

# Sensory analysis, the different methods and how it is used

**Amar Aouzelleg**

# Content

1. Sensory evaluation – a scientific discipline
2. Human senses in action
3. The sensory panel – recruitment and screening
4. Control of sensory facilities, samples and panels
5. Sensory tests and their uses

# 1. Sensory Evaluation

# Definition

Sensory evaluation is a 'scientific discipline used to evoke, measure, analyse and interpret reactions to those characteristics of foods and other materials as they are perceived by the senses of sight, smell, taste, touch and hearing'.

# Use of human subjects in sensory evaluation

- People are consumers (can be used in **subjective consumer tests**)
- They give rapid response that is easy to interpret
- They provide qualitative and quantitative information
- They can be trained (for **objective product orientated tests**) and used as analytical instruments

## 2. Human Senses in Action

# The main sensory perceptions

- **Appearance**
  - colour, shape, size, surface texture, brightness
- **Odour**
  - smell, aroma
- **Taste**
  - the basic tastes
- **Flavour**
  - taste, aroma and trigeminal response
- **Texture**
  - body, mouth feel, hardness/softness. the brighter choice

# Flavour

The combination of taste, aroma and trigeminal response is often described as 'flavour'.



# Trigeminal response

- caused by irritating chemicals e.g. CO<sub>2</sub> in fizzy drinks
- can be either hot, burning, cooling, tingling/pain or astringent sensations
- occurs in mucus membranes of eyes, nose and mouth
- other examples of irritating chemicals: e.g. in chilli pepper

# 3. The Sensory Panel

# Recruitment considerations

- types of **tests** to be conducted
- the **number of sessions** per day / week
- the **number of panel** needed
- **internal or external** assessors

# Assessor screening criterion 1

- no sensory impairments
- 'normal' sensory acuity
- suitable personality traits
- willingness to assess 'unusual' products

# Assessor screening criterion 2

- personal habits – be prepared not to smoke, use odorous cosmetics/soap, eat strong foods before tests
- good general health (no allergies/food intolerances)
- no availability/long-term commitment issues

# Panel training

- increase knowledge of **product and test method**
- **nature/amount of training** relevant to type of test or product under investigation

# 4. Control of Sensory Facilities, Samples and Panel

# Reasons for controlling facilities and procedures

- to minimise **sources of bias**
- to reduce **variability** of response between assessors
- to promote a **professional approach** to sensory evaluation within the organisation and to the assessors



# Design of sensory facilities

- controlled **lighting**/colour; adequate illumination
- controlled **air** circulation, odour extraction
- controlled **temperature**
- quiet, **undisturbed area**
- adequate cooking / sample **preparation** area
- odour-free easy-clean **materials** and implements
- **booths** for separation of assessors
- computers or paper **data capture**

