

### Analysis of Cream for Fat Content Using the DA 7250 SD

#### Introduction

Cream is an important dairy product due to its use as a precursor and ingredient in many finished foods. Fat and Total Solids content are extremely important measurements that dictate use, processing conditions, and payment terms. By accurately controlling the fat content, the creamery can experience significant savings by optimizing production to meet specifications. Using the DA 7250, 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 to avoid costly mistakes such as placing in the wrong tank.

The Near Infrared Reflectance (NIR) technique is particularly suited for measurement of cream, but past instrument limitations have not allowed users to reap the full benefits of NIR. Sample presentation requirements such as glass samples 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.



#### Experimental

More than 700 samples of cream were analyzed in a DA 7250 equipped with the Disposable Cup Module. The reference chemistry was supplied by the customers and was conducted following the Gerber method using a cream butyrometer (+/- 0.5% per manufacturer).



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
Fat	55-510	700+	0.99

The differences between the DA 7250 and the reference method 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 analyze cream for the aforementioned constituents. The speed 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 ease-of-use and flexibility – it can analyze cheese, butter etc. as well – make it ideal for use at dairy plants worldwide.

## Fat

Fat is accurately and readily measured across a wide range of values. Fat affects the value of cream and is therefore an important measurement.

