SLOVENSKI STANDARD
SIST EN 15585:2009

01-januar-2009

Žito in žitni proizvodi - Pšenica durum (T. durum Desf.) - Ugotavljanje odstotka v lisastih zrnih in raļ unanje odstotka zrn steklastega izgleda

Cereals and cereal products - Durum wheat (T. durum Desf.) - Determination of percentage of mitadine grains and calculation of percentage of vitreous grains

Getreide- und Getreideerzeugnisse - Hartweizen (T. Durum Desf.) - Bestimmung des prozentualen Anteils an mehligen Körnern und Berechnung des prozentualen Anteils an glasigen Körnern

Céréales et produits céréaliers - Blé dur (T. durum Desf.) - Détermination du taux de mitadinage et calcul du taux de vitrosité

Ta slovenski standard je istoveten z: **EN 15585:2008**

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67.060	Žita, stroļ nice in proizvodi iz njih	Cereals, pulses and derived products

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Cereals and cereal products - Durum wheat (T. durum Desf.) - Determination of percentage of mitadine grains and calculation of percentage of vitreous grains

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Foreword

This document (EN 15585:2008) has been prepared by Technical Committee CEN/TC 338 “Cereal and cereal products”, 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of an identical text or by endorsement, at the latest by January 2009, and conflicting national standards shall be withdrawn at the latest by January 2009.

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1 Scope

This European Standard specifies a reference method for the determination of the proportion of mitadine grains, applicable exclusively to durum wheat (*Triticum durum* Desf.).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15587, *Cereals and cereal products - Determination of Besatz in wheat (Triticum aestivum L.), durum wheat (*Triticum durum *Desf.), rye (*Secale cereale *L.) and feed barley (*Hordeum vulgare *L.)*

EN ISO 6644, *Flowing cereals and milled cereal products - Automatic sampling by mechanical means (ISO 6644:2002)*

EN ISO 13690, *Cereals, pulses and milled products - Sampling of static batches (ISO 13690:1999)*

prEN ISO 24333, *Cereals and cereal products - Sampling (ISO/DIS 24333:2008)*

ISO 5223, *Test sieves for cereals*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
vitreous grain
translucent grain, the cut grain having a smooth, shiny surface without any mealy appearance

3.2
mitadine grain
durum wheat grain which is not considered to be completely vitreous under the conditions of this European Standard

NOTE In some countries, these grains are also called piebald grains.

3.3
proportion of mitadine grains
percentage by mass of mitadine grains in a sample of durum wheat as determined with the method described in this European Standard

3.4
proportion of vitreous grains
percentage by mass as calculated with the formula given in 8

4 Principle

Removal of any impurities, including grains of common wheat (*Triticum aestivum*), by sifting and sorting by hand according to EN 15587, followed by separation of visibly mitadine grains, and verification of the vitreous state of the other grains after cutting with a scalpel.

5 Apparatus

5.1 Sample divider

5.2 Sieve, with perforated plate having slots 1,9 mm x 20,0 mm, complying with the requirements of ISO 5223.

5.3 Scalpel.

5.4 Balance, having an accuracy of 0,1 g.

6 Sampling

It is important the laboratory receive a sample which is truly representative and has not been damaged or changed during transport and storage.

Sampling is not part of the method specified in this International Standard. Recommended sampling methods are given in EN ISO 6644, EN ISO 13690 and prEN ISO 24333.

7 Procedure

7.1 Preparation of the test sample

7.1.1 Take approximately 50 g of the laboratory sample using the sample divider (5.1), and weigh it to the nearest 0,1 g (mass *m*).

7.1.2 Place the test sample on the sieve (5.2) and shake by hand or machine for 30 s, keeping the sieve horizontal and moving it in the direction parallel with the length of the slots. Discard the material passing through the sieve.

7.1.3 Remove by hand any impurities in the sample retained on the sieve. Grains of common wheat (*Triticum aestivum* L.) shall be considered to be impurities.

7.2 Test portion

Weigh the mass of durum wheat grains thus prepared to the nearest 0,1 g.

7.3 Determination

7.3.1 Spread the test portion (7.2) over a flat surface. Examine each grain individually with the naked eye (corrected, if necessary, for abnormal vision).

