



SLOVENSKI STANDARD

SIST EN 12145:1998

01-junij-1998

Sadni in zelenjavni sokovi - Določevanje celotne sušine - Gravimetrijska metoda s sušenjem

Fruit and vegetable juices - Determination of total dry matter - Gravimetric method with loss of mass on drying

Frucht- und Gemüsesäfte - Bestimmung der gesamten Trockensubstanz - Gravimetrisches Verfahren mit Masseverlust beim Trocknen

Jus de fruits et de légumes - Détermination du résidu sec total - Méthode gravimétrique par perte de poids a la dessiccation

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Ta slovenski standard je istoveten z: **EN 12145:1996**

ICS:

67.160.20 Brezalkoholne pijače Non-alcoholic beverages

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EUROPEAN STANDARD

EN 12145

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 1996

ICS 67.160.20

Descriptors: food products, beverages, fruit and vegetable juices, chemical analysis, determination, dry matter, gravimetric analysis, weight losses

English version

**Fruit and vegetable juices - Determination of total
dry matter - Gravimetric method with loss of mass
on drying**

Jus de fruits et de légumes - Détermination du résidu sec total - Méthode gravimétrique par perte de poids à la dessiccation (standards.iteh.ai) Frucht- und Gemüsesäfte - Bestimmung der gesamten Trockensubstanz - Gravimetrisches Verfahren mit Masseverlust beim Trocknen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 174 Fruit and vegetable juices - Methods of analysis" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 1997, and conflicting national standards shall be withdrawn at the latest by March 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies a gravimetric method for the determination of the total dry matter in fruit and vegetable juices and related products.

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN ISO 3696:1995 Water for analytical laboratory use - Specification and test methods

ISO 5725:1986 Precision of test methods - Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests

3 Principle

The determination of loss of mass on drying is carried out by mixing the sample thoroughly with kieselguhr or a similar material, pre-drying the mixture, and finally drying for 2 h in a vacuum oven at $70\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ and approximately 6,6 kPa (66 mbar) pressure.

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4 Reagents

Use only reagents of recognized analytical grade and water of at least grade 3 of EN ISO 3696:1995.

4.1 Kieselguhr or a similar material.

5 Apparatus

Usual laboratory apparatus and, in particular, the following :

5.1 Drying equipment

5.1.1 Vacuum drying oven with automatic temperature control, thermometer and vacuum manometer. This oven should be so constructed that the temperature variation across different parts of the interior does not exceed $2\text{ }^{\circ}\text{C}$.

5.1.2 Drying oven with ventilator, automatic temperature control and thermometer. This oven should allow for speedy circulation and a sufficient exchange with the external air so that the initial moisture can be rapidly removed.

5.1.3 Water-bath

5.2 Apparatus for drying the air, consisting of a column filled with freshly dried self-indicating silica gel (or a similar material). This drying column should be placed in series with a gas-washing flask filled with concentrated sulfuric acid, and the whole assembly connected to the air inlet of the vacuum oven. As a safety precaution, empty gas-washing flasks should be connected both before and after the flask of concentrated sulfuric acid.

5.3 Vacuum pump, to evacuate and maintain a pressure of no more than 6,6 kPa (66 mbar) in the oven.

5.4 Corrosion-resistant metal dish with a flat bottom and tightly closing lid, approximately 100 mm in diameter and at least 30 mm high.

5.5 Glass rod, long enough to reach over the edge of the dish.

5.6 Desiccator with freshly dried self-indicating silica gel (or equivalent).

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5.7 Analytical balance, with an accuracy of ± 1 mg.

6 Procedure

6.1 Preparation of the test sample

Normally products shall not be pre-treated and their analysis by this method shall be on a gravimetric basis, results being expressed as mass fraction in per cent.

Mix cloudy samples well before analysis.

6.2 Test procedure

6.2.1 Pre-drying stage

Weigh approximately 1,5 g of kieselguhr (4.1) into a metal dish (5.4). Place the dish and its lid separately into the oven (5.1.2) and dry at $110\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ for at least 4 hours. Then cover the dish, place in the desiccator (5.6) and weigh accurately after cooling to room temperature (m_2).

Weigh approximately 15 g of sample (correct to the nearest mg) into the dish (m_0). Do this quickly to avoid any loss of moisture by evaporation.

Mix the sample and the kieselguhr with the glass rod (5.5) and distribute the contents equally in the dish - dilution with a little distilled water may make this easier. Rinse the glass rod with distilled water.

The complete sample can now be taken to apparent dryness (pre-dried stage) by one of the following procedures :

- heat the sample on a boiling water bath (5.1.3) ;
- place the sample in the oven (5.1.2) maintained at 70 °C ;
- place the sample in the vacuum oven (5.1.1) maintained at 70 °C with the pressure reduced to about 41,3 kPa (413 mbar).

6.2.2 Final drying stage

Place the pre-dried sample (6.2.1) into the vacuum oven. Lower the pressure to approximately 6,6 kPa (66 mbar). Dry for 2 h at 70 °C ± 1 °C. Then close the vacuum tap and admit dry air until atmospheric pressure is reached.

Close the dish with its lid and place immediately into the desiccator and allow to cool to room temperature. Weigh dish with lid and contents accurately (m_1).

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7 Calculation

Calculate the total solids, in percent, from the following equation :

$$Ts = (m_1 - m_2) \times \frac{100}{m_0}$$

where :

- Ts is the total solids content, in percent ;
- m_0 is the original mass of sample in grams (6.2.1) ;
- m_1 is the mass of the dish containing kieselguhr, lid and dry residue in grams (6.2.2) ;
- m_2 is the mass of the dish containing kieselguhr and lid in grams (6.2.1).

Take into account the dilution factor and the relation of the value to mass or volume. If a concentrated product has been diluted to single strength, report the relative density of the single strength sample.

Report the total dry matter in percent (m/m) to two decimal places.

8 Precision

Details of the interlaboratory test on the precision of the method are summarized in Annex B. The values derived from the interlaboratory test may not be applicable to analyte concentration ranges and matrices other than given in Annex B.

8.1 Repeatability

The absolute difference between two single results found on identical test material by one operator using the same apparatus within the shortest feasible time interval will exceed the repeatability limit r in not more than 5 % of the cases.

The values are :

apricot nectar : $r = 0,13$.

tomato juice : $r = 0,10$.

8.2 Reproducibility

The absolute difference between two single test results on identical test material reported by two laboratories will exceed the reproducibility limit R in not more than 5 % of the cases.

The values are :

apricot nectar : $R = 0,56$;

tomato juice : $R = 0,32$.

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9 Test report

The test report shall contain the following data :

- all information necessary for the identification of the sample (kind of sample, origin of sample, designation) ;
- a reference to this European Standard ;
- the date and type of sampling procedure (if known) ;
- the date of receipt ;
- the date of test ;
- the test results and units in which they have been expressed ;
- whether the repeatability of the method has been verified ;
- any particular points observed in the course of the test ;