Analysis of Evaporated Milk for Total Solids and Fat Using the DA 7250 SD

Introduction
Evaporated milk is an important ingredient for many products and an important form for long term storage of milk. The total solids and fat content are keys to proper performance as an ingredient and long term storage. Correct quantities impart both functional and flavor characteristics. In addition, accurate control of total solids and fat can optimize profitability of the processor. The DA 7250 allows staff to perform analyses 24/7 and have instant access to results. The results can be used for process optimization and prevention of costly mistakes.

The Near Infrared Reflectance (NIR) technique is particularly suited to measurement of evaporated milk, but limitations of instruments using older technology did not allow users to reap the full benefits of NIR. Sample presentation requirements such as significant dilution and use of glass sample cells that had to be filled properly and were difficult to clean made analyses laborious, time consuming and error-prone.

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 petri dishes can be used, eliminating the need for cleaning between samples. The stainless steel sanitary design of the instrument makes it hygienic and easy to clean.

Data Collection
More than 100 samples of evaporated milk served as the calibration set. The spectral data was collected using a DA 7250 equipped with the Disposable Cup Module using 2 oz. disposable cups. The reference chemistry was supplied by the customer.

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	Samples	R
Total solids	23.00 – 25.06	100+	0.95
Fat	6.02 – 8.26	100+	0,97

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 Diode Array 7250 can accurately analyze evaporated milk for total solids and fat 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 dilution and laborious cleaning of cells. The instrument's ease of use and flexibility – it can also analyze powders, cream, cheese, butter etc. – make it ideal for use at dairy plants worldwide.

Total Solids

Total Solids is readily measured with the DA 7250.

Total Solids of Evaporated Milk
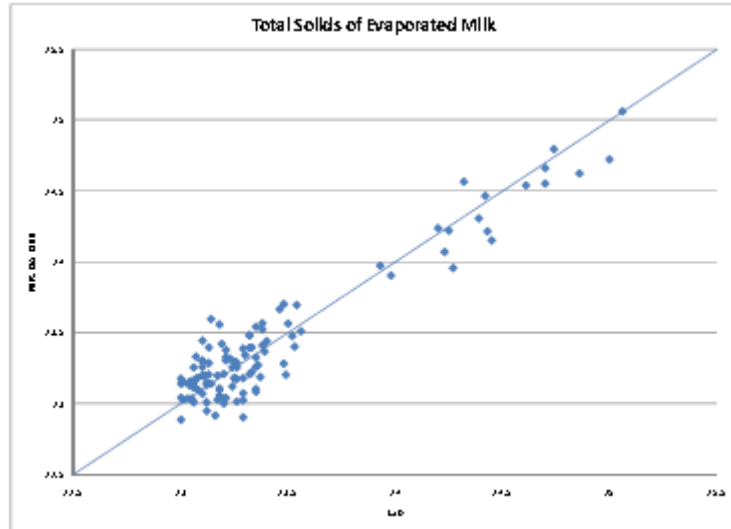
Fat

Fat is accurately measured across a wide range of values.

Fat in Evaporated Milk

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