International Standard 751

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Fruit and vegetable products — Determination of water-insoluble solids content

Produits dérivés des fruits et légumes — Détermination de la teneur en résidu sec insoluble dans l'eau

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Foreword

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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.

International Standard ISO 751 was developed by Technical Committee ISO/TC 34, *Agricultural food products*, and was circulated to the member bodies in July 1980.

It has been approved by the member bodies of the following countries :

Australia	Hungary	Poland
Austria	India	Portugal
Brazil	Ireland	Romania
Bulgaria	Israel	South Africa, Rep. of
Canada	Korea, Rep. of	Spain
Chile	Malaysia	Sri Lanka
Czechoslovakia	Netherlands	Thailand
Egypt, Arab Rep. of	New Zealand	Turkey
France	Peru	USSR
Germany, F. R.	Philippines	

No member body expressed disapproval of the document.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

This International Standard cancels and replaces ISO Recommendation R 751-1968, of which it constitutes a technical revision.

Fruit and vegetable products — Determination of water-insoluble solids content

1 Scope and field of application

This International Standard specifies a method for the determination of the water-insoluble solids content of the edible parts of fruit and vegetable products.

2 Principle

Dissolution of the water-soluble matter in a test portion, filtration, drying of the residue and weighing.

3 Apparatus

Usual laboratory apparatus, and in particular :

3.1 Homogenizer or **mortar.**

3.2 Beakers, of capacity 250 or 400 ml.

3.3 Buchner funnel.

3.4 Filter paper, medium texture.

3.5 Indicator paper.

3.6 Weighing vessel.

3.7 Desiccator, containing an efficient desiccant.

3.8 Oven, capable of being controlled at 103 ± 2 °C.

3.9 Centrifuge (see 7.2).

3.10 Analytical balance.

4 Procedure

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

4.1 Preparation of the test sample

Separate and remove from the laboratory sample stalks, stones, hard seed-cavity walls, and whenever possible, pips (after thawing in the case of frozen or deep-frozen products). Mix the sample thoroughly.

Allow frozen or deep-frozen products to thaw in a closed vessel and add the liquid formed during this process to the product before mixing.

If it is desired to express the result in terms of the sample as received, weigh the latter before removing stalks, stones, etc; weigh these after washing and drying and take them into account in the expression of results (see 5.3).

4.2 Preparation of apparatus

Place a filter paper (3.4) in the weighing vessel (3.6) and dry in the oven (3.8), controlled at 103 ± 2 °C, for 30 min. Cool in the desiccator (3.7) and weigh to the nearest 0,001 g.

4.3 Test portion

Weigh, to the nearest 0,001 g, into a 250 ml beaker (400 ml in the case of sweetened products) 10 to 100 g of the test sample (4.1), according to the consistency of the product and the expected water-insoluble solids content, for example :

— tomato concentrate	10 g
— jam, fruit preserve	25 g
— pulpy products	50 g
— fruit and vegetable juices	100 g

NOTE — For liquid products, it is also possible to take the test portion by volume.

4.4 Determination

Add 100 to 150 ml of water to the beaker containing the test portion and stir with a glass rod until a homogeneous mixture is obtained. Heat to boiling (in the case of sweetened products, see 7.1).

Pour the contents of the beaker quantitatively onto the dried filter paper (see 4.2) placed in the Buchner funnel (3.3) and filter (see 7.2). Wash the filter paper with a little hot water.

Transfer the filter paper and its contents quantitatively to the weighing vessel (see 4.2) and dry in the oven (3.8), controlled at 103 ± 2 °C, to constant mass, i.e. until the difference between two consecutive weighings, after 30 min in the oven followed by cooling in the desiccator for about 20 min, does not exceed 0,001 g. Carry out the weighings to the nearest 0,001 g.

4.5 Number of determinations

Carry out two determinations on the same test sample (4.1).

5 Expression of results

5.1 Method of calculation and formula

The water-insoluble solids content of the edible parts of fruit and vegetable products, expressed as a percentage by mass, is equal to

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

where

m_0 is the mass, in grams, of the test portion (4.3);

m_1 is the mass, in grams, of the weighing vessel and dried filter paper (4.2);

m_2 is the mass, in grams, of the weighing vessel, filter paper, and residue after drying (4.4).

Take as the result the arithmetic mean of the values obtained in the two determinations (4.5), provided that the requirement for repeatability (see 5.2) is satisfied. Report the result to one decimal place.

5.2 Repeatability

The difference between the values obtained in the two determinations (4.5), carried out simultaneously or in rapid succession by the same analyst, shall not exceed 0,1 g of water-insoluble solids per 100 g of sample.

5.3 Other method of expression

It is also possible to express the result in relation to the sample as received (see 4.1) or, for liquid products, in grams per 100 ml for a test portion (4.3) taken by volume.

6 Special cases

6.1 Grape juice

If crystals of potassium hydrogen tartrate are found to be present in grape juice, the quantity should be determined. For this purpose, using another test portion, collect the crystals on a filter, wash them with the same juice and then with 50 % (*V*/*V*) ethanol solution saturated with potassium hydrogen tartrate.

Dry and weigh the crystals. The mass of the crystals shall be recorded in the test report.

6.2 Citrus products

A similar procedure may be followed when crystals of hesperiden or naringin are present in citrus products.

7 Notes on procedure

7.1 For the analysis of sweetened products, add about 250 ml of water, bring to the boil and boil gently for 5 to 10 min.

7.2 If it proves difficult to filter the product (products with high contents of pectin or protein) or in the case of products having high sugar contents (fruit preserves, jam etc.), separate the solid matter by means of a centrifuge. Decant the clear liquid, recover the residue (deposit), obtained by centrifuging, with hot water and again centrifuge. Repeat these operations several times, until the washings are free from sugars, salts, acids, etc., then collect the residue obtained by centrifuging on the filter.

8 Test report

The test report shall show the method used and the result obtained, indicating clearly the method of expression used. It shall also mention any operating conditions not specified in this International Standard or regarded as optional, as well as any circumstances that may have influenced the results.

The report shall include all details required for complete identification of the sample.