Sensory Analysis
Teacher’s Manual

Home Economics Support Service 2004
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INTRODUCTION

Sensory analysis is a new topic on the revised Leaving Certificate Home Economics Scientific and Social syllabus. This Teacher’s Manual and the accompanying DVD *Sensory Analysis in the Home Economics Class* have been specifically designed to assist with the implementation of this exciting area which combines both theory and practical activities. It is hoped that the DVD will introduce students to the wonderful world of sensory analysis, create an awareness of the important role it plays in all aspects of the food industry and help them develop some of the language and skills of sensory analysis. It should also be beneficial to students for the food studies practical coursework area of the syllabus.

Section 1 of the DVD, which includes many images from the food industry, provides some background theory on sensory analysis, including a brief history, the role of the senses, sensory analysis in the food industry and an introduction to the testing procedures used. It also includes guidelines on carrying out sensory analysis testing in the classroom. It is suggested that this section of the DVD be shown as a unit to the class before progressing to the second section.

In Section 2 students are introduced to ten different sensory analysis tests. All of the tests are stand-alone so that the teacher can select the particular test/s to be demonstrated at any given time. The tests have been specially tailored from industry for use in the classroom. They are designed in a user-friendly manner and are demonstrated on the DVD using a selection of everyday foods (other suitable foods can be substituted). Each test begins with an explanation of why it might be used, followed by a comprehensive set of instructions for carrying out the particular test in the classroom. This includes a list of materials required (based on working groups of four to six people), a step-by-step procedure for setting up each test, instructions for testing and an explanation of how results can be collated.

The corresponding step-by-step instructions for each test are also available in the Teacher’s Manual together with the specially designed scorecards with instructions for testers and record sheets for the collation of results. Templates of scorecards and record sheets, which can be photocopied for students, are included at the end of each test. The Teacher’s Manual also includes some general information on scales and the presentation of results.

Voiceover on the DVD and all materials in the Teacher’s Manual are available in both English and Irish. The materials in the Manual can be photocopied for students for classroom use. We hope that this package will help make learning an exciting and enjoyable journey for all students.
SENSORY ANALYSIS

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

Institute of Food Technologists, 1981.

This is a widely used definition, which highlights the fact that all of the senses are involved in sensory analysis. It means more than just food tasting. Sensory analysis is a recognised science. The term Sensory Analysis is the European term used whereas Sensory Evaluation is the American term.

BRIEF HISTORY OF SENSORY ANALYSIS

During the Second World War, food was restricted. However, following the cessation of food rationing in 1955, the focus shifted to food quality rather than quantity. As availability of food increased people became more discerning. In the 1960’s, the British Standards Institute set up a working group to draw up standards for sensory analysis. In the late 60’s and early 70’s, frozen, partly processed and new food products were developed. People’s lifestyles changed, supermarkets sprung up and a greater range of foods became available to the consumer. As a result of consumer expectations and food companies competing for space on the supermarket shelves, sensory analysis became an integral part of food production. Growth has been rapid since then and standards for setting up, testing and analysing results from sensory tests in the food industry are now at an advanced stage.

USING THE SENSES IN SENSORY ANALYSIS

Sensory analysis involves the examination of a product by the senses i.e. sight, smell, taste, touch and hearing. The five senses are used, either individually or in combination, to examine the characteristics of food. This is done all the time either consciously or subconsciously when choosing, buying or eating food.

The characteristics of a food can be looked at under the headings:

- Appearance
- Flavour
- Aroma
- Texture
- Sound.
Using the Senses in Sensory Analysis

Appearance
Colour, Size, Shape

Flavour
Sweet, Sour

Aroma
Flavour, Aromatics

Sight

Smell

Taste

Touch

Hearing

Texture
Mechanical and Tactile Properties

Sound
Intensity and Quality

Appearance
This is the visual perception of food, which includes colour, size, shape, transparency, dullness and gloss. The colour of food is very important e.g. green peas. The shape, size and surface appearance will influence consumers and determine whether they accept or reject a food. One would expect to find mould in Stilton cheese but not on bread. Wilted lettuce or carrots that have a wizened appearance are not acceptable.

