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Milk and milk products — Sensory analysis —

Part 1: Recruitment, selection, training and monitoring of assessors

Lait et produits laitiers — Analyse sensorielle —

Partie 1: Recrutement, sélection, entraînement et contrôle des sujets

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Forewords

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

This second edition cancels and replaces the first edition (ISO 22935-1 | IDF 99-1:2009), which has been technically revised.

The main changes are as follows:

— the Normative references have been updated;

— a few changes have been made to reference materials.

A list of all parts in the ISO 22935 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

IDF (the International Dairy Federation) is a non-profit private sector organization representing the interests of various stakeholders in dairying at the global level. IDF members are organized in National Committees, which are national associations composed of representatives of dairy-related national interest groups including dairy farmers, dairy processing industry, dairy suppliers, academics and governments/food control authorities.

ISO and IDF collaborate closely on all matters of standardization relating to methods of analysis and sampling for milk and milk products. Since 2001, ISO and IDF jointly publish their International Standards using the logos and reference numbers of both organizations.

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This document was prepared by the IDF *Standing Committee on Statistics and Automation* and ISO Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products.* It is being published jointly by ISO and IDF.

The work was carried out by the IDF/ISO Action Team S17 of the *Standing Committee on Statistics and Automation* under the aegis of its project leader Dr H. Kraggerud (NO).

Introduction

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

To achieve that, the ISO 22935 | IDF 99 series is divided into three parts.

ISO 6658 should be consulted for an overview of sensory methods other than the one provided in ISO 22935-3 | IDF 99-3.

The principles described are largely derived from various International Standards on the topic.

It is important that safety issues are handled during sensory evaluations (see ISO 20613).

Milk and milk products — Sensory analysis —

Part 1: Recruitment, selection, training and monitoring of assessors

1 Scope

This document gives general guidance for the recruitment, selection, training, and monitoring of assessors for sensory analysis of milk and milk products.

It specifies criteria for the selection, and procedures for the training and monitoring, of selected assessors and expert sensory assessors for milk and milk products. It supplements the information given in ISO 8586 that deals with expert assessors.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4120, *Sensory analysis — Methodology — Triangle test*

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 8586:2012, *Sensory analysis — General guidelines for the selection, training and monitoring of selected assessors and expert sensory assessors*

ISO 8587, *Sensory analysis — Methodology — Ranking*

ISO 8589, *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 4121, ISO 5492, ISO 5496, ISO 6658, ISO 8586 and ISO 8589 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
sensory analysis
science involved with the assessment of the sensory attributes of a product by the senses

[SOURCE: ISO 5492:2008, 1.1, modified — "sensory" replaced "organoleptic" in the definition.]

3.2
expert sensory assessor
selected assessor with a demonstrated sensory sensitivity and with considerable training and experience in sensory testing, who is able to make consistent and repeatable sensory assessments of various products

Note 1 to entry: Examples of "various products" are "dairy products".

[SOURCE: ISO 5492:2008, 1.8, modified — Note 1 to entry added.]

3.3
appearance
all the visible attributes of a substance or object

Note 1 to entry: For a dairy product, the visual attributes are both internal and external, and include shape, colour, loose liquid, phase separation, wanted or unwanted particles, and openings.

[SOURCE: ISO 5492:2008, 3.1, modified — Note 1 to entry added.]

3.4
fingerfeel
mixed experience derived from sensations on the fingers that relate to physical properties of a stimulus

3.5
flavour
complex combination of the olfactory, gustatory and trigeminal sensations perceived during tasting

[SOURCE: ISO 5492:2008, 3.20, modified — Note 1 to entry deleted.]

