Analysis of Buttermilk for Fat and Total Solids Content Using the DA 7250 SD

Introduction

Whether cultured on its own or obtained as a by-product of butter production, buttermilk is an important dairy product. Using the DA 7250 SD, staff can perform their own analysis 24/7, as shipments are sent/received and have instant access to the results. The results can be used for process optimization and prevention of costly mistakes.

The Near Infrared Reflectance (NIR) technique is highly suitable for this purpose, but in the past instrument limitations have not permitted users to reap the full benefits of NIR. Sample preparation requirements, special cups or extensive clean up requirements made analyses laborious and time consuming.

DA 7250 SD

The DA 7250 SD is a proven NIR instrument designed for use in the food industry. Using novel diode array technology it performs a multi-component analysis in only 6 seconds with no sample preparation required. During this time a large number of full spectra are collected and averaged.

As the sample is analyzed in an open dish, the problems associated with sample cups are avoided and operator influence on results is minimal. Disposable cups can be used, eliminating the need for cleaning between samples.

Data Collection

Approximately 100 samples of buttermilk from two US processing plants served as the calibration set. The spectral data was collected using the Disposable Cup Module with 2 oz. disposable cups. Reference chemistry was supplied by the customers and was conducted following the Kohman method for Fat and an oven for Total Solids content.

Calibrations were developed using Partial Least Squares (PLS) regression.

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	Sample	R
Fat	0.37 – 1.28%	100+	0.944
Solids	7.86 – 9.89%	700+	0.860

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 buttermilk 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 laborious cleaning of cells. The instrument's ease of use and flexibility – it can also analyze cheese, butter etc.– make it ideal for use at dairy plants worldwide.

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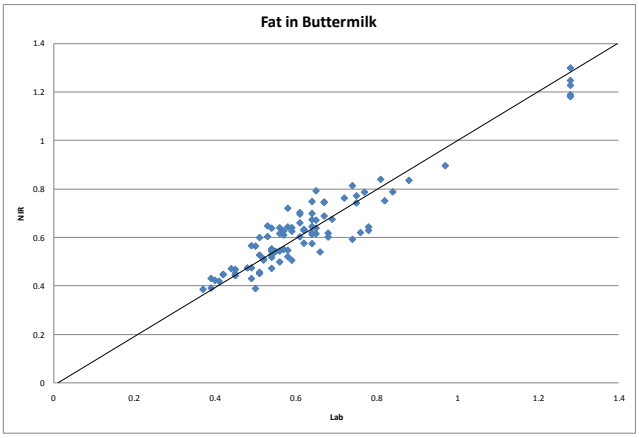
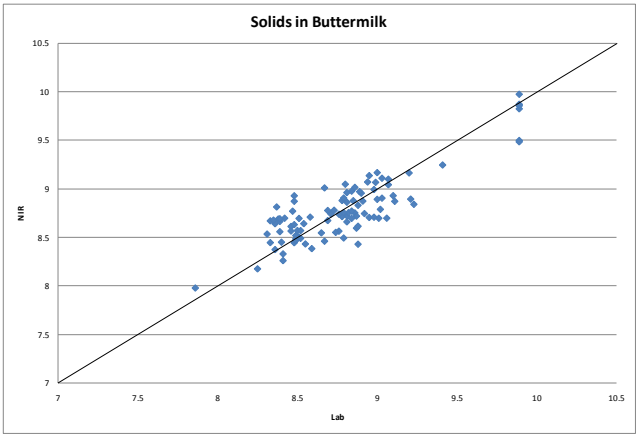
Fat

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



Total Solids

Solids in buttermilk is readily measured across a wide range.



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