Flavour
This has three components.
- Odour contributes to the pleasure of eating e.g. the smell of freshly baked bread.
- Mouthfeel, where the nerves in the skin of the mouth are stimulated by thermal or chemical reactions e.g. the coldness of ice cream or the burning sensation of chilli.
- Taste plays a vital role in recognising, accepting and appreciating food. Taste is sensed by the taste buds on the tongue. There are four types of taste sensation: Sweet, Salt, Sour and Bitter.

Sour and bitter are often confused. Lemon juice has a sour taste whereas coffee has a bitter taste.
Aroma
Smell evaluates the aroma of food and is important in the appreciation of flavour. A pleasant aroma makes food appetising. To arouse a sensation of smell, a substance must be in a gaseous state. Smell is useful in detecting fresh, rancid or occasionally poisonous food.

Texture
Texture is perceived by a combination of senses i.e. touch, mouthfeel, sight and hearing. Texture is a key quality for many foods e.g. the tenderness of meat, the softness of bread. It would also include the consistency, viscosity, brittleness, chewiness and the size and shape of particles in food e.g. the texture of a pear that is gritty.

Sound
Hearing considers the sounds made by food during preparation and consumption e.g. the sizzle of fried food, the fizz of drinks, the crunch of raw vegetables, the cracking of hard biscuits.

So, in sensory analysis, the senses are used to measure, analyse and interpret the organoleptic or sensory properties of food.
SENsory Analysis in the food industry

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 fulfill 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.
SENSORY ANALYSIS IN THE HOME ECONOMICS CLASS

In the Home Economics class, sensory analysis is used for the following activities:

- evaluation of products / dishes
- product development and recipe modification.

Evaluation of Products
When evaluating products students may:

- identify and describe the characteristics of a food e.g. flavour, appearance, shape
- rate the characteristics of a food e.g. colour - very pale to very dark
- compare foods e.g. in terms of taste.

Product Development and Recipe Modification
In product development and recipe modification students may:

- draw up a product profile that describes the desired characteristics of a food or product
- design a product e.g. a range of biscuits for a cake sale
- modify a recipe to suit the design e.g. change the ingredients, flavour, shape
- compare a modified recipe with an original recipe, or with a similar branded product
- test the end product for acceptability e.g. among their classmates
- assess quality assurance e.g. shelf life issues such as how the absorption of fat from a food or the retention of moisture may affect packaging.

TASTING AND TESTING IN THE CLASSROOM

Before carrying out sensory analysis tests as required for an assignment, it would be important to have a certain amount of preparation done. This could include:

- the basic theory of sensory analysis
- a vocabulary of descriptive terms
- guidelines for testing in the classroom
- procedure for tests appropriate to the assignment.
GUIDELINES FOR TESTING IN THE CLASSROOM

Where to Test
Ideally testing takes place in special testing booths. However, a quiet area of the classroom, with adequate light and ventilation, could be used. Ensure adequate space between testers.

Testing Session
It is very important that silence is maintained throughout the session and that students should not discuss their results. Keep the testing session short to avoid fatigue.

Timing
Mid-morning is the best time before any aromas of cooking fill the air. If this is not possible, try and ensure that the room is odour free and well ventilated. Testers should not eat strongly flavoured food in the thirty minutes immediately prior to the test.

Number in Group
This will depend on the size of the class. When arranging tests in class, it is important that the people involved in testing the food samples should not be involved in the coding and arranging of samples, or in the collating of results for these samples. This is because they will be familiar with the coded samples on the trays that they have set up.

Special Dietary Conditions
Take into account students with special dietary conditions e.g. a coeliac should not test starchy foods.

Hygiene
Ensure that the general rules of hygiene apply for the handling of all food samples.

Equipment
The size and shape of containers should be standard. Polystyrene cups, paper plates and plastic spoons are useful equipment for testing food. These could either be disposable or a designated set of plastic equipment.

Quantity of Sample
The samples presented should be sufficient in amount. Ensure that all samples are uniform in colour, shape and size.

Temperature
It is important that all samples presented are at the same temperature.

