

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 762

FRUIT AND VEGETABLE PRODUCTS

DETERMINATION OF MINERAL IMPURITIES

1st EDITION

June 1968

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BRIEF HISTORY

The ISO Recommendation R 762, *Fruit and vegetable products – Determination of mineral impurities*, was drawn up by Technical Committee ISO/TC 34, *Agricultural food products*, the Secretariat of which is held by the Magyar Szabványügyi Hivatal (MSZH).

Work on this question by the Technical Committee began in 1960 and led, in 1964, to the adoption of a Draft ISO Recommendation.

In October 1966, this Draft ISO Recommendation (No. 1022) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Hungary	Romania
Brazil	India	South Africa,
Bulgaria	Iran	Rep. of
Chile	Ireland	Thailand
Colombia	Israel	Turkey
Czechoslovakia	Korea, Rep. of	United Kingdom
France	Netherlands	U.S.S.R.
Germany	Poland	Yugoslavia
Greece	Portugal	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in June 1968, to accept it as an ISO RECOMMENDATION.

FRUIT AND VEGETABLE PRODUCTS

DETERMINATION OF MINERAL IMPURITIES

1. SCOPE

1.1 This ISO Recommendation describes a procedure for the determination, by the flotation method, of mineral impurities in fruit and vegetable products.

1.2 Field of application

This method serves for the determination of heavy impurities, generally originating from the soil (sand) but which can also consist of metallic or mineral fragments of high density.

Siliceous impurities are determined by the method described in ISO Recommendation R 763, *Products derived from fruits and vegetables — Determination of ash insoluble in hydrochloric acid*.

2. PRINCIPLE

Separation of organic matter by washing, incineration at 500 to 600 °C and weighing of the residue obtained.

3. APPARATUS

- 3.1 *Muffle furnace*, regulated at 500 to 600 °C.
- 3.2 *Analytical balance*.
- 3.3 *Blender*.
- 3.4 *Desiccator*, containing an efficient desiccant.
- 3.5 *Beakers*, 250 and 600 ml.
- 3.6 *Dish*, of quartz, porcelain or platinum.
- 3.7 *Filter paper*, ashless.
- 3.8 *Separating funnel*, 2 litres, provided with a wide-bore tap (see figure) for continuous separating, or
- 3.9 *Conical glass vessel with foot*, 1000 ml, for discontinuous separation.

4. PROCEDURE

4.1 Preparation of sample

Thoroughly mix the laboratory sample*, using the blender (3.3) if necessary. Frozen products should first be thawed.

4.2 Test portion

Weigh into the 250 ml beaker :

- from 50 to 100 g of the sample prepared as described in clause 4.1 for liquid products, thick products or frozen products,
- 20 g of the sample prepared as described in clause 4.1 for dried products.

Transfer this test portion to the 600 ml beaker and add 200 to 250 ml of water; bring the mixture to the boil, then leave it overnight at ambient temperature to allow the product to rehydrate. To ensure that the product is as finely divided as possible, pass this mixture again through the blender.

4.3 Separation by the continuous method

Pour the test portion into the separating funnel (3.8), partly filled with water, and adjust the dip tube so that its lower end is not above the middle of the funnel. Introduce a current of water adjusted so as to give rise to a vortex allowing the mineral matter adhering to the pulp to be separated. Remove the suspended pulp, without drawing off sand, and for this purpose lower the dip tube into the tubular portion of the separating funnel.

Continue the operation until there are only the mineral impurities at the bottom of the funnel; sometimes the residue may also contain heavy organic fragments (tomato pips, for example).

Put the separating funnel over a filter funnel provided with the ashless filter paper (3.7) in order to collect the whole of the residue. Rinse the filter with distilled water, then put the filter paper and residue into the dish (3.6).

The apparatus shown in the Figure given in the Annex can be used in applying this method.

4.4 Separation by the discontinuous method

Transfer the test portion into the 1000 ml vessel (3.9) and add water until this is three-quarters full.

Mix carefully the contents of the vessel and keep it in a slightly inclined position so that the mineral impurities deposit at the bottom. After 15 minutes decant the solution and part of the pulp.

Again add water to the residue, and repeat the decantation until the water contains practically only sand, the organic matter having been removed.

Transfer the residue to the 250 ml beaker (3.5) and filter it through the ash-free filter paper (3.7). Place the filter paper and the residue in the previously weighed dish (3.6).

* Pending the completion of an ISO Recommendation on the sampling of fruit and vegetable products, the term "laboratory sample" is used in the English text to denote the sample as delivered to the laboratory.

4.5 Incineration

Dry the dish, residue and filter paper together, then calcine over a low flame and finally incinerate in the muffle furnace (3.1) at 500 to 600 °C for 30 minutes.

Allow to cool in the desiccator (3.4) and weigh to the nearest 0.0002 g.

4.6 Carry out at least two determinations on the same prepared sample.

5. EXPRESSION OF RESULTS**5.1 Method of calculation and formula**

The content of mineral impurities, 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 grammes, of the test portion,

M_1 is the mass, in grammes, of the dish,

M_2 is the mass, in grammes, of the dish and ash.

Take as the result the arithmetic mean of the two determinations, if the requirement concerning repeatability is satisfied.

Report the result to the first decimal place.

5.2 Repeatability

The difference between two determinations carried out simultaneously or in rapid succession by the same analyst should not exceed 0.01 g of mineral impurities per 100 g of sample.

6. TEST REPORT

The test report should show the method used and the result obtained. It should also mention any operating conditions not specified in this ISO Recommendation, or regarded as optional, as well as any circumstances that may have influenced the result.

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

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