4 Recruitment

Assessors can be recruited from within a company (laboratory staff, production staff, administration staff, etc.), who are not involved with project work, or from outside a company. Outside assessors can be recruited by advertisement or by word of mouth. The panel candidates should have an understanding of the amount of time that will be required for the screening process and for actual panel work. A large enough pool of available candidates should be screened in order to have enough assessors available to select from when forming a panel. The trainee assessor should have satisfactory personal qualifications for assessments and should be pre-selected by:

a) the use of screening tests to assess the ability of candidates to perceive, discriminate and describe sensory attributes;

b) a general understanding of the concepts of sensory evaluation;

c) a general liking or interest in dairy products.

5 Screening

5.1 Screening form and requirements

Potential applicants should go through two forms of screening via an interview and sensory screening tests. During the interview, the applicants should fill out a pre-screening form which indicates the times that they are available for panels and any health issues they can have, e.g. arthritis which can interfere

with the evaluation of product texture in-hand (fingerfeel), lactose intolerance, food allergies, wearing of dentures, smoking status, and any other issues of concern.

Flavoured water solutions and dairy products should be used to indicate if the potential assessor can recognize specific tastes or flavours at different intensities. The potential evaluator shall be able to detect certain flavours within complex dairy products. The following three sessions each take assessors approximately 45 min to 1 h to complete. These screening exercises are suggestions only and may be adapted to the application area of the assessors. The sessions described in Tables 1 to 3 may be broken down into smaller or larger sessions depending on how much time is available.

Table 1 — Session 1 — Basic odour and taste recognition

Test	Reference	Result
1	5.3.2	Odour recognition
2	5.3.3	Basic taste recognition
3	5.3.4, Table 8	Ranking of basic taste — sweet
4	5.3.4, Table 9	Ranking of basic taste — sour
5	5.3.4, Table 10	Ranking of basic taste — salty
6	5.3.4, Table 11	Ranking of basic taste — bitter

Table 2 — Session 2 — Milk powder and cream products

Test	Reference	Result
7	5.3.5, Table 14	Triangle test — milk powder
8	5.3.5, Table 15	Triangle test — butter
9	5.3.5, Table 16	Triangle test — salted butter
10	5.3.6.3	Round table discussion — cream evaluation
11	5.3.4, Table 12	Ranking of texture — body/creaminess
12	5.3.5, Table 13	Triangle test — aged milk powder

Table 3 — Session 3 — Cheese

Test	Reference	Result
13	5.3.5, Table 16	Triangle test — cheese
14	5.3.6.2	Round table discussion — cheese evaluation
15	5.3.5, Table 16	Triangle test — bitter cheese
16	5.3.5, Table 17	Triangle test — cheese firmness
17	5.3.5, Table 17	Triangle test — cheese smoothness

Mark each section as per each marking schedule. Other examples of screening exercises can be found in ISO 8586.

5.2 Preparation of test samples for screening

5.2.1 If possible, prepare test samples on the day of the evaluation.

5.2.2 For screening purposes, it is easier to serve test samples in the same order to all assessors.

5.2.3 If appropriate, use test sample questionnaires for all screening exercises found in ISO 4120 (triangle test), ISO 8587 (ranking test), ISO 6658 and ISO 4121 (scales).

5.3 Screening tests, materials and methods

5.3.1 General

The screening tests, materials and methods presented in this clause are recommendations only. They can be adapted to suit the needs of an individual company.

5.3.2 Odour recognition

Follow the instructions outlined in ISO 8586:2012, 5.4.1, for details on how to prepare the test samples and conduct this test. Table 4 suggests other aromas that can be used.

Table 4 — Examples of olfactory materials for odour description test

Blind code (example)	Sample preparation
981	Citronella oil (lemon, cleaning fluid)
194	Orange
229	Caramel
371	Butyric acid
926	Acetic acid
174	Ammonia
746	(*Z*)-hex-3-en-1-ol[a]
831	Oct-1-en-3-ol
556	Vanilla

[a] In older literature, known as *cis*-hex-3-en-1-ol.

Candidates are graded according to performance, as shown in Table 5. For each sample, a total of three points can be achieved. If the assessor uses words other than those listed in Table 5, score appropriately.