Coding of Samples
One of the most important things about testing is making sure that testers are unaware of the identity of products, which means that coding is necessary. This is an essential part of every test carried out. Samples can be coded with geometric shapes e.g. triangle, square, circle. They can also be coded with three digit numbers. Codes used should not induce any bias among testers. For example if samples are coded A and B, testers might feel that sample A is the better sample. A record should be kept of the arrangement of samples presented to each tester.

Number of Samples
In industry large numbers of testers are used and tests are repeated a number of times to ensure validity and reliability. This is not required in the classroom situation.

Setting of Trays
Ensure that a glass of water and / or dry crackers are included on trays in order to cleanse the palate between the tasting of samples.
# TASTING AND TESTING WORD BANK

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Flavour</th>
<th>Smell</th>
<th>Texture</th>
<th>Sound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appetising</td>
<td>Acidic</td>
<td>Aromatic</td>
<td>Adhesive</td>
<td>Bubbling</td>
</tr>
<tr>
<td>Attractive</td>
<td>Bitter</td>
<td>Astringent</td>
<td>Airy</td>
<td>Crackly</td>
</tr>
<tr>
<td>Brittle</td>
<td>Bland</td>
<td>Burnt</td>
<td>Brittle</td>
<td>Crunchy</td>
</tr>
<tr>
<td>Burnt</td>
<td>Buttery</td>
<td>Coffee</td>
<td>Bubbly</td>
<td>Grating</td>
</tr>
<tr>
<td>Cellular</td>
<td>Creamy</td>
<td>Fermented</td>
<td>Chewy</td>
<td>Fizzy</td>
</tr>
<tr>
<td>Clear</td>
<td>Fatty</td>
<td>Floral</td>
<td>Coarse</td>
<td>Percolating</td>
</tr>
<tr>
<td>Cloudy</td>
<td>Herby</td>
<td>Fresh</td>
<td>Cohesive</td>
<td>Sizzling</td>
</tr>
<tr>
<td>Cold</td>
<td>Hot</td>
<td>Fruity</td>
<td>Cold</td>
<td>Snapping</td>
</tr>
<tr>
<td>Colourful</td>
<td>Musty</td>
<td>Musty</td>
<td>Crisp</td>
<td></td>
</tr>
<tr>
<td>Colourless</td>
<td>Piquant</td>
<td>Pungent</td>
<td>Crumbly</td>
<td></td>
</tr>
<tr>
<td>Creamy</td>
<td>Salty</td>
<td>Rancid</td>
<td>Crunchy</td>
<td></td>
</tr>
<tr>
<td>Crumbly</td>
<td>Sharp</td>
<td>Roasted</td>
<td>Crystalline</td>
<td></td>
</tr>
<tr>
<td>Dark</td>
<td>Smokey</td>
<td>Smokey</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>Dry</td>
<td>Sour</td>
<td>Sour</td>
<td>Effervescent</td>
<td></td>
</tr>
<tr>
<td>Foamy</td>
<td>Spicy</td>
<td>Spicy</td>
<td>Elastic</td>
<td></td>
</tr>
<tr>
<td>Fresh</td>
<td>Stale</td>
<td>Stale</td>
<td>Fibrous</td>
<td></td>
</tr>
<tr>
<td>Grained</td>
<td>Sweet</td>
<td>Sweet</td>
<td>Fine</td>
<td></td>
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<tr>
<td>Greasy</td>
<td>Tangy</td>
<td>Tart</td>
<td>Firm</td>
<td></td>
</tr>
<tr>
<td>Healthy</td>
<td>Tasty</td>
<td>Tasty</td>
<td>Fizzy</td>
<td></td>
</tr>
<tr>
<td>Moist</td>
<td>Tasteless</td>
<td>Tasteless</td>
<td>Flaky</td>
<td></td>
</tr>
<tr>
<td>Mottled</td>
<td>Undercooked</td>
<td>Undercooked</td>
<td>Flat</td>
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<tr>
<td>Opaque</td>
<td>Watery</td>
<td>Watery</td>
<td>Foamy</td>
<td></td>
</tr>
<tr>
<td>Pale</td>
<td></td>
<td></td>
<td>Grainy</td>
<td></td>
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<td>Greasy</td>
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<td>Shiny</td>
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<td>Gritty</td>
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<td>Hard</td>
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</tr>
<tr>
<td>Smooth</td>
<td></td>
<td></td>
<td>Juicy</td>
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<tr>
<td>Soggy</td>
<td></td>
<td></td>
<td>Lumpy</td>
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<tr>
<td>Sticky</td>
<td></td>
<td></td>
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<tr>
<td>Thick</td>
<td></td>
<td></td>
<td>Mushy</td>
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<tr>
<td>Translucent</td>
<td></td>
<td></td>
<td>Powdery</td>
<td></td>
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<tr>
<td>Watery</td>
<td></td>
<td></td>
<td>Rubberly</td>
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</table>