7.3.2 Separate out all grains which are visibly mitadine.

NOTE Do not confuse mitadine grains with “washed grains”, the external appearance of which is similar to that of completely mealy grains, but which differ in their dull appearance. Washed grains are not necessarily mealy.

7.3.3 Using the scalpel (5.3), cut transversely all the remaining grains through the middle and remove both parts of each grain which, when cut, prove to be mitadine.

7.3.4 Gather and weigh to the nearest 0,1 g:

— firstly, grains which are visibly mitadine, and both parts of those grains which when cut proved to be mitadine (mass m_1);

— secondly, the parts of the vitreous grains (mass m_2).

7.3.1 The determination is considered to be valid if (m_1 + m_2) does not differ from the mass of the test portion (7.2) by more than 0,5 %. If this is not the case, carry out the determination again on a new test sample.

8 Expression of results

8.1 Methods of calculation and formulae

8.1.1 The proportion of mitadine grains, expressed in percentage regarding the raw sample as received (7.1.1) (before sieving and removal of impurities), is equal to:

$$\frac{m_1}{m} \times 100 \quad (1)$$

where

m is the mass, in grams, of the test sample taken in 7.1.1;

m_1 is the mass, in grams, of the mitadine grains (see 7.3).

8.1.2 The proportion of mitadine grains, expressed in percentage regarding the sieved test sample from which impurities have been removed (7.1.3), is equal to:

$$\frac{m_1}{m_1 + m_2} \times 100 \quad (2)$$

where

m_1 is the mass, in grams, of the mitadine grains (see 7.3);

m_2 is the mass, in grams, of the vitreous grains (see 7.3).

8.1.3 The proportion of vitreous grains, expressed in percentage regarding the raw sample as received (7.1.1), is equal to:

$$\frac{m_2}{m} \times 100 \quad (3)$$

where

m is the mass, in grams, of the test sample taken in 7.1.1.

m_2 is the mass, in grams, of the vitreous grains (see 7.3).

8.1.4 The proportion of vitreous grains, expressed in percentage regarding the sieved test sample from which impurities have been removed (7.1.3), is equal to:

$$\frac{m_2}{m_1 + m_2} \times 100 \quad (4)$$

where

m_1 is the mass, in grams, of the mitadine grains (see 7.3);

m_2 is the mass, in grams, of the vitreous grains (see 7.3).

8.2 Number of determinations

Carry out two determinations on different samples taken from the same laboratory sample.

If the difference between the two determinations is bigger than the repeatability limit (see 9.1), carry out two new determinations. If with these two other determinations, the difference is bigger than the repeatability limit, take the mean of the four determinations as the result.

If the difference between the two determinations is lower or equal to the repeatability limit (see 9.1), take the mean of the two determinations as the result. Express the result with one decimal.

9 Precision

9.1 Interlaboratory test

Details of an international interlaboratory test on the precision of the method are summarized in Annex A. The values derived from this test may not be applicable to mitadine concentration ranges and matrices other than those given, namely from 10 % to 55 %.

9.2 Repeatability limit (*r*)

The absolute difference between two independent single test results, obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time will not in more that 5 % of cases be greater than the repeatability limit (*r*) given hereunder:

$r = 2{,}77 \times s_r = 2{,}77 \times (1{,}05) = 2{,}9$ (5)

where

s_r is the repeatability standard deviation.

9.3 Reproducibility limit (R)

The absolute difference between two single test results, obtained using the same method on identical test material in different laboratories with different operators using different equipment, will not in more that 5 % of cases be greater than the reproducibility limit (*R*) given hereunder:

$R = 2{,}77 \times s_R = 2{,}77 \times 3{,}43 = 9{,}5$ (6)

where

s_R is the reproducibility standard deviation.

9.4 Critical difference (CD)

When the difference between two averaged values obtained from two test results under repeatability conditions is to be assessed, the repeatability limit cannot be used: Critical Difference shall be used.

9.4.1 Comparison of two groups of measurements in one laboratory

The critical difference (CD_1) between two averaged values obtained in one laboratory from two test results under repeatability conditions is equal to:

$$CD_1 = 2{,}77\ s_r \sqrt{\frac{1}{2n_1} + \frac{1}{2n_2}} = 2{,}77\, s_r \sqrt{\frac{1}{2}} = 1{,}96\, s_r = 2{,}06 \quad (7)$$