

SENSORY EVALUATION TECHNIQUES

By

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Consumers

- Today's consumers are discerning, demanding and more knowledgeable about food and expect products which are safe, good value and of high sensory quality. Therefore, knowing consumers' preferences and perceptions of the sensory characteristics of food products is very important to food manufacturers and retailers alike.

Sensory Science

- Sensory science is the study of the reactions of the five senses - sight, hearing, smell, taste and touch - to the characteristics of physical matter. The discipline does not just deal with "likes and dislikes," but scientifically evokes, measures, analyses and interprets psychological responses to physical stimuli, and thus belongs to the specialized field of psychophysics.

Unique Approach

- "Sensory science," adopts a unique approach to identification of the attributes that matter most to the end-consumer. It employs "trained panelists," and where possible sensitive instruments, to provide the right guidance to the food manufacturers on what perceived attributes need to be incorporated into their products for their marketing success.

Measurement

- A person's sense of taste, smell, touch, sound and sight form his perception of food. In a taste panel, these senses can be measured scientifically to obtain information about particular aspects of a food.

Statistical Techniques

- When conducting a taste panel, food is uniformly prepared and presented to panelists in isolated booths. Judges record evaluations of the product on a sensory evaluation sheet that is decoded and analyzed by statistical procedures.

Scoring

Example-1: Compare with control sample

Attributes	Max-Score	Control	Sample-1	Sample-2
Appearance	30	25		
Texture	15	15		
Size	20	15		
Taste	25	20		
Aroma	10	10		
Total Score	100	85		

Scoring

Example-2: Compare among 3 samples

Attributes	Max-Score	Sample-1	Sample-2	Sample-3
Appearance	30			
Texture	15			
Size	20			
Taste	25			
Aroma	10			
Total Score	100			

Failure

- Without appropriate sensory analysis, there is a high risk of market failure."..."Sensory analysis is too frequently often overlooked as a requirement before product launch, and is often carried out to a poor standard.

Use

- To improve the sensory quality of a product or to ensure inter-batch consistency
- To understand the sensory characteristics of the products and how they influence consumer preferences
- To understand how the product performs against competitors' products in relation to consumer perceptions and or sensory characteristics
- To determine whether or not consumers can detect differences between products, e.g. 'me too' products, or changes in the product due to recipe modifications
- To influence product listings with retailers by presenting independent research demonstrating that the company has a greater understanding of their products profile and consumers

Requirement

- Sophisticated sensory booths that conform to ASTM standards (Separate air-conditioning maintained at $20\pm 2^{\circ}\text{C}$ and RH $40\pm 5\%$)
- Glassware/containers for sensory evaluation of varieties of foods
- Specialized software for statistical evaluation of sensory data
- Laboratory for chemical/physical analysis of raw materials and processed foods

Selection of Panelists

- Development of sensory evaluation techniques to be based on the selection of sensory panels
- Based on the criteria shown in the coming slides, sensory panel should be chosen (among the employees of the company), screened and trained

Expectations form Panelists

- To produce reliable and valid data, the sensory panel must be treated as a scientific instrument
- It is therefore, necessary that panelists are free from any psychological features and physical conditions which might affect human judgments
- Panelists must have an ability to perform the task and to repeat their judgments

Sensory Ability

- It is necessary that each panelist must be free from the following defects:
 - taste perception disorders
 - odor perception disorders
 - color blindness
 - denture defects

Health

- It is necessary that each panelist must be free from the following defects:
 - allergies
 - use of those medications that effect the ability to taste
 - prone to minor infections of nose & throat

Attitude & Interest

- It is necessary that each panelist must have the following:
 - motivation
 - availability

Training of the Sensory Panel

- It should be expected that since majority of the panelists will have no previous experience in product attributes, it will therefore be necessary to train them about the products first and then to take into account of differing quality expectations

Testing

- 2 type of testings will be expected from each panelist:
 - Discriminative Tests
 - Descriptive Tests

Discriminative Tests

- All panelists will be assessed for the following 2 types of discriminative tests:
 - Difference Tests: Tests to find a difference between the control and other products
 - Sensitivity Tests: To test the ability of panelists to detect sensory characteristics

Descriptive Tests

- Descriptive tests to be carried out among the panelists to measure their ability to evaluate qualitative and quantitative characteristics of the product

Psychological Factors Affecting Sensory Panel

- Some of the psychological factors (discussed in the coming slides) that might influence the sensory measurements of the panelists will have to be rectified

Expectation Error

- This occurs when panelists are given too much information about the samples.
- Therefore the panelists should not be informed about the types of ingredients used in the sensory testing

Stimulus Error

- This occurs when panelists are influenced by some characteristics of the sample (i.e.. size, shape, color, etc)
- Therefore the panelists will be instructed and trained not to impose the marking of one quality parameter on others

Suggestion Error

- This occurs when panelists are aware of reactions of others during the sensory evaluation
- This should be addressed by providing panelists with individual sensory booths (designed as per the details shown earlier)

Halo Effect

- Sometimes panelists evaluate more than one quality characteristic at a time
- They should therefore be trained and instructed to evaluate each quality parameter separately

Lack of Motivation

- Lack of motivation may be present among the panelists due to a number of reasons
- This can be handled by the management support, proper sensory schedules and the keen interest of all the panelists

Central Tendency Error

- Panellists may choose the mid range to avoid extremes
- All panellists should therefore be advised to choose the correct scale for each quality characteristic rather than just selecting the mid range of the scale to avoid extremes

Order Effect

- This may affect the panelists if the sensory samples are provided in a defined order
- All samples to be presented in a random order with a three digit number assigned to each sample to avoid the order effect

Sensory Team

- Based on the individual performance of each trainee panelist, 5 should finally be chosen for the sensory evaluation work and 2 should be kept as reserved panelists
- Separate sensory teams to be selected for different types of products based on the individual abilities of the panelists



Thank You