Table 5 — Marking schedule for odour recognition

Sample	Correct answer		
	3 points	2 points	1 point
Citronella oil	Citronella oil	Lemony, cleaning fluid	Citrus, fruity
Orange	Orange	Lemon	Citrus, fruity
Caramel	Caramel	Vanilla, malt, toasted	Sweet
Butyric acid	Rancid butter	Parmesan cheese	Vomit, baby burp
Acetic acid	Acetic acid	Vinegar	Sour/off milk
Ammonia	Ammonia	Cleaning fluid, urine	Pungent
(*Z*)-hex-3-en-1-ol	Green grass	Green beans	Green vegetable
Oct-1-en-3-ol	Mushroom	Cellar, musty	Mouldy
Vanilla	Vanilla	Custard, dessert	Sweets, candy

5.3.3 Basic taste recognition

The solutions can be prepared as shown in Table 6. Present the solutions to the assessors in the same order, and one of the solutions twice. Ask the assessor to identify the basic taste that is represented by the solution.

Table 6 — Basic taste solutions

Blind code (examples)	Answer	Concentration	Sample preparation
683	Sweet	10 g/l sucrose (1 % mass fraction)	10 g sucrose + 1 l water
429	Salty	2 g/l NaCl (0,2 % mass fraction)	2 g NaCl + 1 l water
662	Sour	0,3 g/l citric acid (0,03 % mass fraction)	0,3 g citric acid + 1 l water
353	Bitter	0,3 g/l caffeine (0,03 % mass fraction)	0,3 g caffeine + 1 l water
768	Umami (optional)	0,6 g/l monosodium glutamate (0,06 % mass fraction)	0,6 g monosodium glutamate or 0,18 g umami mixture (50 % mass fraction monosodium glutamate, 25 % mass fraction 5′- guanylic acid, 25 % mass fraction inosinic acid) + 1 l water with 0,5 g NaCl
418	Water		water

Candidates are graded according to performance on the scale shown in Table 7.

Table 7 — Gradation scale I

Points	Result
6	all correct
5	five correct
4	four correct
3	three correct
2	two correct
1	one correct
0	none correct

5.3.4 Ranking tests

A minimum of four test samples should be ranked in order of increasing intensity. This test will indicate whether the assessor can tell the difference between samples for certain basic tastes.

Samples for ranking of sweetness, sourness, saltiness, bitterness and creamy flavour are given in Tables 8, 9, 10, 11 and 12, respectively.

This test can also indicate the threshold levels of assessors (i.e. if the assessor did not correctly identify the order of the lower intensities, that would indicate that this assessor cannot taste at lower levels for this particular attribute).

NOTE All samples are randomized, but are presented to all the assessors in the same order.

Table 8 — Sweet ranking

Blind code (examples)	Correct ranking	Concentration	Sample preparation
478	3	10 g/l sucrose (1 % mass per volume)	10 g sucrose + 1 l water
753	1	Water	Water
578	4	15 g/l sucrose (1,5 % mass per volume)	15 g sucrose + 1 l water
248	2	5 g/l sucrose (0,5 % mass per volume)	5 g sucrose + 1 l water

Table 9 — Sour ranking

Blind code (examples)	Correct ranking	Concentration	Sample preparation
145	2	0,10 g/l citric acid (0,01 % mass per volume)	0,10 g citric acid + 1 l water
249	4	0,5 g/l citric acid (0,05 % mass per volume)	0,5 g citric acid + 1 l water
871	1	Water	Water
675	3	0,3 g/l citric acid (0,03 % mass per volume)	0,3 g citric acid + 1 l water

Table 10 — Salt ranking

Blind code (examples)	Correct ranking	Concentration	Sample preparation
985	2	1 g/l NaCl (0,1 % mass per volume)	1 g NaCl + 1 l water
813	1	Water	Water
713	4	2 g/l NaCl (0,2 % mass per volume)	2 g NaCl + 1 l water
632	3	1,5 g/l NaCl (0,15 % mass per volume)	1,5 g NaCl + 1 l water

