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## Sensory analysis — Methodology — General guidance for conducting hedonic tests with consumers in an controlled area

*Analyse sensorielle — Méthodologie — Lignes directrices générales pour la réalisation d'épreuves hédoniques effectuées avec des consommateurs dans un espace contrôlé*

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## Foreword

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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.

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ISO 11136 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 12, *Sensorial analysis*.

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

# Sensory analysis — Methodology — General guidance for conducting hedonic tests with consumers in an controlled area

## 1 Scope

This document describes approaches for measuring, within a controlled area, the liking or relative liking of consumers for products.

It concerns tests based on collecting assessors' responses to questions, generally on paper or via a keyboard or a touch screen. Tests of a behavioural nature (such as recording quantities consumed ad libitum by the assessors) do not fall within the scope of this document.

The hedonic tests dealt with in this document can be used as a contribution to :

- comparing a product with competitor products;
- optimising a product so that it obtains a high hedonic rating or is liked by a large number of consumers;
- helping to define a range of products to correspond to a particular consumer target population;
- helping to define a best-before date;
- assessing the impact of a product formulation change on the pleasure given by the product;
- studying the impact of sensory characteristics of a product on degree of liking, independently of the product's extrinsic characteristics such as brand, price or advertising;
- studying the effect of a commercial or presentation variable such as packaging.

The methods are effective for determining:

- whether a perceptible preference exists (difference of liking); or
- whether no perceptible p exists (paired similarity test).

## 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 5495, Sensory analysis — Methodology — Paired comparison test.

ISO 8587, Sensory analysis — Methodology — Ranking.

ISO 20252, Market, opinion and social research - Vocabulary and service requirements.

ISO 29842, Sensory analysis — Methodology — Balanced incomplete block designs.

## 3 Terms and definitions

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

### 3.1

#### **closed-ended question**

question requiring respondents to select from a predetermined list of possible answers

### 3.2

#### **commissioning party**

any person, body or service who commissions a third party to conduct a study

Note 1 to the clause The concept of commissioning party corresponds to that of purchaser or customer in quality control. It contrasts with that of supplier, service provider or laboratory.

Note 2 to the clause Usually, the commissioning party and the service provider belong to different enterprises. When they belong to two departments of the same enterprise, the respective responsibilities of the two departments shall be carefully differentiated and explicitly clarified in the study proposal.

### 3.3

#### **consumer (or assessor, or respondent)**

person who uses a product

Note 1 to the clause For the purpose of this standard, the meaning is restricted to a person who is not an expert, an expert assessor or a specialised expert assessor within the meaning of ISO 5492, nor a trained assessor within the meaning of ISO 11035

### 3.4

#### **consumer pool to search a new definition to clarify (see ISO 20252 on market opinion)**

#### **panel, notion of repetitivity, sample**

#### **Sensory panel vs market research definition..etc**

households or individuals forming a collection of persons from whom consumer samples can be drawn on a more or less regular basis

### 3.5

#### **consumer sample**

group of consumers recruited on the basis of criteria specified by the nature of the target population

**3.6****controlled area**

a location providing:

- controlled preparation and presentation of the products;
- comfortable conditions for consuming the products and for questioning the assessors;
- absence of communication (verbal and non-verbal) between the assessors, guaranteeing independent responses.

**3.7****hedonic perception**

amount of pleasure given by the sensory properties of a product

**3.8****hedonic test**

test aimed at measuring the overall hedonic perception of a product by consumers

**3.9****open-ended question**

question that does not provide ready-made alternatives for respondents but asks them to answer in their own words

Note 1 to the clause It can concern each of the products presented to the assessors or only some of them (e.g., when it asks why a particular product has appealed most, or least, to an assessor).

**3.10****position bias**

bias related to the spatial location of a product in a set of products being evaluated

**3.11****product family**

group of products which can replace one another under normal conditions of consumption; product families may vary according to culture and consumption habits

**3.12****representativeness (of a sample)**

the degree to which attributes of the sample agree with relevant attributes of the population it is drawn from

**3.13****sequential bias**

bias related to the temporal or sequential position of a product in a set of products being evaluated

**3.14****session**

meeting of assessors working simultaneously according to the same protocol during a defined time period

Note 1 to the clause A session can be divided into several sub-sessions separated by a defined rest time. For example, a session lasting 1 h 30 can be divided into two sub-sessions with a 10 minute break between them.

