
International Standard



5534

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Cheese and processed cheese — Determination of total solids content (Reference method)

Fromages et fromages fondus — Détermination de la matière sèche (Méthode de référence)

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5534 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

NOTE — The method specified in this International Standard has been developed jointly with the International Dairy Federation (IDF) and the Association of Official Analytical Chemists (AOAC) and will also be published by these organizations.

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Cheese and processed cheese — Determination of total solids content (Reference method)

1 Scope and field of application

This International Standard specifies the reference method for the determination of the total solids content of cheese and processed cheese. It may not be applicable to process cheese preparations as defined in FAO/WHO Codex Alimentarius Commission, Milk and milk products standards, No. A-8 (c).

2 References

ISO 707, *Milk and milk products — Methods of sampling*.

FAO/WHO Codex Alimentarius Commission, Milk and milk products standards, No. A-8 (c) (1970). *General standard for process(ed) cheese preparations*.

3 Definition

total solids content: The mass remaining after completion of the heating process specified in this International Standard.

The total solids content is usually reported as a mass fraction, and is then conventionally expressed as a percentage by mass.

4 Principle

Evaporation of the water from a test portion in the presence of sand at a temperature of 102 ± 2 °C in a drying oven.

5 Apparatus and materials

The water used shall be distilled water or water of at least equivalent purity.

Usual laboratory apparatus, and in particular

5.1 Analytical balance.

5.2 Desiccator, provided with an efficient desiccant (for example freshly dried silica gel with a hygrometric indicator).

5.3 Drying oven, ventilated, capable of being maintained thermostatically at 102 ± 2 °C throughout the total working space.

5.4 Flat-bottom dishes, of height 20 to 25 mm, diameter 50 to 75 mm, and of appropriate material (for example stainless steel, nickel or aluminium), provided with well-fitting, readily removable lids.

5.5 Short glass stirring rods, flattened at one end and fitting into the dish (5.4).

5.6 Quartz sand or sea sand, which passes through a woven wire cloth sieve of nominal aperture size 500 µm, but is retained by a sieve of nominal aperture size 180 µm, and which passes the following suitability test.

5.6.1 Place approximately 20 g of sand in a dish containing a stirring rod. Heat the open dish and sand, stirring rod and lid in the oven (5.3) for at least 2 h. Fit the lid, allow the dish to cool in the desiccator (5.2) to the temperature of the balance room and weigh to the nearest 0,1 mg.

5.6.2 Moisten the sand with approximately 5 ml of water, mix the sand and water using the stirring rod, and heat the dish and sand, stirring rod and lid in the oven (5.3), for at least 4 h. Fit the lid, allow the dish to cool in the desiccator (5.2) to the temperature of the balance room and weigh again to the nearest 0,1 mg.

The difference between the two weighings shall not exceed 0,5 mg.

NOTE — If this requirement is not met, the sand can be made suitable for the determination as follows.

Leave the sand immersed in 25 % (*m/m*) hydrochloric acid for 3 days. Stir occasionally. Decant the supernatant liquid as far as possible. Then wash the sand with water until the acid reaction has disappeared.

Heat the sand at approximately 160 °C for at least 4 h. Then repeat the test for the suitability of the sand as described.

5.7 Appropriate devices for grating, grinding or mixing the sample.

6 Sampling

See ISO 707.

7 Preparation of the test sample

Unless specified otherwise, remove prior to the analysis the rind, smear or mouldy surface layer of the cheese in such a way as to provide a sample representative of the cheese as it is usually consumed. Grind or grate the sample by means of an appropriate device (5.7); mix the ground mass quickly, and, if necessary for semi-hard and hard cheeses, grind a second time and again mix thoroughly. Clean the device after grinding each

sample. If the sample cannot be ground or grated, mix it thoroughly by intensive kneading. These operations shall be completed as quickly as possible to avoid loss of moisture.

Transfer the test sample to an airtight container until the time of analysis, which shall be carried out as soon as possible after grinding. If delay is unavoidable, take every precaution to ensure proper preservation of the sample and to prevent condensation of moisture on the inside surface of the container.

Ground cheese showing unwanted mould growth or beginning to deteriorate shall not be examined.

8 Procedure

8.1 Preparation of the dish

Heat a dish (5.4) containing approximately 25 g of sand (5.6) with its lid alongside and a stirring rod (5.5) on top of the lid, in the oven (5.3) for 2 h.

Place the lid (with the stirring rod on top) on the dish, immediately transfer to the desiccator (5.2), allow to cool to room temperature (at least 45 min), and weigh the dish, with lid and rod, to the nearest 0,1 mg.

8.2 Test portion

Tilt the sand to one side of the prepared dish (8.1) place on the clear space about 3,0 g of the prepared test sample, replace the lid with the stirring rod on top and weigh the dish to the nearest 0,1 mg.

8.3 Determination

8.3.1 Thoroughly mix together the test portion and the sand, and spread the mixture evenly over the bottom of the dish. Leave the stirring end of the rod in the mixture with the other end resting on the rim of the dish.

NOTES

1 Mixing of sand and hard cheese may be facilitated by adding sufficient water (approximately 3 ml) to saturate the sand.

2 With cheeses which melt to a horn-like mass at a temperature of 102 ± 2 °C, it is recommended that the dish containing the crushed cheese first be heated on a water-bath or steam-bath, directly exposing the maximum surface area of the bottom of the dish to steam. The contents of the dish should be thoroughly mixed with the glass rod from time to time to prevent the formation of a hardened surface layer.

8.3.2 Lay the stirring rod flat inside the dish and heat the dish with its lid alongside, in the oven (5.3) for 3 h. Place the lid on the dish and immediately transfer to the desiccator (5.2).

8.3.3 Allow the dish to cool to room temperature (at least 45 min) and weigh to the nearest 0,1 mg.

8.3.4 Again heat the dish, with its lid alongside, in the oven, but for only 1,5 h. Place the lid on the dish and immediately transfer to the desiccator.

Allow to cool as in 8.3.3 and weigh to the nearest 0,1 mg.

8.3.5 Repeat the operations described in 8.3.4 until the difference in mass between two consecutive weighings does not exceed 0,5 mg. Record the lowest mass.

9 Expression of results

9.1 Method of calculation and formula

The total solids content, expressed as a percentage by mass, is equal to

$$\frac{m_2 - m_0}{m_1 - m_0} \times 100$$

where

m_0 is the mass, in grams, of the dish (including sand), lid and stirring rod (see 8.1);

m_1 is the mass, in grams, of the dish (including sand), lid, stirring rod and test portion (see 8.2);

m_2 is the mass, in grams, of the dish (including sand), lid, stirring rod and dried test portion (see 8.3.5).

Round the value obtained to the nearest 0,01 (m/m).

9.2 Precision

NOTE — These values are tentative, pending the result of a collaborative study.

9.2.1 Repeatability

The difference between two single results found on identical test material by one analyst using the same apparatus within a short time interval shall not exceed 0,10 g of total solids per 100 g of product on average more than once in 20 cases in the normal and correct operation of the method.

9.2.2 Reproducibility

The difference between two single and independent results found by two operators working in different laboratories on identical test material shall not exceed 0,20 g of total solids per 100 g of product on average more than once in 20 cases in the normal and correct operation of the method.

10 Test report

The test report shall show the method used and the results obtained. It shall also mention any operating details not specified in this International Standard, or regarded as optional, together with details of any incidents likely to have influenced the results.

The test report shall include all the information necessary for the complete identification of the sample.