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Milk and milk products — Guidelines for the application of in-line and on-line infrared spectrometry

Lait et produits laitiers — Lignes directrices pour l'application de la spectrométrie infrarouge en ligne

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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 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee 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.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

IDF (the International Dairy Federation) is a non-profit private sector organization representing the interests of various stakeholders in dairying at the global level. IDF members are organized in National Committees, which are national associations composed of representatives of dairy-related national interest groups including dairy farmers, dairy processing industry, dairy suppliers, academics and governments/food control authorities.

ISO and IDF collaborate closely on all matters of standardization relating to methods of analysis and sampling for milk and milk products. Since 2001, ISO and IDF jointly publish their International Standards using the logos and reference numbers of both organizations.

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This document was prepared by the IDF *Standing Committee on Statistics and Automation* and ISO Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*. It is being published jointly by ISO and IDF.

The work was carried out by the IDF/ISO Action Team (S12) of the *Standing Committee on Statistics and Automation* under the aegis of its project leaders, Dr S. Holroyd (NZ) and Dr A. Larsen (DK).

Milk and milk products — Guidelines for the application of in-line and on-line infrared spectrometry

1 Scope

This document gives guidelines for using infrared spectrometry in in-line and on-line applications for dairy processing. These applications are distinct to those covered in ISO 21543 | IDF 201.

It is applicable, but not limited, to:

— the determination of protein, fat and total solids in liquid milk and milk products using mid and near infrared spectrometry;

— the determination of protein, fat and moisture in solid or semi-solid products, such as milk powder, and butter and liquid dairy streams using near infrared spectrometry.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
in-line analysis
analysis of a product line where the sensor probe interfaces directly with the product stream being measured, or a reflectance measurement through an optical window into the product stream

3.2
on-line analysis
analysis of a product line where the sensor probe interfaces indirectly with the product stream being measured by way of a bleed loop, automated grab sampler or other means of subsampling

3.3
at-line analysis
analysis of a product where the instrument is physically remote to the product stream being measured and the sample is manually introduced to the instrument

Note 1 to entry: While not covered in this document, this definition is added here in order to distinguish this type of spectometric analysis from in- and on-line apparatus.

3.4
near infrared instrument
NIR instrument
proprietary apparatus utilizing wavelengths within the range 400 nm to 2 500 nm or 25 000 cm^{-1} to 4 000 cm^{-1} (both visible and NIR range) or 12 820 cm^{-1} to 4 000 cm^{-1} (NIR range only) which, when used under certain conditions, estimates mass fractions or other parameters of use