FE 376 SENSORY ANALYSIS OF FOODS

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Sensory analysis testing is used considerably in the food industry for product development, recipe modification and the evaluation of products. It also plays a key role in quality control and in the marketing of products. Many types of sensory analysis tests have been devised to fulfil a number of specific objectives. These tests are grouped into three categories.

CATEGORIES OF SENSORY ANALYSIS TESTS

1. Preference Tests
2. Difference Tests
3. Descriptive Tests

Within each category there are various sensory analysis tests that can be carried out. The tests which are suitable for use in the classroom are included below.

1. PREFERENCE TESTS

Preference tests supply information about whether people like or dislike a product. Preference tests are used in the food industry to determine:

- if consumers like a product
- if one product is preferred over another
- if consumers intend to use a product.

Preference tests are often referred to as “acceptance” or “consumer” tests.

Preference Tests Suitable for Classroom Use

- Paired Preference Test
- Hedonic Rating Scale
- Food Action Rating Test
- Preference Ranking Test

2. DIFFERENCE TESTS

Difference tests are used to detect small differences in foods. Difference tests are used in the food industry to answer some of the following questions:

- does a difference exist?
- would people notice the difference?
- how would you describe the difference?

Difference tests are sometimes called “discrimination” tests.

Difference Tests Suitable for Classroom Use

- Simple Difference Paired Comparison Test
- Directional Paired Comparison Test
- Triangle Test
- Duo-Trio Test

3. DESCRIPTIVE TESTS

Descriptive tests are used to describe the perceived sensory characteristics of products. Descriptive tests can be used in the food industry to answer some of the following questions:

- what does the product taste like?
- what are its perceived sensory characteristics / attributes?
- how does a change in processing / packaging / storage conditions affect the sensory quality of this product?

Descriptive Tests Suitable for Classroom Use

- Descriptive Ranking Test
- Descriptive Rating Test – one product
- Descriptive Rating Test – two products

USES OF SENSORY ANALYSIS IN THE FOOD INDUSTRY

Sensory analysis testing has become an integral part of the food industry. It has many different purposes. It can be used to:

- evaluate a range of existing food products
- analyse a test kitchen sample for improvement
- gauge consumer response to a product
- check that a final product meets its original specifications
- evaluate differences in similar products
- analyse specific attributes e.g. shortness in biscuits.

It is important that the test chosen should suit the particular purpose. Very often more than one type of test will have to be carried out on products. Companies often develop products to taste like another, e.g. own label foods to taste like the brand leader. If a food is designed to taste like another, then a difference test is used. This may be followed by a preference test to find out the acceptability of the new product among consumers.

Preference tests can be used to research how a company's product compares to that of its competitors. A ranking test may be done and if the results of this are favourable to the company, this may be presented to retailers to persuade them to allocate more shelf space to the company's product.

Cost and quality are important factors in the food industry. A company may consider changing the supplier of one of the ingredients in a product for economic reasons. It is important that consumers do not detect that the product has been changed in any way. In this case the company may use a panel of trained testers to carry out difference tests to determine if the testers can detect a difference from the original product.

Companies may contemplate changes to their existing product based on consumer demand e.g. healthy eating, by replacing salt with a low sodium alternative. It is important that food companies are attentive to the demands of the consumer in order to retain their market share. As a result, sensory analysis testing is ongoing in industry.

Food companies may carry out their own sensory analysis testing or they may contract a specialist company to do this for them. Results of sensory analysis tests are calculated either manually or by computer programme. Statistical analysis is carried out to ensure reliability and validity of the results.

PRODUCT DEVELOPMENT IN THE FOOD INDUSTRY

Increased competition in the food industry has led to the development of new products. There is also constant re-appraisal of existing products, leading to improvements in e.g. flavour or packaging.
Product development may involve:

- **Making a completely new food product** - developing ideas for a new product by drawing up the product profile e.g. shape, size
- **Modifying an existing food product** - making changes to an original recipe e.g. adding or removing an ingredient to improve flavour or changing the size or shape of a product
- **Matching an existing food product** - copying other popular branded products of similar types.

Stages of Product Development
The process of product development involves a series of complex stages, requiring the combined talents of many specialists to make it successful. The main stages are outlined below.

1. **Development of ideas**
   Ideas are developed for the new product and a specification is produced.

2. **Testing of ideas on a small scale**
   Ideas are tested on a small scale. Research is carried out to formulate a number of recipes and specify the ingredients to be used. Several versions are made, altering ingredients or processes. In other words the products are prototyped, often by a professional chef or food consultant.

3. **Product modification**
   Trained testers evaluate the product being developed to ensure that it displays the desired characteristics. The recipe may need to be modified and further testing is carried out.

4. **Consumer testing**
   The product is then tested to determine consumer acceptability.

5. **Final product specification**
   The final product specification is then agreed detailing the exact ingredients and methods of production.

6. **Large scale production trial**
   Food scientists work together in a pilot plant to determine the best method of producing large quantities of the product.

7. **Large scale production**
   The product is then produced on a large scale. This is done under controlled conditions to maintain consistent product quality.

8. **Packaging and labelling**
   Appropriate packaging is chosen bearing in mind shelf-life considerations. Labelling is designed to meet legal requirements.

9. **Product launch**
   The product is advertised and then launched.

Sensory analysis testing is carried out at many stages as the product is being developed.