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Milk and milk products — Determination of fat content — General guidance on the use of butyrometric methods

ICS 67.100.10

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National foreword

This British Standard is the UK implementation of ISO 11870:2009. It supersedes BS ISO 11870:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee AW/5, Chemical analysis of milk and milk products.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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Milk and milk products — Determination of fat content — General guidance on the use of butyrometric methods

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 11870|IDF 152 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.

This second edition of ISO 11870|IDF 152 cancels and replaces the first edition (ISO 11870:2000), of which it constitutes a minor revision.

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 Action Teams and Standing Committees are circulated to the National Committees for voting. Publication as an International Standard requires approval by at least 50 % of the IDF National Committees casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. IDF shall not be held responsible for identifying any or all such patent rights.

ISO 11870|IDF 152 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 the former Joint ISO-IDF Group of Experts (E301 — *Fat*) which is now part of the Joint ISO-IDF Action Team on *Fat* of the Standing Committee on *Main components in milk*.

This edition of ISO 11870|IDF 152 cancels and replaces IDF 152A:1997, of which it constitutes a minor revision.

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Introduction

Reference methods for the determination of fat in milk and milk products are time-consuming to apply and require some experience if reliable results are to be obtained.

Butyrometric techniques, which are simpler to apply, make it possible to obtain fat contents for various milk products quickly. This is why they are used in a great number of industrial laboratories as a fast method for routine checks.

Two acid-butyrometric methods used in many countries to determine the fat content of milk (Gerber method) and of cheese (Van Gulik method) are the subject of International Standards. The apparatus has also been standardized.

In addition, there are other butyrometric methods and butyrometers which have been described or applied in various countries for other types of products (cream, milk powder, etc.).

Whilst only one procedure exists as a reference method for a particular product type, this is not the case for butyrometric methods. Depending upon the country, different butyrometric methods may exist for one single type of product, presenting many problems for the harmonization of such procedures.

Another problem relates to the applicability of such methods. Indeed, with evolving manufacturing technologies, the variety of milk products is such that it is not possible to determine a method which can be applied to all varieties of a single type of product (milk, cheese, cream, etc.). Tests have confirmed this and have shown that the butyrometric methods already standardized have been attributed fields of application which are far too wide-ranging.

Thus this general guide has been prepared to be used in conjunction with existing International Standards.

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1 Scope

This International Standard gives guidance on:

- a) existing standardized methods (both reference and butyrometric) for the determination of fat in various milk products;
- b) the principles underlying any acid-butyrometric analysis and the main operating requirements;
- c) a validation procedure for a butyrometric method in relation to the relevant reference method.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2446|IDF 226:2008, *Milk — Determination of fat content*

ISO 3433|IDF 222, *Cheese — Determination of fat content — Van Gulik method*

3 Principle

The principles of any butyrometric method remain constant, independent of the product to be analysed. Protein is digested with sulfuric acid. The fat in the product is separated by centrifuging it in a butyrometer. The separation is enhanced by the addition of a small quantity of isoamyl alcohol. The butyrometer scale is then read directly with or without correction.

4 Methods for the determination of fat content

Methods for the determination of fat content are based upon acid-butyrometric and reference gravimetric methods.

The Gerber method is specified in ISO 2446|IDF 226 and the Van Gulik method in ISO 3433|IDF 222. Existing butyrometric and reference methods for most dairy products are listed in Table A.1.

5 Reagents

Use only reagents of recognized analytical grade, unless otherwise specified, and distilled water or demineralized water or water of equivalent purity.