Table 11 — Bitter ranking

Blind code (examples)	Correct ranking	Concentration	Sample preparation
268	2	0,1 g/l caffeine (0,01 % mass per volume)	0,1 g caffeine + 1 l water
634	1	Water	Water
919	4	0,5 g/l caffeine (0,05 % mass per volume)	0,5 g caffeine + 1 l water
752	3	0,3 g/l caffeine (0,03 % mass per volume)	0,3 g caffeine + 1 l water

Table 12 — Creamy flavour ranking

Blind code (examples)	Correct ranking	Sample preparation
268	1	Ultra high temperature (UHT) non-fat
634	4	UHT full fat + 20 % volume fraction UHT cream
919	3	UHT full fat + 3 % volume fraction UHT cream
752	2	UHT full fat

Candidates are graded according to performance on the scale shown in Table 13.

Table 13 — Gradation scale II

Points	Result
4	Four correct
3	Adjacent switch
1	One correct
0	None correct

5.3.5 Difference testing

Difference testing indicates if the individual can detect small differences between samples for certain flavours or textures.

The test samples should be selected so that they test the capability of the assessor to discriminate between the samples based only on flavour or texture. An expert assessor can be used to select the samples to be used in the tests. Examples of samples for difference testing are listed in Table 14 to Table 17.

"Paired comparison" or "triangle" testing should be conducted on a series of products. If the assessor thinks the samples are different, they can be asked to indicate what the difference is. This indicates if assessors can accurately identify differences between products and name the difference.

All test samples are to be presented to all assessors in the same randomized order.

It is recommended that each set of samples be presented to the assessors twice to check if assessors can replicate their results.

Table 14 — Suggested milk powder samples for difference testing — Flavour

Product	Blind code (examples)	Answer	Sample preparation (30 g per assessor) 100 % mass fraction
Milk powder sample set No. 1	737		Skim milk powder
	932		Skim milk powder
	895	Different	Whole milk powder
Milk powder sample set No. 2	769		Skim milk powder
	862	Different	Whole milk powder
	374		Skim milk powder
Aged milk powder sample set No. 1	191	Different	Oxidized milk powder[a]
	748		Fresh milk powder
	651		Fresh milk powder
Aged milk powder sample set No. 2	426		Fresh milk powder
	621		Fresh milk powder
	848	Different	Oxidized milk powder[a]

[a] Refer to Table 28 for instructions on preparing oxidized milk samples.

Table 15 — Suggested butter samples for difference testing — Flavour

Product	Blind code (examples)	Answer	Sample preparation (1 cube per assessor)
Butter sample set No. 1[a]	148		Butter type 1
	897		Butter type 1
	198	Different	Butter type 2
Butter sample set No. 2[a]	539		Butter type 1
	575	Different	Butter type 2
	272		Butter type 1
Salted butter sample set No. 1	514		Unsalted butter
	796		Unsalted butter
	244	Different	Salted butter
Salted butter sample set No. 2	868		Unsalted butter
	364		Unsalted butter
	968	Different	Salted butter

[a] The butters used in this test can be two different brands of butter, butter with known flavour differences or "spiked" butter samples [e.g. regular butter and a grassy butter (butter with 1,5 % mass fraction hexanal)].

Table 16 — Suggested cheese samples for difference testing — Flavour

Product	Blind code (examples)	Answer	Sample preparation (30 g per assessor)
Cheese sample set No. 1	345	Different	Cheese type 1
	223		Cheese type 2
	466		Cheese type 1
Cheese sample set No. 2[a]	342		Cheese type 1
	555		Cheese type 1
	314	Different	Cheese type 2
Bitter cheese sample set No. 1	871		Non-bitter cheese
	914		Non-bitter cheese
	557	Different	Bitter cheese
Bitter cheese sample set No. 2	997		Non-bitter cheese
	663	Different	Bitter cheese
	783		Non-bitter cheese

[a] The cheese samples used in this test can be collected from two different brands of cheese or cheeses with known flavour differences.