# Panel booths

with separate sections for each assessor

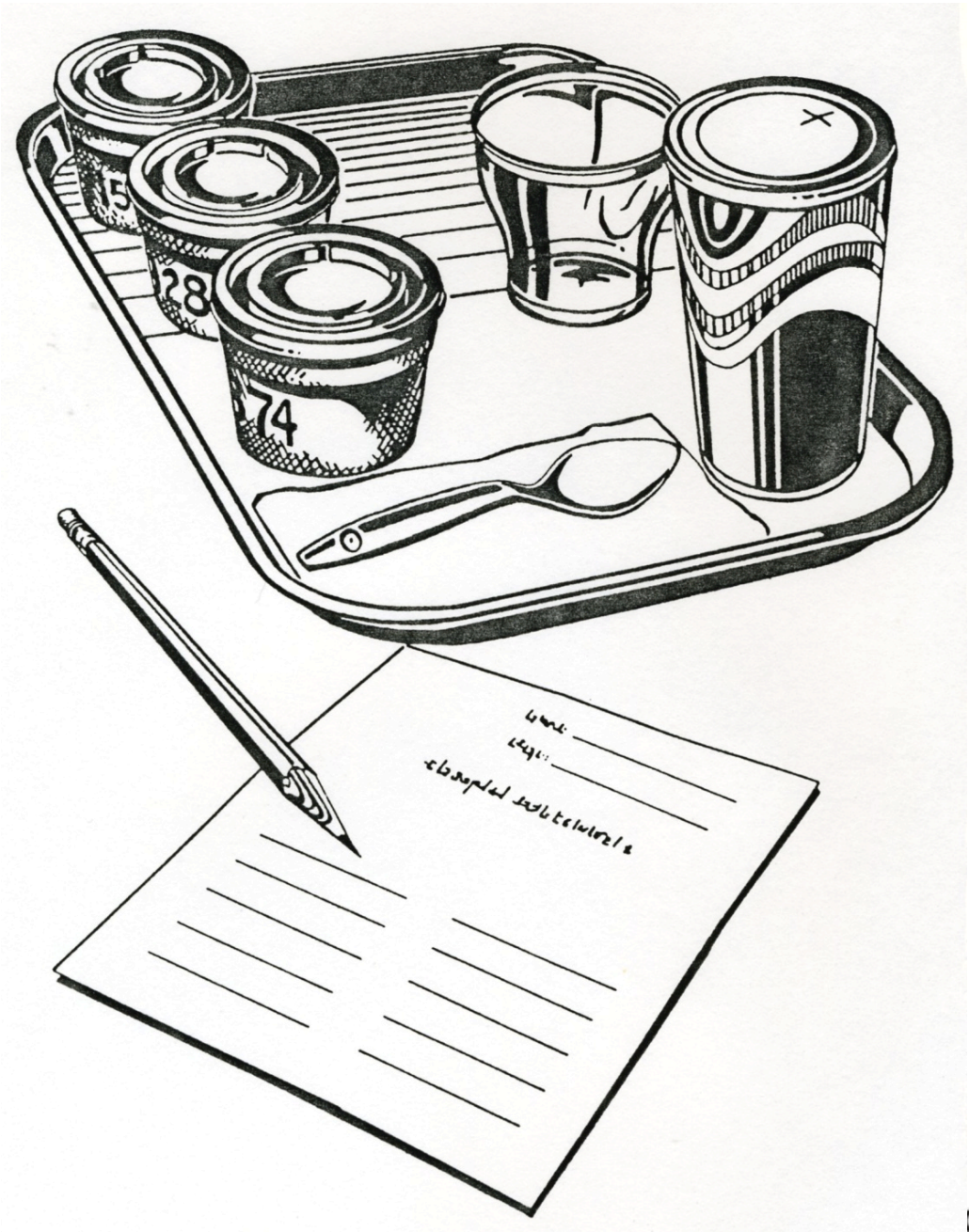


# Sample presentation

- standard/controlled **procedures** e.g. cooking regimes, serving temperature
- consistent **portion size**, representative of the sample to each assessor
- **sample coding** – commonly 3 digit random codes
- balanced, random **order of presentation**

**London South Bank  
University**

**A sample tray set-up  
for presentation to  
an assessor**



# 5. Sensory Tests and their Uses

# Types of sensory tests

Discrimination

Descriptive

Affective (preference / acceptance)

# Discrimination / difference tests

Scope:

“Does a sensory difference exist between my samples?”

# Overall difference tests

Can be used to identify detectable difference between samples being compared in the same session

The most common method is **Triangle Test**



830



198



224



# Applications of difference tests

- Screening and training assessors
- Assessing the effect of changes in raw material, process and / or packaging on finished product quality
- Investigating the presence of off-flavours and taints
- Determining changes in product quality over shelf life
- Verifying changes to formulations during product development

