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**Butter — Determination of the refractive
index of the fat (Reference method)**

*Beurre — Détermination de l'indice de réfraction de la matière grasse
(Méthode de référence)*

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Foreword

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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 1739|IDF 7 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 edition of ISO 1739|IDF 7 cancels and replaces ISO 1739:1975, of which it constitutes a minor revision.

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Foreword

IDF (the International Dairy Federation) is a worldwide federation of the dairy sector with a National Committee in every member country. Every National Committee has 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.

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.

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ISO 1739|IDF 7 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.

This edition of ISO 1739|IDF 7 cancels and replaces IDF 7A:1969, of which it constitutes a minor revision.

All work was carried out by the former Joint ISO/IDF/AOAC Group of Experts on *Fat* (E40-E301).

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Butter — Determination of the refractive index of the fat (Reference method)

1 Scope

This International Standard specifies a reference method for the determination of the refractive index of the fat obtained by melting butter.

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 1740, *Milkfat products and butter — Determination of fat acidity (Reference method)*

3 Terms and definitions

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

3.1

refractive index of the fat from butter

ratio, at 40 °C, of the velocity of light of a defined wavelength (the mean of D-lines of sodium) in air to its velocity in the fat

NOTE In theory, there are two D-lines of sodium and the ratio should be referred to the velocity of light in vacuum, not in air. In practice, sodium light may be considered monochromatic, and the ratio related to that in air.

4 Principle

The refractive index of the fat obtained by melting butter is measured by means of a suitable refractometer.

5 Apparatus

5.1 Refractometer, with a scale graduated in refractive index units to the third decimal place, and having prisms heated by means of a circulating liquid at 40 °C, the temperature being thermostatically controlled to within $\pm 0,1$ °C.

5.2 Light source, sodium vapour lamp.

White light may also be used if the refractometer is fitted with an achromatic compensating device.

6 Sampling

A representative sample should have been sent to the laboratory. It should not have been damaged or changed during transport or storage.

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 707 | IDF 50.

7 Procedure

7.1 Preparation of test sample

To separate the fat, melt the sample and allow it to stand for 2 h to 3 h at 50 °C to 60 °C. Then decant and filter it through a dry filter paper. Filter again if the filtrate obtained is not clear. Use the melted and clarified fat, well mixed and free from water.

7.2 Determination

Prepare the refractometer and calibrate it by following the maker's instructions for using the instrument. Adjust the temperature of the circulating liquid to $(40 \pm 0,1)$ °C.

Place a few drops of fat (prepared as described in 7.1) between the prisms of the refractometer in such a way that the space between the prisms is completely filled. Wait for a few minutes to allow the fat to assume the temperature of the prisms.

Take the reading, estimating to tenths of a scale division (i.e. the fourth decimal place).

Carry out two determinations on the same prepared sample.

8 Expression of results

8.1 Correction

Correct the observed refractive index by adding 0,000 045 for each unit of the acid value if the latter, when determined by the method specified in ISO 1740, is equal to or greater than 2.

8.2 Method of calculation

Take as the result the arithmetic mean of the two results, corrected if necessary, if the requirement concerning repeatability (see Clause 9) is satisfied. Round the result to the fourth decimal place.

9 Repeatability

The difference between the results of two determinations carried out in rapid succession by the same analyst should not exceed 0,000 2.

10 Test report

The test report shall specify:

- a) all information necessary for the complete identification of the sample;
- b) the sampling method used, if known;
- c) the test method used, with reference to this International Standard;
- d) all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents which may have influenced the test result(s);
- e) the test result(s) obtained or, if the repeatability has been checked, the final quoted result obtained.

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Bibliography

- [1] ISO 707|IDF 50, *Milk and milk products — Guidance on sampling*

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