Sensory Analysis

Sensory analysis is a scientific discipline that uses human senses—sight, smell, taste, touch, and hearing—to evaluate and measure the sensory characteristics of food products. It plays a crucial role in quality control, product development, and consumer acceptance.

Definition of Sensory Analysis

Perception

Sensory analysis explores how humans perceive product characteristics, including their visual appearance, aroma, taste, texture, and sound. This involves understanding the complex interplay between sensory stimuli and individual perception, influenced by factors such as background, experience, and expectations. The goal is to objectively measure these perceptions to understand how the product is experienced.

Description

Employing the five senses—sight, smell, taste, touch, and hearing—sensory analysis systematically describes product characteristics. This detailed description goes beyond simple subjective opinions. Standardized methods and trained panelists ensure objectivity and reproducibility of results. The descriptors used are carefully chosen to convey precise information about the sensory attributes.

Evaluation

Sensory analysis assesses the quality of products by meticulously measuring consumer preferences and acceptance. This involves not only determining if a product is liked or disliked, but also identifying specific sensory attributes that drive those preferences. The process helps optimize products for target markets and ensures that quality remains consistently high.

Sensory Properties

Appearance

Visual characteristics like color, shape, and size.

Odor

Aroma or smell perceived through the olfactory system.

Taste

Flavor detected by taste buds on the tongue.

Texture

Physical characteristics felt by touch, like smoothness, roughness, or firmness.

Sound

Auditory cues, like the crunch of a crisp food or the sizzle of food cooking.

Sensory analysis used to...

Control Quality

Sensory analysis helps ensure consistent quality by identifying variations in taste, texture, and aroma.

Determine Shelf Life

Sensory tests can assess how a product changes over time and determine its optimal shelf life.

Evaluate Product Access

Sensory analysis helps understand how consumers perceive a product's flavor, texture, and appearance.

Sensory Panel Roles

A sensory panel is a group of individuals trained to evaluate food products using their senses. Each member plays a specific role based on their expertise and training.

- Sensory analyst: Highly trained professionals with extensive knowledge of sensory science.
- Selected tester: Individuals chosen for specific sensory tests based on their sensory abilities.
- Lay person: untrained consumers who provide insights from a general perspective.
- Test person: volunteers who participate in sensory studies for research or product development.

Types of Sensory Panels

Consumer Panels

Untrained testers without a selection process.

Objective Panels

Trained examiners screened by sensory ability.

Internal & External Panels

Composed of company employees or external persons.

Requirements for the testers

General requirements

- Availability
- Flexibility
- Pleasure in tasting products
- Neutral attitude towards products

Physiological requirements

- Good health
- No olfactory disorder, taste disorder, color blindness, etc.

Psychological requirements

- Ability to work in a team
- Objectivity
- Reliability

Linguistic requirements

- Good expressiveness
- Good command of the language in which the panel is conducted

Sensory Test Room Requirements

Sensory testing rooms should be designed to minimize external distractions and provide a neutral environment for product evaluation.

These rooms typically include features such as controlled lighting, temperature, and sound to ensure that product evaluation is not influenced by external factors.

These features are crucial for achieving reliable and accurate sensory data.

Sensory Workshop

A sensory workshop is a hands-on learning experience where participants can engage with different sensory testing methodologies and gain practical skills.

Grading/Scales

Learners explore various grading systems and scales used to quantify sensory attributes like sweetness, bitterness, and texture.

Triangle Test

Participants learn to perform a triangle test, a sensory discrimination test where they identify the odd sample out of three.

In/Out-Test

They are introduced to the in/out test, a method used to determine whether a product meets predetermined sensory standards.

Grading/ Scales

Quantitative Scales

These scales use numerical ratings (e.g., 1-9, 1-7) to measure the intensity of sensory attributes. For instance, a scale of 1-9 might range from "not at all" (1) to "extremely" (9) for attributes like sweetness, saltiness, or bitterness. A more nuanced approach might use a scale of 1-7, offering a more refined distinction between intensity levels. The choice of scale depends on the sensitivity needed and the complexity of the product being assessed.

Hedonic Scales

Hedonic scales measure liking or pleasure, gauging consumer preference rather than simply describing intensity. They often use descriptive terms (e.g., "dislike extremely," "dislike moderately," "neither like nor dislike," "like moderately," "like extremely") or facial scales to represent various degrees of liking. For example, a 9-point hedonic scale might use numerical anchors (-4 to +4, with 0 being neutral), making data analysis easier. Other scales might simply use descriptive anchors, relying on subjective evaluations. These scales are essential for understanding consumer acceptance and can significantly influence product development decisions.

Triangle Test Process

1

Preparation

Three samples are prepared, two identical and one different, coded with random numbers. A panel of trained or consumer participants is selected.

2

Execution

Samples are presented randomly, and participants identify the "odd one out." Palate cleansers minimize carryover effects. Responses are recorded.

3

Analysis

Statistical analysis determines if the difference is significant, considering the 1/3 chance of guessing correctly.

IN/OUT Test

1

Preparation

Prepare the reference sample and test sample under identical conditions.

2

Execution

Present the reference sample alongside the test sample to each panelist in a controlled environment.

3

Evaluation

Results are compiled to determine whether the majority of panelists classify the sample as "IN" or "OUT."

Descriptive Tests

1

Preparation

Objective: To qualitatively describe the sensory properties of a product. This involves selecting a trained sensory panel, providing them with detailed instructions, and ensuring the testing environment is controlled to minimize bias. Samples are prepared consistently and labeled with random codes to prevent bias.

2

Execution

Panelists systematically describe the sensory attributes of the product using a structured vocabulary. This might involve using specific terms to describe aroma, flavor, texture, appearance, and other relevant sensory characteristics. They might also use standardized scales to quantify certain attributes. The process is carefully monitored to ensure consistency and avoid external influences.

3

Functionality

Descriptive tests create detailed sensory profiles of products, which can be utilized in various applications such as product development, quality control, and competitive analysis. These profiles provide a comprehensive understanding of the sensory experience and help identify key characteristics that consumers might perceive. This can be crucial for making informed decisions about product improvements or for benchmarking against competitors.

Conclusion and Applications

Sensory analysis is a powerful tool for improving product quality and consumer satisfaction.

It can be used to identify consumer preferences and to develop new products that meet those preferences.

Sensory analysis can also be used to assess the impact of processing and storage on product quality.