TRAINING FOR TASTING AND TESTING IN SENSORY ANALYSIS

Panels of trained testers are used in the food industry to taste and test food products. In order to train students in tasting and testing, particularly in the descriptive and difference tests, it would be useful, as is done in industry, to do a few preliminary tests with them. The most useful tests would be the taste identification test and taste intensity tests.

TASTE IDENTIFICATION TEST

Aim: To encourage students to develop an awareness of the basic tastes - sweet, sour, salt and bitter.

Materials required per student
- 4 cups. Code the cups 1, 2, 3 and 4.
- 1 glass of water (to rinse mouth)

Procedure
1. Prepare the cups as follows:
   - Cup 1: 250ml water + 1 teasp. sugar.......................... Sweet
   - Cup 2: 250ml water + ½ teasp. salt............................ Salt
   - Cup 3: 250ml water + 2 teasp. lemon juice.................. Sour
   - Cup 4: 250ml water + 100ml tonic water (decarbonated) .... Bitter

2. Instruct students to follow instructions on scorecard.

<table>
<thead>
<tr>
<th>Scorecard</th>
<th>Taste Identification Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tray number</td>
<td>Name _____________________________</td>
</tr>
</tbody>
</table>

You are presented with 4 samples of solutions which represent the basic taste sensations of sweet, sour, salt and bitter.

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for 10 seconds and note the taste.

Proceed through the other samples in a similar manner, rinsing your mouth between each.

Fill in the taste identified in each case.

<table>
<thead>
<tr>
<th>Solution</th>
<th>Taste Identified</th>
<th>Correct ✓</th>
<th>Incorrect ×</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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</table>

3. Collect scorecards and correct results.
# TEMPLATES

**Scorecard**  
**Taste Identification Test**

Tray number .................... Name .................................................................

You are presented with 4 samples of solutions which represent the basic taste sensations of sweet, sour, salt and bitter.  
Starting in any order, choose a cup, take a sip from it, hold it in your mouth for 10 seconds and note the taste.  
Proceed through the other samples in a similar manner, rinsing your mouth between each.  
Fill in the taste identified in each case.

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**Scorecard**  
**Taste Identification Test**

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</table>
TASTE INTENSITY TESTS

Taste intensity tests are used to encourage students to discriminate between concentrations of particular tastes.

**Taste Intensity Test**

- Testers are presented with three coded samples
- Testers must indicate the order of the samples in terms of intensity of the specified taste

**Salt Intensity Test**

**Aim:** To discriminate between the taste intensity of three solutions.

**Materials required based on six testers**

- 6 trays
- 6 glasses of water
- 18 containers
- 6 scorecards

**Procedure**

1. Code 18 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○
   - 6 containers with symbol △

2. Place the following solutions into coded containers:
   - 6 coded □ - 250ml water
   - 6 coded ○ - 250ml water + ½ teasp. salt
   - 6 coded △ - 250ml water + 1 teasp. salt
   Water can be slightly warm to aid the dissolving of salt.

3. Set up trays numbered 1 - 6. Place one container with symbol □, one with symbol ○ and one with symbol △ on each tray.

4. Instruct testers to follow instructions on scorecard.

**Scorecard**

**Salt Intensity Test**

<table>
<thead>
<tr>
<th>Tray number ..........</th>
<th>Name .....................................................</th>
</tr>
</thead>
</table>

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for at least 10 seconds and note the taste.
Proceed through the other samples in a similar manner, rinsing your mouth between each.
Please indicate the order of the samples in terms of taste intensity i.e. 1 for the weakest solution and 3 for the strongest solution.

