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**Milk, dried milk products and
cream — Determination of fat content
— Gravimetric method**

*Lait, produits laitiers secs et crème — Détermination de la teneur en
matière grasse — Méthode gravimétrique*



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Contents

Page

Foreword.....	v
1 Scope.....	1
2 Normative references.....	2
3 Terms and definitions.....	2
4 Principle.....	2
5 Reagents.....	2
6 Apparatus.....	3
7 Sampling.....	4
8 Preparation of test sample.....	5
8.1 Milk.....	5
8.2 Dried milk products.....	5
8.3 Evaporated milk.....	5
8.4 Sweetened condensed milk.....	5
8.5 Whey cheese.....	6
8.6 Cream.....	6
8.7 Skimmed milk, whey and buttermilk.....	6
8.8 Milk-based infant foods.....	6
8.8.1 Liquid products.....	6
8.8.2 Viscous or pasty products.....	7
8.9 Milk-based edible ices and ice mixes.....	7
8.9.1 Edible ices, ice mixes and concentrated ice mixes.....	7
8.9.2 Dried ice mixes.....	7
9 Procedure.....	7
9.1 Test portion.....	7
9.2 Blank tests.....	8
9.3 Preparation of fat-collecting vessel.....	8
9.4 Determination.....	9
9.4.1 Preparation steps.....	9
9.4.2 Determination.....	10
10 Calculation and expression of results.....	13
10.1 Calculation.....	13
10.2 Expression of results.....	13
11 Precision.....	14
11.1 Interlaboratory test.....	14
11.2 Repeatability.....	14
11.3 Reproducibility.....	14
12 Test report.....	15
Annex A (informative) Additional procedures.....	16
Annex B (informative) Fat-extraction tube model with siphon or wash-bottle fittings.....	18
Annex C (informative) Interlaboratory study on raw milk.....	19
Annex D (informative) Interlaboratory study on raw sheep milk and raw goat milk.....	21
Annex E (informative) Interlaboratory study on dried milk products.....	22
Annex F (informative) Interlaboratory study on cream.....	23
Annex G (informative) Interlaboratory study on skimmed milk (specific method when high accuracy is required, see 9.1).....	24
Annex H (informative) Interlaboratory study on other dairy products.....	25

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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).

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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 Analytical Methods for Composition* 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 ISO/IDF Action Team on C32 of the *Standing Committee on Analytical Methods for Composition* under the aegis of its project leader, Mr P. Trossat (FR).

Milk, dried milk products and cream — Determination of fat content — Gravimetric method

WARNING — The use of this document may involve hazardous materials, operations and equipment. This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This document specifies the method for the determination of fat content.

The method is applicable to:

- a) raw milk (cow, sheep, goat), reduced fat milk, skimmed milk, chemically preserved milk and processed liquid milk;
- b) dried milk products (e.g. whole, partially skimmed, skimmed milk powder; dairy permeate powder; whey powder; blend skimmed milk powder and vegetable fat; milk based infant formula powder);
- c) raw, processed and sour cream.

For the following products, the precision figures are given in [Annex H](#). These precision figures are derived from interlaboratory studies not conforming to the requirements from ISO 5725-2 in terms of number of samples (< 6) and number of participating laboratories (< 8).

- d) evaporated milk and sweetened condensed milk (e.g. liquid sweetened and unsweetened concentrated milk);
- e) whey cheese as defined in CODEX CXS 284-1999;
- f) liquid whey and buttermilk;
- g) milk-based edible ices and ice mixes;
- h) liquid concentrated infant foods.

The method does not apply in the following cases:

- For b), when the powder contains hard lumps which do not dissolve in ammonia solution. This is noticeable by a distinct smell and the result of the determination will be too low. In such cases, a method using the Weibull-Berntrop principle is suitable, e.g. ISO 8262-3|IDF 124-3.
- For c), The method is not applicable to sour creams with starch or other thickening agents. When separation or breakdown of fat occurs, a method using the Weibull-Berntrop principle is suitable, e.g. ISO 8262-3|IDF 124-3.
- For e), to products which do not dissolve completely in ammonia solution, as the result of the determination will be too low. With such products, a method using the Weibull-Berntrop principle is suitable, e.g. ISO 8262-3|IDF 124-3.
- For g), to milk-based edible ices and ice mixes in which the level of emulsifier, stabilizer or thickening agent or of egg yolk or of fruits, or of combinations of these constituents, makes the Röse-Gottlieb method unsuitable. With such products, a method using the Weibull-Berntrop principle is suitable, e.g. ISO 8262-2|IDF 124-2.

- For h), to products which do not dissolve completely in ammonia due to the presence of starch or dextrin at mass fractions of more than 5 % (in dry matter), or to the presence of hard lumps. For such products, a method using the Weibull-Berntrop principle is suitable, e.g. ISO 8262-1|IDF 124-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 835, *Laboratory glassware — Graduated pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3889|IDF 219, *Milk and milk products — Specification of Mojonnier-type fat extraction flasks*

ISO 4788, *Laboratory glassware — Graduated measuring cylinders*

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

fat content

mass fraction of substances

Note 1 to entry: Fat content is determined by the procedure specified in this document.

Note 2 to entry: The fat content is expressed as a percentage by mass.

4 Principle

An ammoniacal ethanolic solution of a test portion is extracted with diethyl ether and light petroleum. The solvents are removed by distillation or evaporation. The mass of the substances extracted is determined.

NOTE This principle is usually described as the Röse-Gottlieb principle.

5 Reagents

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

The reagents shall leave no appreciable residue when the determination is carried out by the method specified (see [Annex A](#)).

5.1 Ammonia solution, containing a mass fraction of NH₃ of approximately 25 %.

If ammonia solution of this concentration is not available, a more concentrated solution of known concentration may be used (see [9.4.2.1](#)).