Table 17 — Suggested cheese samples for difference testing — Texture

Product	Blind code (examples)	Answer	Sample preparation
Cheese — firmness sample set No. 1	278		Cheese firmness — brand 1
	921	Different	Cheese firmness — brand 2
	461		Cheese firmness — brand 1
Cheese — firmness sample set No. 2	476	Different	Cheese firmness — brand 2
	133		Cheese firmness — brand 1
	931		Cheese firmness — brand 1
Cheese — smoothness sample set No. 1	119	Different	Cheese smoothness — brand 1
	346		Cheese smoothness — brand 2
	278		Cheese smoothness — brand 2
Cheese — smoothness sample set No. 2	563		Cheese smoothness — brand 2
	572	Different	Cheese smoothness — brand 1
	588		Cheese smoothness — brand 2

Candidates are graded according to performance on scale III (see Table 18).

Table 18 — Gradation scale III

Points	Result
6	Correct response for both sample set #1 and sample set #2
4	Correct response for either sample set #1 or sample set #2
0	Incorrect response for both sample set #1 and sample set #2
0,5	Correct description of difference

5.3.6 Descriptive ability and group discussion

5.3.6.1 General

During a group discussion, the candidates taste a product and generate descriptive terms for that product by themselves. The candidates discuss their result with the other assessors (minimum of eight in a group). This indicates if a candidate can break a product down into descriptive terms and how the candidate interacts within group discussions.

Choose two types of dairy products for the descriptive discussion groups. This document gives examples for cheese and cream samples; other samples can be selected depending on the types of products that are commonly evaluated by panels. Ask the candidates to evaluate the samples presented and write down all the descriptive words they can think of for the odour, texture and flavour of the products. Once the evaluation has been conducted, get the group to discuss the samples and their differences.

5.3.6.2 Cheese

Samples are proposed in Table 19.

Table 19 — Suggested cheese samples for discussion groups

Blind code (examples)	Sample preparation
524	Mild Cheddar cheese
831	Blue vein cheese

Candidates are graded according to performance on scale IV (see Table 20). Check all the descriptors that the candidates generated and give them appropriate marks based on how many descriptors they generated and how accurately they described the samples.

Table 20 — Gradation scale IV

Points	Result
1 (max. of 1)	1 point for each correct odour comment to a maximum of 1 point
1 (max. of 2)	1 point for each correct texture comment to a maximum of 2 points
1 (max. of 4)	1 point for each correct flavour comment to a maximum of 4 points

If candidates use words other than those listed in Table 21, score appropriately.

For the discussion, mark each individual out of 10 (10 being the best score) on how they contributed to the group discussion and how well the individual can convey what they are saying.

Table 21 — Suggested odour, texture and flavour descriptions for mild Cheddar and blue vein cheeses

Product	Odour	Texture	Flavour
Mild Cheddar	Cheesy	Firm Hard Dry	Salty Creamy Cheesy Sharp
Blue vein	Sharp Acidic Vomit Mouldy	Crumbly Moist Lumpy	Salty Sharp Vomit Mushroom Mouldy

5.3.6.3 Cream

Samples are proposed in Table 22.

Table 22 — Suggested cream samples for discussion groups

Blind code (examples)	Sample preparation
967	Full cream (whipped until peaks are formed)
491	Aerosol cream

Candidates are graded according to performance on scale V (see Table 23). Check all the descriptors that the candidates generated and give them appropriate marks based on how many descriptors they generated and how accurately they described the samples.

