

Analysis of Ice Cream Mix for Fat and Total Solids Content

Introduction

Accurate control of butterfat and total solids in ice cream mix affects both quality and profitability. Butterfat is a costly ingredient therefore drives profitability. The combination of butterfat and total solids affects texture thereby impacting quality and mouth-feel. Using the DA 7250, staff can perform their own analysis 24/7 and have instant access to the results.

The Near Infrared Reflectance (NIR) technique is particularly suited for measurement of ice cream mix, but limitations of other instruments with older technology have not allowed users to reap the full benefits of NIR. The DA 7250 does not require samples to be homogenized as they are analyzed in open faced, disposable cups – also eliminating time consuming error-prone, clean-up steps.



DA 7250 NIR Food Analyzer

The DA 7250 is a full-spectrum, NIR instrument designed for use in food processing industries. It is IP65 certified and can be placed in production areas. Samples are analyzed in only 6 seconds with no sample preparation required. During this time, a large number of spectra are collected and averaged. Since the sample is analyzed in a disposable cup, the problems associated with glass cells are avoided and operator influence on results is minimized.



Data Collection

Approximately 80 samples of ice cream mix from a US processing plant served as the calibration set. The spectral data was collected using a DA 7250. The reference chemistry was supplied by the customers and was conducted following the Mojonnier method for Fat and an oven for Total Solids content. Calibrations were developed using Partial Least Squares (PLS) regression. A Perten proprietary harmonization method was applied as a pre-treatment to the spectra.

Results and discussion

The DA 7250 results are very accurate when compared to the results from the reference methods. Statistics for the respective parameters are presented in the table below and graphs are displayed on page 2.

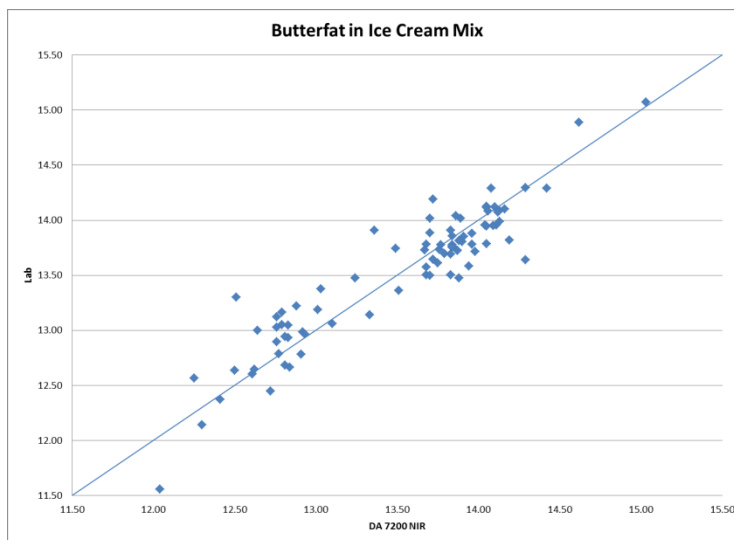
Parameter	Range	Samples	R
Butterfat	12.04 -15.03%	80+	0.930
Total Solids	40.65 -45.21%	80+	0.862

The differences between the DA 7250 and the reference methods are of the same magnitude as typical differences between two different reference labs. The DA 7250 is more precise than the reference methods, meaning that replicate analyses are generally more repeatable and representative.

In summary, it is concluded that the DA 7250 can accurately analyze ice cream mix for fat and solids content. The speed of analysis allows users to easily and accurately analyze many samples a day in nearly real time. The disposable cups remove the need for a homogenizer and laborious cleaning of cells. The instrument's ease of use and flexibility – it can also analyze cream, cheese, butter, dairy powders etc.– make it ideal for use at dairy plants worldwide.

Butterfat

Fat is accurately and readily measured across a wide range of values.



Total Solids

The speed and use of open faced disposable cups of the DA 7250 make TS measurements, fast, accurate, and repeatable.

