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Milk and milk products — Sensory analysis

Part 3: Guidance on a method for evaluation of compliance with product specifications for sensory properties by scoring

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British Standards

National foreword

This British Standard is the UK implementation of ISO 22935-3:2009.

The UK participation in its preparation was entrusted to Technical Committee AW/5, Chemical analysis of milk and milk products.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Part 3: Guidance on a method for evaluation of compliance with product specifications for sensory properties by scoring

Lait et produits laitiers — Analyse sensorielle —

Partie 3: Lignes directrices pour une méthode d'évaluation de la conformité aux spécifications de produit pour les propriétés sensorielles par notation

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Foreword

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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.

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ISO 22935-3|IDF 99-3 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It being published jointly by ISO and IDF.

ISO 22935|IDF 99 consists of the following parts, under the general title *Milk and milk products — Sensory analysis*:

— *Part 1: General guidance for the recruitment, selection, training and monitoring of assessors*

— *Part 2: Recommended methods for sensory evaluation*

— *Part 3: Guidance on a method for evaluation of compliance with product specifications for sensory properties by scoring*

Foreword

IDF (the International Dairy Federation) is a non-profit organization representing the dairy sector worldwide. IDF membership comprises National Committees in every member country as well as regional dairy associations having signed a formal agreement on cooperation with IDF. All members of IDF have the right to be represented on the IDF Standing Committees carrying out the technical work. IDF collaborates with ISO in the development of standard methods of analysis and sampling for milk and milk products.

Draft International Standards adopted by the Action Teams and Standing Committees are circulated to the National Committees for voting. Publication as an International Standard requires approval by at least 50 % of the IDF National Committees casting a vote.

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All work was carried out by the Joint ISO-IDF Action Team on *Statistics and sampling* of the Standing Committee on *Quality assurance, statistics of analytical data & sampling* under the aegis of its project leader: Mr. S. Solem (NO).

ISO 22935 | IDF 99 consists of the following parts, under the general title *Milk and milk products — Sensory analysis*:

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This edition of ISO 22935-3 | IDF 99-3, together with ISO 22935-1 | IDF 99-1 and ISO 22935-2 | IDF 99-2, cancels and replaces IDF 99C:1997, which has been technically revised.

Introduction

The purpose of ISO 22935|IDF 99 (all parts) is to give guidance on methodology for sensory analysis and the use of a common nomenclature of terms for milk and milk products.

ISO 22935|IDF 99 is divided into the three parts listed in the forewords.

ISO 6658 should be consulted for an overview of sensory methods other than the one provided in this part of ISO 22935|IDF 99.

Evaluation of labelling and packaging is not covered by ISO 22935|IDF 99 (all parts).

INTERNATIONAL STANDARD

ISO 22935-3:2009(E)
IDF 99-3:2009(E)

Milk and milk products — Sensory analysis —

Part 3:
Guidance on a method for evaluation of compliance with product specifications for sensory properties by scoring

1 Scope

This part of ISO 22935|IDF 99 gives guidance on a general method for evaluation of compliance with product specifications for sensory properties based on sensory scoring and the use of a common nomenclature of terms.

The method is especially applicable in process and quality control performed regularly on a larger number of samples and/or with some time pressure and/or with a limited number of expert assessors available.

The results from the method may be part of product classification systems for domestic and international trade. Classification systems are not covered by this part of ISO 22935|IDF 99.

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 4121, *Sensory analysis — Guidelines for the use of quantitative response scales*

ISO 5492, *Sensory analysis — Vocabulary*

ISO 5496, *Sensory analysis — Methodology — Initiation and training of assessors in the detection and recognition of odours*

ISO 6658, *Sensory analysis — Methodology — General guidance*

ISO 8586-1, *Sensory analysis — General guidance for the selection, training and monitoring of assessors — Part 1: Selected assessors*

ISO 8586-2, *Sensory analysis — General guidance for the selection, training and monitoring of assessors — Part 2: Expert sensory assessors*

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

ISO 13300-1, *Sensory analysis — General guidance for the staff of a sensory evaluation laboratory — Part 1: Staff responsibilities*

ISO 13300-2, *Sensory analysis — General guidance for the staff of a sensory evaluation laboratory — Part 2: Recruitment and training of panel leaders*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 22935-1|IDF 99-1, *Milk and milk products — Sensory analysis — General guidance for the recruitment, selection, training and monitoring of assessors*

ISO 22935-2|IDF 99-2, *Milk and milk products — Sensory analysis — Recommended methods for sensory evaluation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4121, ISO 5492, ISO 5496, ISO 6658, ISO 8586-1, ISO 8586-2, ISO 8589, ISO 22935-1|IDF 99-1 and the following apply.

3.1
property
⟨sensory analysis of milk products⟩ overall appearance, consistency or odour/flavour of a sample

4 Principle

Sensory properties of individual samples of milk and milk products are analysed under standardized conditions by a panel of expert milk and milk product assessors. Each assessor evaluates the samples independently of the other assessors and uses a discrete five point interval scale to estimate the magnitude of a possible deviation in a product from a pre-established sensory product specification. When the score of each assessor is 3 or lower, then the score is supplemented by common terms which describe the character of the sensory deviation. The mean values of the panel, supplemented with the representative terms when the mean values are lower than 3,6, gives the result of the method.

