hot Samples 1 at a time and analyse them on the NIT-38 Dairy Analyser Save the scans with the following name: "SampleID"-45C.
5. Analyse the Room Temp Samples on the NIT-38 Dairy Analyser and save the scans with the following name: "SampleID"-RT.
6. Place the NIT-38 Dairy analyser into a refrigerator for 60 minutes. Remove from the refrigerator and turn on. Leave for 5 minutes and then analyse the 5 Room Temp Samples. Save the scans with the following name: "SampleID"-IN10.
7. Place the instrument into a hot area, ie direct sun light, for 60 minutes. Return the instrument to the laboratory and turn on for 5 minutes. Analyse the 5 Room Temp Samples and save the scans using the following name: "Sample ID"-IN40.
8. Upload all the scans and save in a PC. Submit the 5 Room Temp Samples for reference testing for fat and SNF. Repeat the reference tests. Email the scans, ie Results.csv file, and the duplicate reference values for each sample to nirtech@nirtech.net.

- Scan each sample at room temperature when the instrument has been left on to reach the optimum temperature range, eg 25-35C.

- Place the instrument into a cold room or refrigerator for 2 hours. Remove the instrument and turn on. When the instrument reaches 10C, scan the 5 samples again and save the spectral data.

- Place the instrument into a hot chamber set at 45C for 2 hours. Remove the instrument and turn on. Scan the five samples again and store the spectral data.
- Place the samples into the refrigerator or cold room for 2 hours. Remove and scan the five samples in the instrument which should be at normal operating temperature. Save the spectral data.
- Place the samples in a hot chamber set at 45C for 2 hours. Remove and scan as before.

Upload the 25 sets of spectra and add them to the calibration file and recalibrate. By including samples with high and low temperature variations, for both the samples and instrument, then it trains the calibration to be less sensitive to temperature effects.

Note that this procedure is required for every calibration set.