SLOVENSKI STANDARD
SIST EN ISO 4120:2007

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Senzoriļ na analiza - Metodologija - Preskus "triangel" (ISO 4120:2004)

Sensory analysis - Methodology - Triangle test (ISO 4120:2004)

Sensorische Analyse - Prüfverfahren - Dreiecksprüfung (ISO 4120:2004)

Analyse sensorielle - Méthodologie - Essai triangulaire (ISO 4120:2004)

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English Version

Sensory analysis - Methodology - Triangle test (ISO 4120:2004)

Analyse sensorielle - Méthodologie - Essai triangulaire (ISO 4120:2004)

Sensorische Analyse - Prüfverfahren - Dreiecksprüfung (ISO 4120:2004)

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Foreword

The text of ISO 4120:2004 has been prepared by Technical Committee ISO/TC 34 "Agricultural food products" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 4120:2007 by Technical Committee CEN/SS C01 "Food Products", the secretariat of which is held by CMC.

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of an identical text or by endorsement, at the latest by January 2008, and conflicting national standards shall be withdrawn at the latest by January 2008.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 4120:2004 has been approved by CEN as EN ISO 4120:2007 without any modifications.

INTERNATIONAL STANDARD

ISO 4120

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Sensory analysis — Methodology — Triangle test

Analyse sensorielle — Méthodologie — Essai triangulaire

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4120 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 12, *Sensory analysis*.

This second edition cancels and replaces the first edition (ISO 4120:1983), which has been technically revised.

Sensory analysis — Methodology — Triangle test

1 Scope

This International Standard describes a procedure for determining whether a perceptible sensory difference or similarity exists between samples of two products. The method is a forced-choice procedure. The method is applicable whether a difference exists in a single sensory attribute or in several attributes.

The method is statistically more efficient than the duo-trio test (described in ISO 10399), but has limited use with products that exhibit strong carryover and/or lingering flavours.

The method is applicable even when the nature of the difference is unknown [i.e. it determines neither the size nor the direction of difference between samples, nor is there any indication of the attribute(s) responsible for the difference]. The method is applicable only if the products are fairly homogeneous.

The method is effective for

a) determining that
   - either a perceptible difference results (triangle testing for difference), or
   - a perceptible difference does not result (triangle testing for similarity) when, for example, a change is made in ingredients, processing, packaging, handling or storage;

b) or for selecting, training and monitoring assessors.

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.

ISO 5492:1992, *Sensory analysis — Vocabulary*

ISO 8589:1988, *Sensory analysis — General guidance for the design of test rooms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5492 and the following apply.

3.1
alpha-risk
α-risk
probability of concluding that a perceptible difference exists when one does not

NOTE This is also known as Type I error, significance level or false positive rate.

3.2
beta-risk
***β*-risk**
probability of concluding that no perceptible difference exists when one does

NOTE This is also known as Type II error or false negative rate.

3.3
difference
situation in which samples can be distinguished based on their sensory properties

NOTE The proportion of assessments in which a perceptible difference is detected between the two products is given the symbol p_d.

3.4
product
material to be evaluated

3.5
sample
unit of product prepared, presented and evaluated in the test

3.6
sensitivity
general term used to summarize the performance characteristics of the test

NOTE In statistical terms, the sensitivity of the test is defined by the values of α, β and p_d.

3.7
similarity
situation in which any perceptible differences between the samples are so small that the products can be used interchangeably

3.8
triad
those three samples given to an assessor in the triangle test

NOTE In the triangle test, each sample is marked with a different code. Two of the samples are alike (i.e. from one product) and one is different (i.e. from the other product).

4 Principle

The number of assessors is chosen based on the sensitivity desired for the test. (See 6.2 and the discussion in A.3.)

Assessors receive a set of three samples (i.e. a triad) and are informed that two of the samples are alike and that one is different. The assessors report which sample they believe to be different, even if the selection is based only on a guess.

The number of correct responses is counted and the significance is determined by reference to a statistical table.

5 General test conditions and requirements

5.1 Clearly define the test objective in writing.

5.2 Carry out the test under conditions that prevent communication among assessors until all the evaluations have been completed, using facilities and booths that comply with ISO 8589.

5.3 Prepare the samples out of sight of the assessors and in an identical manner (i.e. same apparatus, same vessels, same quantities of product).

5.4 Assessors shall not be able to identify the samples from the way in which they are presented. For example, in a taste test, avoid any differences in appearance. Mask any irrelevant colour differences using light filters and/or subdued illumination.

5.5 Code the vessels containing the samples in a uniform manner, preferably using three-digit numbers, chosen at random for each test. Each triad is composed of three samples, each with a different code. Preferably, different codes should be used for each assessor during a session. However, the same three codes may be used for all assessors within a test, provided that each code is used only once per assessor during a test session (e.g. if several triangle tests on different products are being conducted in the same session).

5.6 The quantity or volume served shall be identical for the three samples in each triad, just as that of all the other samples in a series of tests on a given type of product. The quantity or volume to be evaluated may be imposed. If it is not, the assessors should be told to take quantities or volumes that are always similar whatever the sample.

5.7 The temperature of the three samples in each triad shall be identical, just as that of all the other samples in a series of tests on a given type of product. It is preferable to present the samples at the temperature at which the product is generally consumed.

5.8 The assessors shall be told whether or not they are to swallow the samples or whether they are free to do as they please. In this latter case, they shall be requested to proceed in the same manner for all the samples.

5.9 During the test sessions, avoid giving information about product identity, expected treatment effects, or individual performance until all testing is completed.

6 Assessors

6.1 Qualification

All assessors should possess the same level of qualification, this level being chosen on the basis of the test objective (see ISO 8586-1 and ISO 8586-2 for guidance). Experience and familiarity with the product may improve the performance of an assessor and, therefore, may increase the likelihood of finding a significant difference. Monitoring the performance of assessors over time may be useful for increased sensitivity.

All assessors shall be familiar with the mechanics of the triangle test (i.e. format, task and evaluation procedure).

6.2 Number of assessors

Choose the number of assessors so as to obtain the sensitivity required for the test (see the discussion in A.3). Using large numbers of assessors increases the likelihood of detecting small differences between the products. However, in practice, the number of assessors is often determined by material conditions (e.g. duration of the experiment, number of available assessors, quantity of product). When testing for a difference, typical numbers of assessors are between 24 and 30. When testing for no meaningful difference (i.e. similarity), twice as many assessors (i.e. approximately 60) are needed for equivalent sensitivity.