□ _____  ○ _____  △ _____

5. Collect and correct results.
Sour and sweet intensity tests can be carried out in a similar manner.

**Sour**
- 250ml water
- 250ml water + 1 teasp. lemon juice
- 250ml water + 1 tablesp. lemon juice

**Sweet**
- 250ml water
- 250ml water + 1 teasp. sugar
- 250ml water + 1 tablesp. sugar

---

### Scorecard

**Sour Intensity Test**

<table>
<thead>
<tr>
<th>Tray number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for at least 10 seconds and note the taste. Proceed through the other samples in a similar manner, rinsing your mouth between each. Please indicate the order of the samples in terms of taste intensity i.e. 1 for the weakest solution and 3 for the strongest solution.

☐ ______  ○ ______  △ ______

---

### Scorecard

**Sweet Intensity Test**

<table>
<thead>
<tr>
<th>Tray number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for at least 10 seconds and note the taste from it. Proceed through all three samples in a similar manner, rinsing your mouth out between each. Please indicate the order of the samples in terms of taste intensity i.e. 1 for the weakest solution and 3 for the strongest solution.

☐ ______  ○ ______  △ ______
TEMPLATES

Scorecard
Salt Intensity Test

Tray number ............ Name .................................................................

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for at least 10 seconds and note the taste.
Proceed through the other samples in a similar manner, rinsing your mouth between each.
Please indicate the order of the samples in terms of taste intensity i.e. 1 for the weakest solution and 3 for the strongest solution.

☐ _____  ○ _____  △ _____

Scorecard
Sour Intensity Test

Tray number ............ Name .................................................................

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for at least 10 seconds and note the taste.
Proceed through the other samples in a similar manner, rinsing your mouth between each.
Please indicate the order of the samples in terms of taste intensity i.e. 1 for the weakest solution and 3 for the strongest solution.

☐ _____  ○ _____  △ _____

Scorecard
Sweet Intensity Test

Tray number ............ Name .................................................................

Starting in any order, choose a cup, take a sip from it, hold it in your mouth for at least 10 seconds and note the taste from it.
Proceed through all three samples in a similar manner, rinsing your mouth out between each.
Please indicate the order of the samples in terms of taste intensity i.e. 1 for the weakest solution and 3 for the strongest solution.

☐ _____  ○ _____  △ _____
**PREFERENCE TEST**

**Paired Preference Test**
A paired preference test is used to express a preference between two products.

**Paired Preference Test**
- Tester is presented with two coded samples
- Tester decides which one they prefer

**Procedure for a Paired Preference Test**

**Aim:** To determine which of two samples of Shortbread is preferred by testers.

**Materials required based on six testers**
- 6 trays
- 6 glasses of water
- 12 containers
- 6 samples of food A – Stewart’s Shortbread
- 6 samples of food B – Gordon’s Shortbread
- 6 scorecards
- 6 record sheets

**Procedure**
1. Code 12 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○

2. Arrange shortbread in containers:
   - 6 coded □ - Stewart’s Shortbread
   - 6 coded ○ - Gordon’s Shortbread

3. Set up trays numbered 1 – 6. Place one container with symbol □ and one with symbol ○ on each tray.
4. Instruct testers to follow instructions on scorecard.

<table>
<thead>
<tr>
<th>Scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired Preference Test</td>
</tr>
</tbody>
</table>

Tray number ....................
Name .................................................................

In front of you are two coded samples. Taste each sample and tick ✓ the sample that you prefer.

☐  ☐

5. Collect scorecards and transfer results onto record sheet.

6. Count results.

7. Reveal codes and present results.

<table>
<thead>
<tr>
<th>Record Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired Preference Test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Ticks</th>
<th>Total Number of Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Stewart's</td>
<td>✓✓✓✓</td>
<td>4</td>
</tr>
<tr>
<td>☐ Gordon's</td>
<td>✓✓</td>
<td>2</td>
</tr>
</tbody>
</table>

In the above record sheet four testers ticked Stewart's Shortbread coded ☐ and two testers ticked Gordon's Shortbread coded ○. Therefore the preferred product was Stewart's Shortbread.