5 General test requirements

The method shall be used in conjunction with ISO 22935-1|IDF 99-1 and ISO 22935-2|IDF 99-2. Follow also the general guidance on the methodology of sensory analysis given in ISO 6658. When relevant, it is also recommended that the general requirements for the competence to carry out tests given in ISO/IEC 17025 with supplemental documents specific for sensory testing laboratories (such as EA-4/09 [5]) be followed.

5.1 Test room

Conduct the sensory analysis in a special test room with standardized conditions which are monitored regularly when testing. See ISO 22935-2|IDF 99-2 and ISO 8589 for the characteristics of the room in which the tests are to be performed.

5.2 Assessors

Assessors shall be recruited, selected, trained and monitored to satisfy the criteria for expert milk and milk product assessors. See ISO 22935-1|IDF 99-1, ISO 8586-1, ISO 8586-2, and ISO 5496 for general guidance.

5.3 Panel

The number of assessors in the panel shall be at least three. See also ISO 22935-1|IDF 99-1 for additional requirements for assessors in the panel and ISO 22935-2|IDF 99-2 for general guidelines for the preparation of a panel.

5.4 Panel leader

A panel leader familiar with sensory evaluation of the products shall be responsible for the entire procedure and shall normally not participate in the panel. The panel leader may, however, be a panel member in regular process or quality control situations (e.g. at processing dairy plants), if the number of assessors at the site is limited and the panel leader satisfies the criteria for expert milk and milk product assessors. See also ISO 22935-2 | IDF 99-2, ISO 13300-1, and ISO 13300-2 for additional requirements for the panel leader.

5.5 Documents

Necessary documents for the sensory evaluation of the various products shall be available. The documents shall be standardized and common to all comparable sensory evaluations utilizing this method, e.g. in a specific process or quality control in a company or region.

5.5.1 Specific methods for specific milk and milk products

Specific methods shall supplement this part of ISO 22935 | IDF 99 and shall specify in detail necessary apparatus, sampling procedure, the preparation of samples for sensory analysis, and the sensory evaluation of specific milk and milk products. See also ISO 22935-2 | IDF 99-2 for recommended methods.

5.5.2 Product specifications

A pre-established sensory product specification shall describe the sensory requirements to be fulfilled to establish the fitness of the product for purpose in a specific market. For example, the description may be a sensory profile (ISO 13299 [4]) obtained by profiling products that have been found fit for purpose by consumer testing. A control sample may, if available, supplement the sensory product specification.

5.5.3 Nomenclature of terms

A nomenclature of terms shall include all terms relevant for objectively describing the character of sensory deviations in a specific milk or milk product from the description in the sensory product specification. See also ISO 22935-2 | IDF 99-2 for recommended terms for specific milk and milk products.

In some cases, where the character of the deviation is described by a term which is also a part of the sensory product specification, and it is difficult to find an alternative objective description which covers the actual deviation, it may be necessary to add “low intensity” or “high intensity” to the term in the nomenclature of the specific product (e.g. “low intensity of sweetness” or “high intensity of sweetness”).

The nomenclature may include guidelines for the assessors to give information regarding the significance of the specific terms, and their combinations, for estimating the magnitude of the deviation from the sensory product specification.

6 Apparatus

Select the apparatus according to the nature of the milk or milk products to be analysed. The selected apparatus shall not affect the test samples or the assessors in an undesired manner and the functioning and use shall, when relevant, be monitored regularly when testing. See also ISO 22935-2 | IDF 99-2 for recommended apparatus for sensory evaluation of specific milk and milk products.

7 Sampling

Sampling is not part of the method specified in this part of ISO 22935 | IDF 99. Unless special requirements are given for the sampling, a recommended sampling method is given in ISO 707 | IDF 50 [1] (see also ISO 22935-2 | IDF 99-2 for sampling of specific milk and milk products).

The laboratory shall receive a test sample which is truly representative and which has not been damaged or changed during sampling, transport or storage.

Precautions, therefore, shall be taken during sampling, transportation, and storage of the samples so that the sensory properties are not affected by these factors.

8 Preparation of test samples

Prepare test samples for assessment as specified in ISO 22935-2|IDF 99-2 for individual milk and milk products.

During the preparation of test samples, take precautions to ensure that the sensory properties are not affected in an undesired manner.

Arrange the assessment so that the identity of each sample to be assessed is not known to the assessors.

Take precautions to ensure that assessors are not influenced by the size and shape of the samples or by the mode of presentation.

9 Procedures

9.1 Evaluate the overall appearance, the overall consistency, and/or the overall odour/flavour of each test sample separately. See ISO 22935-2|IDF 99-2 for recommended methods for the sensory evaluation of specific milk and milk products.