**3.15****target population**

population whose hedonic response to a product is to be evaluated

## 4 Preliminary considerations

### 4.1 Study proposal

The study proposal is drawn up by the service-providing laboratory as a written document that binds the laboratory and the commissioning party contractually. It includes the following elements:

- the objective of the study;
- the products to be evaluated (and the procedures for their procurement, especially when the laboratory has to procure one or more products);
- the target population for the study;
- the size of the consumer sample and the way it is to be recruited;
- any limitations on assessors' prior history of participation in consumer studies;
- any limitations on other products to be evaluated in the same testing session;
- the evaluation conditions:
- The type of interview (self-completion forms or interviewers);
- the questionnaire;
- the place of evaluation;
- the number of products to be evaluated per session in the proposed study together with an indication of other products to be evaluated where the session comprises several product families (where these products are not known at the time of drawing up the proposal, the laboratory is committed to communicate them as soon as it knows them);
- the conditions of preparation specific to the products to be evaluated (if they are known at this stage);
- any instructions specific to the products to be evaluated (if they are known at this stage) together with any specific information to be given about the products or the test at the start of the session;
- the name of the statistical tests to be used for interpreting the results; the type of risks used and their tolerable values; the magnitude of the minimum difference to be detected in a difference of liking test or of the maximum tolerable difference in a similarity of liking test;
- any envisaged segmentation of the consumer population, based either on attributes known before obtaining judgment data or from the responses obtained;
- the method of examining and summarising open-ended questions;
- any recommendations the commissioning party wishes the laboratory to draft on the basis of the results;
- the dates envisaged for the tests and for submission of the report.

When any of the above elements are unknown at the time of the study proposal, the proposal includes for each element concerned the following statement: "This element will be specified by the commissioning party by... [specifying the stage of the study]."

**NOTE** If a specification already exists, the study proposal may make reference to it without repeating technical points described in an operational manner in the specification.

## 4.2 Specification of the target population

Before performing hedonic tests, at least the following questions should be considered because the specification of the target population depends on the answers. The questions shall be considered for each test to be performed because the consumer target group can be different from one test to the next, even for the same product.

- Has the product to be tested already been introduced on the market? If so, is it possible to distinguish between actual and potential consumers?
- Are the consumers of interest those who actually use the product, potential consumers who have not been using the product or both groups?
- Are results from specified subgroups to be examined and compared?
- Are the results of the total consumer sample to be analysed with a view identifying subgroups?
- Are differences between the results of individuals of interest?

## 4.3 Further specifications

Subsequent to specifying the target population, the following aspects shall be specified:

- place of test (see Clause 6);
- expected precision of measurement (see Clause 10);
- test method (see Clause 8);
- product presentation plan for the test methods selected (see Clause 9);
- Specifications for the hypothesis to be tested (see Clause 11);

For the hypothesis to be tested the following aspects shall then be specified:

- the composition of the consumer sample (see Clause 5);
- the size of the consumer sample (see Clause 10).

# 5 The consumer sample

## 5.1 General

A hedonic test aims to determine the acceptability of the products and/or to determine preferences among two or more products by the specified consumer population.

The composition of the consumer sample is decisive for any hedonic test as regards whether or not the result can answer the questions of interest to the commissioning party.

The consumers shall be volunteers, which does not imply that it is not permitted for them to receive expenses or a reward for participation.

It is essential to obtain spontaneous reactions.

Trained assessors shall be excluded from these tests since they are likely to differ systematically from the target population.

It is usually inadvisable to recruit a consumer sample from the personnel of a company manufacturing the products to be tested. The factors most likely to distort the results when an in-house consumer panel is used are:

- a risk of the products to be tested being recognised;
- a tendency to judge in favour of the recognised products;
- excessive familiarity with the products;

These factors carry a serious risk of the results not being representative for the target population of consumers.

Any criteria to be followed when selecting the consumers (e.g. whether or not they may be recruited from the staff of the manufacturing company or its competitors or from a particular socio-economic sector) shall be agreed with the client ordering the test irrespective of the recruiting method used.

## 5.2 Recruiting the consumers

### WARNING

- **Confidentiality shall be observed and relevant legislation shall be complied with when creating and documenting files containing personal data.**
- **Legislation with respect to age restrictions shall be adhered to.**

Assessors may be recruited either on a task-specific basis (where consumers are freshly recruited for a particular study) or from a consumer pool (a list of potential assessors having known characteristics). Task-specific recruitment has often been considered a means of recruiting assessors who have not participated much in consumer studies but this idea may have become erroneous with the multiplication of locations where hedonic tests are organised in a quasi-permanent manner.

### 5.2.1 Task-specific recruitment

Task-specific recruitment may be conducted in a public place, at a sales point, by telephone, by mail or electronic mail or by advertisement in a local newspaper or radio station. In many cases it is necessary to reach a prior agreement with the corporation or organisation responsible for the area in which the recruitment occurs.

The manner of recruiting and the time of approaching the consumers (in particular when making contact at public places or by phone and when distributing information through the media) can have a strong effect on the composition of the consumer sample.