8. Evaluate results.
TEMPLATES

Scorecard
Paired Preference Test

Tray number ............  Name ...........................................................................................................

In front of you are two coded samples. Taste each sample and tick ✓ the sample that you prefer.

   □    ○


Scorecard
Paired Preference Test

Tray number ............  Name ...........................................................................................................

In front of you are two coded samples. Taste each sample and tick ✓ the sample that you prefer.

   □    ○

Scorecard
Paired Preference Test

Tray number ............  Name ...........................................................................................................

In front of you are two coded samples. Taste each sample and tick ✓ the sample that you prefer.

   □    ○
## TEMPLATES

### Record Sheet

**Paired Preference Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Ticks</th>
<th>Total Number of Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Record Sheet

**Paired Preference Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Ticks</th>
<th>Total Number of Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Record Sheet

**Paired Preference Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Ticks</th>
<th>Total Number of Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Record Sheet

**Paired Preference Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Ticks</th>
<th>Total Number of Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PREFERENCE TEST

Hedonic Rating Scale
Rating tests can be used to find out how much testers like or dislike a product. The term hedonic means having to do with pleasure so rating scales to do with likes or dislikes are called hedonic rating scales.

Hedonic Rating Scale
- Tester is presented with one or more coded samples
- Tester indicates their degree of liking for each product

Procedure for a Hedonic Rating Scale

Aim: To determine the extent of liking for each of three brands of Digestive Biscuits.

Materials required based on five testers
- 5 trays
- 5 glasses of water
- 15 containers
- 5 samples food A - White Pack Digestive Biscuits
- 5 samples food B - Red Pack Digestive Biscuits
- 5 samples food C - Blue Pack Digestive Biscuits
- 5 scorecards
- 5 record sheets

Procedure
1. Code 15 food containers as follows:
   - 5 containers with symbol □
   - 5 containers with symbol ○
   - 5 containers with symbol ★

2. Arrange biscuits in containers:
   - 5 containers coded □ - White Pack Digestive Biscuits
   - 5 containers coded ○ - Red Pack Digestive Biscuits
   - 5 containers coded ★ - Blue Pack Digestive Biscuits

3. Set up trays numbered 1 - 5. Place one container with symbol □, one with symbol ○ and one with symbol ★ on each tray.
4. Instruct testers to follow instructions on scorecard.

<table>
<thead>
<tr>
<th>Scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedonic Rating Scale</td>
</tr>
</tbody>
</table>

Tray number ............. Name ..............................................................

In front of you are three coded samples. Taste each sample and tick ✓ how much you like or dislike it.

☐  O  ✗

Like a lot

Like a little

Neither like nor dislike

Dislike a little

Dislike a lot

5. Collect scorecards and transfer results onto record sheet.

6. Calculate results.
   To calculate the score for each product assign each descriptor a score value:
   like a lot = 5  like a little = 4  neither like nor dislike = 3  dislike a little = 2  dislike a lot = 1.
   Work out the average score for each product.

<table>
<thead>
<tr>
<th>Record Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedonic Rating Scale</td>
</tr>
</tbody>
</table>

Food Product  ☐ White Pack Digestive Biscuits
Food Product  O Red Pack Digestive Biscuits
Food Product  ✗ Blue Pack Digestive Biscuits

Score Value Assigned:
   like a lot = 5  like a little = 4  neither like nor dislike = 3  dislike a little = 2  dislike a lot = 1

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Tester</th>
<th>Total Score</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1  2  3  4  5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td>5 pts 5 pts 4 pts 4 pts 5 pts</td>
<td>(\frac{23}{5}) = 4.6</td>
<td>5 points</td>
</tr>
<tr>
<td>O</td>
<td>5 pts 2 pts 3 pts 5 pts 3 pts</td>
<td>(\frac{18}{5}) = 3.6</td>
<td>4 points</td>
</tr>
<tr>
<td>✗</td>
<td>1 pt 1 pt 2pts 3 pts 1 pt</td>
<td>(\frac{8}{5}) = 1.6</td>
<td>2 points</td>
</tr>
</tbody>
</table>
7. Reveal codes and present results.
   - **Product □** - White Pack Digestive Biscuits were liked a lot (6 pts).
   - **Product ○** - Red Pack Digestive Biscuits were liked a little (4 pts).
   - **Product ★** - Blue Pack Digestive Biscuits were disliked a little (2 pts).