9.2 In scoring each property, use the numerical discrete interval scale presented in Table 1, which represents the magnitude of the deviation in a product from the pre-established sensory specification.

Table 1 — The numerical discrete interval scale giving the magnitude of deviation in the scoring

Points	Verbal description
5	No deviation from the pre-established sensory specification
4	Minimal deviation from the pre-established sensory specification
3	Noticeable deviation from the pre-established sensory specification
2	Considerable deviation from the pre-established sensory specification
1	Very considerable deviation from the pre-established sensory specification

9.3 Each of the assessors shall score the test samples of a specific milk or milk product in a random order. In regular process or quality control situations (e.g. at processing dairy plants) it is, however, sufficient that the panel as a whole score the test samples of a specific milk or milk product in a random order.

9.4 Serve highly flavoured types of specific milk and milk products and/or products with a high fat content after less highly flavoured products and/or products with lower fat content.

9.5 Adjust the maximum number of test samples for each assessment to the type of product to be assessed, so that the assessment is carried out consistently for each sample. If necessary, carry out the assessment at adequate intervals.

9.6 Present the test samples in such a way that assessors cannot mix them up.

9.7 Instruct assessors to do the technical performance of the sensory evaluation in an appropriate and repeatable way (size of the sample in the mouth, time of chewing, etc.).

9.8 Use a suitable cleanser (e.g. mouth rinse with pure, room temperature water) to prevent carry-over of any stimuli that might affect the score of the next sample.

9.9 In order to adjust and coordinate assessors, assess at least two calibration samples for each type of product and discuss the results obtained before starting the assessment of a product. Preferably, one of the calibration samples shall be expected to conform to the sensory specification (a control sample). Calibration samples shall be available during the assessment.

9.10 Individual assessors shall analyse test samples independently of each other, without intercommunication, and only utilize whole points.

9.11 If an assessor scores a property 3 points or lower, a description of the deviation shall be given. In doing so, the assessor shall use the nomenclature of terms (5.5.3) for the specific milk or milk product and list the terms according to the significance of the magnitude of deviation from the product specification.

9.12 When the scoring by the assessors for a particular property is spread over adjacent points only, the mean value for the panel shall be calculated to one decimal place.

9.13 If the differences between the individual scoring for a property are wider than adjacent points (for example wider than 3 and 4), perform a reassessment of this property. Individual assessors shall reassess independently of each other, preferably without knowing which test sample and property they are reassessing. The results from the reassessment are final and the mean value for the panel shall be calculated to one decimal place based on these results.

9.14 If the mean value for the panel is lower than 3,6 for a property, list the description of the deviation according to the significance of the magnitude of deviation from the product specification. Assessors in the panel may, if necessary, discuss and agree on the terms to be stated.

9.15 The mean value of the panel for each property, supplemented with the representative term(s) when the mean value is lower than 3,6, gives the result of the method.

10 Precision

This part of ISO 22935|IDF 99 gives guidance on a method which shall be supplemented with specific methods for different specific milk and milk products (5.5.1), different product specifications made by different companies, region, countries etc. for different specific markets (5.5.2), and a nomenclature of terms for the specific milk and milk products (5.5.3).

This leads to a very broad range of parameter combinations which have to be covered by a large and very expensive interlaboratory test to give any relevance to precision figures (repeatability and reproducibility) for users of this part of ISO 22935|IDF 99. For that reason, it was not found appropriate to arrange a general interlaboratory test for this method.

Instead it is recommended that different companies, regions, countries, etc. using this method and having specified the above mentioned supplements for their own specific products, arrange an interlaboratory test carried out in accordance with ISO 5725-1 [2] and ISO 5725-2 [3], relevant for their products and their use of the method, to find their own precision figures.

11 Test report

The test report shall contain at least the following information:

a) all information necessary for the complete identification of the test sample;

b) the sampling method used, if known;

c) the test method used, with reference to this part of ISO 22935|IDF 99;

d) all operating details not specified in this part of ISO 22935|IDF 99, or regarded as optional, together with details of any incidents which may have influenced the test result(s) — of special interest are:

   1) the number of assessors,

   2) whether the panel leader participated in the panel as an assessor,

   3) type of product specifications (e.g. company, describing sensory requirements for which market),

   4) whether the identities of the samples were known to the assessors,

   5) whether each of the assessors, or the panel scored the test samples in a random order,

   6) any information and any specific recommendations given to the assessors in connection with the test,

   7) the location, date and name of the panel leader;

e) the test result(s) obtained and, if the repeatability has been checked, the final quoted result obtained as a statement of the estimated uncertainty of measurement;

f) when relevant, any supplementary information given in ISO/IEC 17025.

Bibliography

[1] ISO 707 | IDF 50, *Milk and milk products — Guidance on sampling*

[2] ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

[3] ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

[4] ISO 13299, *Sensory analysis — Methodology — General guidance for establishing a sensory profile*

[5] EA-4/09, *Accreditation for sensory testing laboratories*. Available (2009-01-08) from: http://www.european-accreditation.org

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