Table 23 — Gradation scale V

Points	Result
1 (max. of 1)	1 point for each correct odour comment to a maximum of 1 point
1 (max. of 2)	1 point for each correct texture comment to a maximum of 2 points
1 (max. of 3)	1 point for each correct flavour comment to a maximum of 3 points

If candidates use words other than those listed in Table 24, score appropriately.

For the discussion: mark each individual out of 10 (10 being the best score) on how they contributed to the group discussion and how well the individual can convey what they are saying.

Table 24 — Suggested odour, texture and flavour descriptions for whipped full cream and aerosol cream

Product	Odour	Texture	Flavour
Whipped full cream	Milky Creamy	Thick Heavy	Buttery Unsweetened Creamy
Aerosol cream	Milky Creamy	Light Fluffy Aerated/foamy Soft	Vanilla Sweet Creamy

5.3.7 Marking schedule summary

The marking schedule in Table 25 is an example based on the guidelines in 5.3.

Table 25 — Marking schedule for all tests

Test no.	Subclause	Table	Title	Maximum score possible
1	5.3.2		Odour recognition	27
2	5.3.3		Basic taste recognition	6
3	5.3.4	Tables 8, 9, 10, 11	Ranking of basic taste	16
4	5.3.4	Table 12	Ranking of texture — body/creaminess	4
5	5.3.6.2		Descriptive cheese evaluation	7
6	5.3.6.2		Round table discussion — cheese evaluation	10
7	5.3.5	Tables 14, 15, 16	Triangle test — flavour	36
8	5.3.5	Table 17	Triangle test — texture	12
9	5.3.6.3		Descriptive cream evaluation	6
10	5.3.6.3		Round table discussion — cream evaluation	10

6 Selection

Requirements and guidelines for selection of panel members according to the marking schedule in 5.3.7 are listed in Table 26 and as follows:

a) adequate completion of the pre-screening questionnaire;

b) overall score of 65 % or greater in a combination of the odour recognition, basic taste recognition, ranking of basic taste, and ranking of texture — body/creaminess tests;

c) overall score of 50 % or greater for the descriptive tests;

d) panel members shall receive a discussion performance score of 5 or better;

e) panel members shall obtain correct scores in at least 65 % of the triangle tests;

f) candidates who achieve less than 65 % of the total score are unsuitable as sensory evaluators.

Table 26 — Suggested test scores for panellist selection

Test no.	Title	Maximum score possible	Recommended pass mark	Pass score
1+2+3+4	Recognition and ranking tests	57	65 %	> 38/57
5+9	Descriptive tests	13	50 %	> 7/13
6	Round table discussion — cheese evaluation	10	5	> 5/10
10	Round table discussion — cream evaluation	10	5	> 5/10
7+8	Triangle test — flavour and texture	42	65 %	> 28/42

The following factors should also be considered when selecting panel members:

— motivation, enthusiasm, positive attitude;

— provision of regular constructive feedback on performance;

— good descriptive ability;

— reliable sensory acuity;

— good general health, no allergies to dairy products;

— ability to attend at least 80 % of training and evaluation sessions;

— excellent communication skills (especially verbal).

Other important characteristics to look for in screening are how well the potential panel members can participate in a group. It is not desirable to have people that are:

— very outspoken and opinionated;

— very quiet and withdrawn;

— argumentative.

Ideally, assessors should be able to put forward an opinion when requested and listen to other ideas with an open mind.

7 Requirements for assessors in the panel

The number of assessors on a panel depends on the type and the objective of the evaluation being conducted (e.g. quality control, grading or research).

At least the following factors should be taken into consideration for optimum performance of assessors before product testing occurs:

a) The assessor should not be suffering from any illness which can affect their performance. Under such circumstances another assessor should join the panel.

b) The assessors should be in time for the assessment and make sure they have spared enough time for the assessment.

c) The assessors should not use any perfume at all, nor any aftershave, scented deodorant or hand lotion, nor eat highly flavoured/spiced food (prior to testing), etc.

d) The assessors should not smoke, eat or drink anything other than water during the last 30 min before the assessment.