# Descriptive tests (descriptive profiling methods)

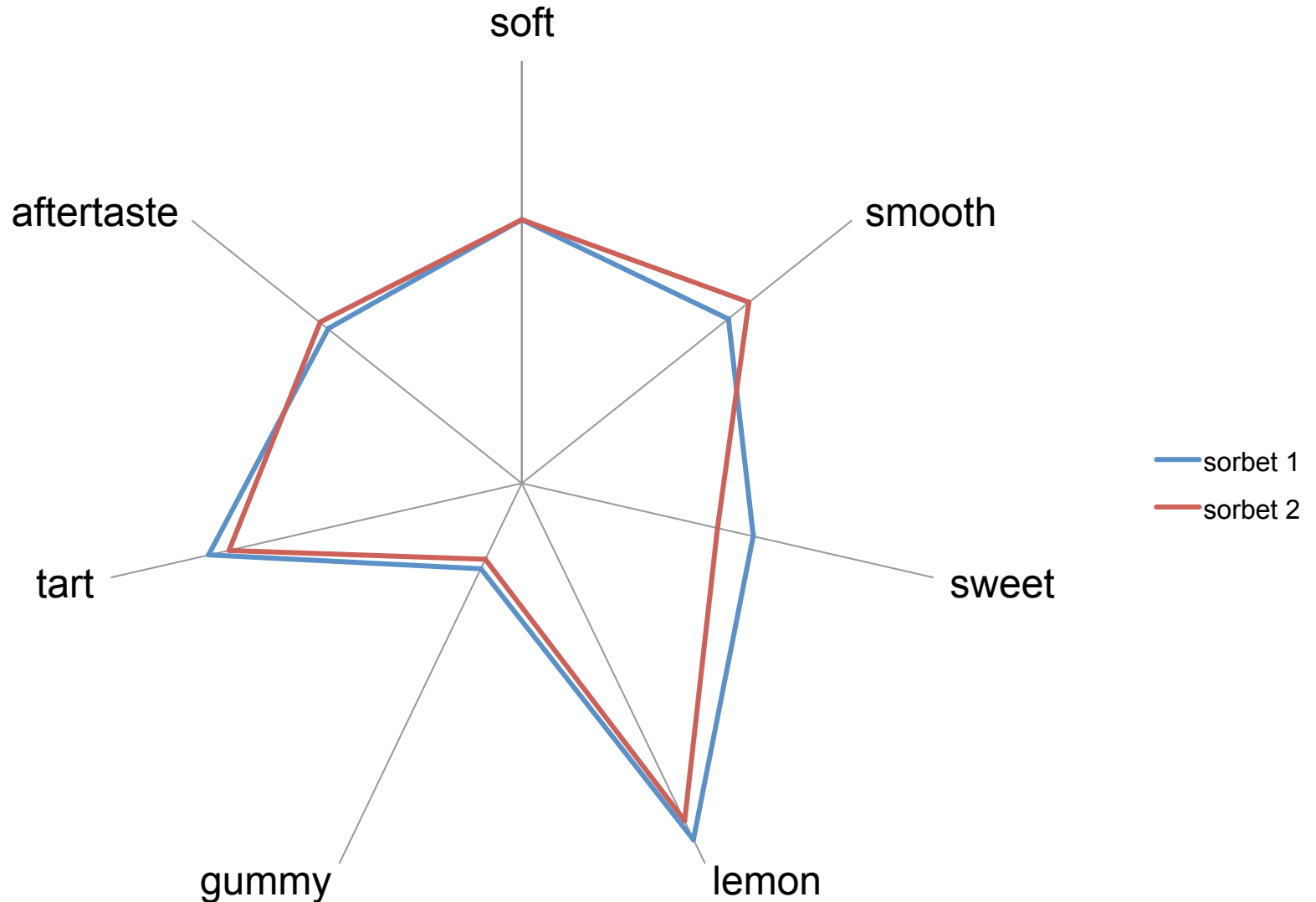
Scope:

“What is the nature of the differences  
between my samples?”

# Descriptive tests

- The perceived levels (**intensities**) of each of the described attributes are measured (quantitative aspect)
- Methods of descriptive analysis can only be used by a **highly trained** (expert) panel, usually consisting of a minimum of 6 – 8 assessors
- The result is usually a **sensory profile** or fingerprint of each product.

# Presentation of results



# Applications of descriptive profiling

- Defining the sensory properties of a target product for new product development
- Defining the characteristics (specification) of a control or standard, for QA/QC and R&D purposes
- Monitoring changes in sensory properties of a product during shelf life
- Describing product attributes prior to consumer testing

# Affective (acceptance and preference) tests

Scope:

“What sample is most acceptable or most preferred?”

# Affective tests

- Affective testing is useful for preliminary investigations prior to consumer research i.e. consumer-orientated testing
- The tests require the use of untrained assessors; at least 50 – 100 are recommended
- Separate sensory panels should be established for affective testing

# Preference tests

Ranking used for assessing order of preference

Q. Rank the drink samples in order of preference from least to most preferred





# Acceptance (liking) tests

9 Point Hedonic Scale used for assessing degree of liking:

- |   |                         |
|---|-------------------------|
| 9 | like extremely          |
| 8 | like very much          |
| 7 | like moderately         |
| 6 | like slightly           |
| 5 | neither like or dislike |
| 4 | dislike slightly        |
| 3 | dislike moderately      |
| 2 | dislike very much       |
| 1 | dislike extremely       |

# Sensory evaluation

## a summary

- a scientific discipline
- basic requirements
- benefits and applications