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Milk and liquid milk products — Guidelines for the application of mid- infrared spectrometry

*Lait et produits laitiers liquides — Lignes directrices pour
l'application de la spectrométrie dans le moyen infrarouge*



Reference numbers

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Documents

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

This second edition of joint ISO 9622|IDF 141 cancels and replaces the first edition (ISO 9622:1999), which has been technically revised.

Foreword

IDF (the International Dairy Federation) is a non-profit organization representing the dairy sector worldwide. IDF membership comprises National Committees in every member country as well as regional dairy associations having signed a formal agreement on cooperation with IDF. All members of IDF have the right to be represented on the IDF Standing Committees carrying out the technical work. IDF collaborates with ISO in the development of standard methods of analysis and sampling for milk and milk products.

The main task of Standing Committees is to prepare International Standards. Draft International Standards adopted by the Standing Committees are circulated to the National Committees for endorsement prior to publication as an International Standard. Publication as an International Standard requires approval by at least 50 % of IDF National Committees casting a vote.

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ISO 9622|IDF 141 was prepared by the International Dairy Federation (IDF) and Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*. It is being published jointly by IDF and ISO.

All work was carried out by an ISO-IDF Project Group on Guidance on the application of mid-infrared spectrometry, of the Standing Committee on *Statistics and Automation (SCSA)*, under the aegis of its project leaders, Mr. P. Sauvé (CA) and Mr. H. van den Bijgaart (NL).

This second edition of joint ISO 9622|IDF 141 cancels and replaces IDF 141C:2000, which has been technically revised.

Milk and liquid milk products — Guidelines for the application of mid-infrared spectrometry

1 Scope

This International Standard gives guidelines for the quantitative compositional analysis of milk and liquid milk products, such as raw milk, processed milk, cream and whey, by measurement of the absorption of mid-infrared radiation.

Additional built-in instrument features, such as a conductivity sensor, can improve the performance in the determination of compositional parameters and allow for the estimation of other parameters.

The guidelines specified are applicable to the analysis of cow's milk. The guidelines are also applicable to the analysis of milk of other species (goat, ewe, buffalo, etc.) and derived liquid milk products, provided adequate calibrations are generated for each application and adequate control procedures are in place.

The application is limited to lower viscosity products that can be pumped through the flow system of the analyser and to analytes that do not result in optical saturation at the specific wavelengths being utilized.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable to its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8196|IDF 128 (all parts), *Milk — Definition and evaluation of the overall accuracy of indirect methods of milk analysis*

ISO 8968-1|IDF 20-1, *Milk — Determination of nitrogen content — Part 1: Kjeldahl method*

ISO 8968-2|IDF 20-2, *Milk — Determination of nitrogen content — Part 2: Block-digestion method (Macro method)*

ISO 8968-5|IDF 20-5, *Milk — Determination of nitrogen content — Part 5: Determination of protein-nitrogen content*

NOTE Other normative documents can apply depending on the specific application or calibration of the automated analyser.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8196|IDF 128 (all parts), and the following apply.

3.1

spectral calibration

spectrum calibration model

calibration based on combination of absorbance signals at several (>2) wavelengths in the mid-infrared region or signals from other sensors, mathematically optimized to arrive at the best estimate for the parameter of interest

3.2

slope and intercept calibration

simple linear regression coefficients as established from a least-squares regression of optimized instrument readings against results as obtained with physico-chemical reference methods