SLOVENSKI STANDARD
SIST ISO 7541:1997

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Mleta paprika (v prahu) - Določanje celotnih naravnih barvil

Ground (powdered) paprika -- Determination of total natural colouring matter content

Paprika en poudre -- Détermination de la teneur en matières colorantes naturelles

Ta slovenski standard je istoveten z: **ISO 7541:1989**

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INTERNATIONAL STANDARD

ISO 7541

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Ground (powdered) paprika — Determination of total natural colouring matter content

Paprika en poudre — Détermination de la teneur en matières colorantes naturelles

Reference number
ISO 7541:1989(E)

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 7541 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

The method specified in this International Standard has been developed on the basis of the American Spices Trade Association (ASTA) 20/1 method.

For better application, further editorial details have been introduced and modifications have been made to the procedure on the following essential points:

— duration of extraction;

— zone of optimal absorbance;

— expression of results.

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Ground (powdered) paprika — Determination of total natural colouring matter content

1 Scope

This International Standard specifies a method for the determination of the total natural colouring matter content of ground (powdered) paprika.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 939:1980, *Spices and condiments — Determination of moisture content — Entrainment method.*

ISO 948:1980, *Spices and condiments — Sampling.*

ISO 2825:1981, *Spices and condiments — Preparation of a ground sample for analysis.*

3 Principle

Extraction of the natural colouring matter content of ground paprika with acetone. Measurement of the absorbance of the solution obtained using a spectrometer at a wavelength of 460 nm.

4 Reagents

All reagents shall be of recognized analytical grade. The water used shall be distilled water or water of equivalent purity.

4.1 Acetone.

4.2 Sulfuric acid, 5 % (*V/V*) solution (to check the spectrometer, if necessary).

4.3 Standard colour solution (to check the spectrometer, if necessary), prepared as follows.

Weigh, to the nearest 0,000 2 g, 1,350 0 g of cobalt chloride hexahydrate ($CoCl_2.6H_2O$) and 0,012 5 g of potassium dichromate ($K_2Cr_2O_7$) into a conical flask. Add 20 ml of the 5 % (*V/V*) sulfuric acid solution (4.2). Transfer this solution quantitatively into a 100 ml volumetric flask that has previously been rinsed with the sulfuric acid solution (4.2), further rinsing the conical flask three times with small quantities of the sulfuric acid solution. Then dilute to the mark with the sulfuric acid solution.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

5.1 Spectrometer, suitable for measurements at wavelengths of 460 nm, 465 nm and 477 nm, fitted with cells of 1 cm thickness.

5.2 Sieve, of nominal aperture size 0,63 mm.

5.3 Analytical balance.

5.4 Shaking machine, set to a speed of 270 to 300 vibrations per minute.

5.5 Volumetric flasks, of 250 ml capacity, made of amber glass.

5.6 Graduated pipette, of 5 ml capacity, fitted with a safety bulb.

5.7 Coloured glass filter, (to check the spectrometer, if necessary). US standard filter NBS SRM 2030[1] is suitable.

6 Sampling

Sampling shall have been carried out in accordance with ISO 948.

7 Preparation of the test sample

Prepare the test sample in accordance with ISO 2825, taking care to grind the material sufficiently so that it all passes through the sieve (5.2). Mix well.

8 Procedure

8.1 Spectrometer check

8.1.1 With a standard colour solution

Measure the absorbance of the standard colour solution (4.3) at 477 nm (the wavelength of maximum absorption of the solution) in a cell 1 cm thick against the sulfuric acid solution (4.2). The theoretical absorbance of this solution is 0,315. If the value found is different, calculate the correction factor, f, using the equation

$$f = \frac{0{,}315}{A_{477}}$$

where A_{477} is the absorbance measured.

8.1.2 With a coloured glass filter

Measure the absorbance of the filter (5.7) at 465 nm (the wavelength of maximum absorption of the filter). If the value found is different from that given by the manufacturer, calculate the correction factor, f, using the equation

$$f = \frac{A_i}{A_m}$$

where

A_i is the absorbance of the filter given by the manufacturer;

A_m is the measured absorbance of the filter.

8.2 Moisture content of the test sample

Determine the moisture content of the test sample in accordance with ISO 939.

8.3 Test portion and preparation of the test solution

Weigh, to the nearest 0,000 2 g, 0,1 g of the test sample (clause 7). Transfer the test portion into a 250 ml volumetric flask (5.5) and add 200 ml of the acetone (4.1). Attach the flask to the shaking machine (5.4) which shall be protected from the light. Shake the flask for 4 h, then remove it from the shaking machine. Partially invert the flask to dislodge particles of ground paprika from the upper glass surfaces, and dilute to the mark with the acetone (4.1). Shake well; then let it stand for 10 min.

8.4 Determination

Transfer by means of a pipette (5.6), a suitable quantity of the clear solution obtained (8.3) into the spectrometer cell (5.1). Measure the absorbance of the test solution at 460 nm, using acetone as the blank. The absorbance value shall be between 0,3 and 0,5. If the measured absorbance value falls outside of this range, repeat the determination using a different test portion.

8.5 Number of determinations

Carry out two determinations on the same test sample.

9 Expression of results

9.1 Method of calculation

The total natural colouring matter content, C, of the ground paprika, expressed as grams of capsanthin per kilogram of sample, on a dry basis, is given by the following formula:

$$C = \frac{A \times f \times 2{,}5 \times 10^5}{2250 \times (100 - H) \times m}$$

where

A is the absorbance of the test solution;

f is the correction factor, if necessary, of the spectrometer (see 8.1);

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1) US standard filter NBS SRM 2030 is obtainable from:

Office of Standard Reference Materials, Room B311 Chemistry Building, National Institute of Standards and Technology (formerly the National Bureau of Standards), Gaithersburg, MD 20899, USA.

H is the moisture content of the test sample, expressed as a percentage by mass (see 8.2);

m is the mass, in grams, of the test portion;

2 250 is the absorption coefficient of capsanthin;

$2{,}5 \times 10^5$ is a conversion factor.

Take as the result the arithmetic mean of the two determinations (8.5) if the conditions for repeatability (9.2.1) have been fulfilled.

Report the result to one decimal place.

NOTE 1 The colouring matter content may also be expressed as the ASTA Color by using the following formula:

$$\text{ASTA Color} = \frac{A \times (250/100) \times f}{m} \times 16{,}4$$

where

A, f, m have the same meaning as defined above;

250/100 is the factor for conversion from the dilution used in this International Standard to the dilution used in the ASTA standard;

16,4 is an arbitrary factor chosen by ASTA.

9.2 Precision

9.2.1 Repeatability

The difference between the results of two determinations, carried out in rapid succession by the same analyst using the same apparatus on the same test sample, shall not exceed 0,1 g of colouring matter content per kilogram of sample as received.

9.2.2 Reproducibility

The difference between the values of the final results obtained by two laboratories using this method for the analysis of the same laboratory sample shall not exceed 0,3 g of colouring matter content per kilogram of sample as received.

10 Test report

The test report shall specify the method used and the result obtained. It shall also mention all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents which may have influenced the result.

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