8 Training and monitoring of assessors for dairy products

8.1 General

Training shall be ongoing and general training sessions should be held on a regular basis. The training sessions should be a key component of the monitoring programme. Refer to ISO 8586 for further information on panel training.

The trainee should not be accepted as a selected assessor or expert sensory assessor of dairy products before the person is able to reach results that are sufficiently in accordance with the results of a sensory panel of experienced assessors. The trainee should be able to duplicate the scores and the use of nomenclature.

The initial training programme should contain the following elements:

a) theory about factors of practical importance for sensory evaluation;

b) general training on methods, scales and description of sensory attributes;

c) general training on detection and recognition of sensory attributes and specific sensory terms;

d) general training on how dairy products are manufactured and the importance of sensory evaluation for dairy products;

e) thorough training in sensory evaluation of the dairy products to be evaluated;

f) validated references that help the assessor identify specific flavours and intensities within a product.

8.2 References

References are recommended for the training of the more common flavour attributes within dairy products. The flavour attributes can be generated by the panel for each product or selected by the panel leader. If possible, food grade chemicals can be used in solution or added to specific dairy products so that the assessor understands how that flavour relates to the actual product characteristics. The training references depend on the type of evaluation being done (quality scoring or profiling).

Reference material based on toxic chemicals shall only be tested by smelling (odour samples). Refer to material safety sheets. Testing should be done on the basic tastes (sweet, sour, bitter, salt, umami) as shown in Table 27 and selected dairy attributes. All training references should be assessed at the same temperature as the dairy products.

Examples of references that can be used to train assessors to recognize some of the specific dairy product attributes can be found in Table 28.

Table 27 — Training references for basic tastes

Basic taste	Reference product	Concentration	Preparation comments[a]
Sour	Lactic or citric acid	0,3 g/l (0,03 % mass per volume)	0,3 g lactic acid + 1 l water 0,3 g citric acid + 1 l water
Bitter	Caffeine	0,3 g/l (0,03 % mass per volume)	0,3 g caffeine + 1 l water
Salty	Sodium chloride	2,0 g/l (0,2 % mass per volume)	2,0 g NaCl + 1 l water
Sweet	Sucrose	10 g/l (1 % mass per volume)	10 g sucrose + 1 l water
Umami	Monosodium glutamate (MSG)	0,6 g/l (0,06 % mass per volume)	0,6 g $C_5H_8NNaO_4$ + 1 l water

[a] These are suggested concentrations only. Concentrations can vary depending on the products being evaluated.

Table 28 — Suggested training references for selected milk and milk product attributes

Attribute	Reference product	Preparation
Acetic	Wine vinegar	
Ammonia	Ammonium hydroxide solution	1 ml of NH_4OH at 25 % mass fraction in 500 ml water (aroma only).
Astringent	Tea	Soak 6 black tea bags (2,5 g each) in 500 ml water at 80 °C for 10 min (see Reference [6]).
Astringent	Tannic acid	100 mg of tannic acid powder per 100 ml water.
Apricot	Mature apricot	
Barny/cowy	*p*-cresol	20 mg/kg *p*-cresol in skim milk (see Reference [6]).
Butyric	Butyric acid	Add 20 mg/kg of butyric acid to 95 % volume fraction ethanol (see Reference [5]) or 0,1 g/l water (see Reference [8]).
Burnt	Over-toasted bread slice	Grill bread until the appearance of black carbonized areas. Crumble these areas before presenting them.
Burnt	Milk	Pour 50 ml of milk into a pot until the bottom of the pot is just covered. Cook on high heat until the milk starts to burn and most of the liquid has evaporated (approximately 2 min). Remove pot from heat. Add 450 ml of uncooked milk. Sieve and pour into a container.

NOTE Some concentrations have not been recommended, as concentrations for certain references can vary between products and countries.

[a] In older literature, known as *trans,trans*-deca-2,4-dienal.