Therefore White Pack Digestive Biscuits was the preferred product.

8. Evaluate results.
## TEMPLATES

<table>
<thead>
<tr>
<th>Scorecard</th>
<th>Hedonic Rating Scale</th>
</tr>
</thead>
</table>

Tray number ………….. Name ……………………………………………………………………………

In front of you are three coded samples. Taste each sample and tick ✓ how much you like or dislike it.

<table>
<thead>
<tr>
<th></th>
<th>□</th>
<th>○</th>
<th>*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like a little</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither like nor dislike</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike a little</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scorecard</th>
<th>Hedonic Rating Scale</th>
</tr>
</thead>
</table>

Tray number ………….. Name ……………………………………………………………………………

In front of you are three coded samples. Taste each sample and tick ✓ how much you like or dislike it.

<table>
<thead>
<tr>
<th></th>
<th>□</th>
<th>○</th>
<th>*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like a little</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither like nor dislike</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike a little</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Record Sheet
**Hedonic Rating Scale**

#### Food Product
- ☐ ________________
- ○ ________________
- ∗ ________________

#### Score Value Assigned:
- like a lot = 5
- like a little = 4
- neither like nor dislike = 3
- dislike a little = 2
- dislike a lot = 1

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Tester</th>
<th>Total Score</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∗</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Record Sheet
**Hedonic Rating Scale**

#### Food Product
- ☐ ________________
- ○ ________________
- ∗ ________________

#### Score Value Assigned:
- like a lot = 5
- like a little = 4
- neither like nor dislike = 3
- dislike a little = 2
- dislike a lot = 1

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Tester</th>
<th>Total Score</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∗</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PREFERENCE TEST

Food Action / Attitude Rating Test
In a food action rating test a scale is used to determine the attitudes of testers to a food. It is often referred to as a “FACT Scale”. The test can be carried out on one or more samples of food.

Food Action Rating Test
- Tester is presented with one or more food samples
- Tester indicates their attitude to the food on prepared scales

Procedure for a Food Action Rating Test

Aim: To determine the attitude of testers to one type of Cheddar Cheese.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 6 containers
- 6 samples of Cheddar Cheese
- 6 scorecards
- 6 record sheets

Procedure
1. Place the cheese samples in six containers.
2. Set up trays numbered 1 - 6. Place one container on each tray.
3. Instruct testers to follow instructions on scorecard.

<table>
<thead>
<tr>
<th>Scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Action Rating Test</td>
</tr>
</tbody>
</table>

Tray number ............ Name .................................................................

You are presented with a food sample. Please taste the sample and tick ✓ the box that best describes how you feel about it.

- I would eat this every opportunity that I had
- I would eat this very often
- I like this and would eat it now and then
- I would eat this if available but would not go out of my way
- I don’t like this but would eat it on occasion
- I would hardly ever eat this
- I would eat this only if forced to

4. Collect scorecards and transfer results onto record sheet.

<table>
<thead>
<tr>
<th>Record Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Action Rating Test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action</th>
<th>Total Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would eat this every opportunity that I had</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>I would eat this very often</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>I like this and would eat it now and then</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>I would eat this if available but would not go out of my way</td>
<td>✓</td>
</tr>
<tr>
<td>I don’t like this but would eat it on occasion</td>
<td>✓</td>
</tr>
<tr>
<td>I would hardly ever eat this</td>
<td>✓</td>
</tr>
<tr>
<td>I would eat this only if forced to</td>
<td>✓</td>
</tr>
</tbody>
</table>

5. Count results.

6. Present results.

   In this case, three testers would eat this food now and then; two would eat it very often and one would eat it if available but would not go out of their way to eat it.

7. Evaluate results.
TEMPLATES

Scorecard
Food Action Rating Test

Tray number ............... Name .................................................................

You are presented with a food sample. Please taste the sample and tick ✓ the box that best describes how you feel about it.

☐ I would eat this every opportunity that I had
☐ I would eat this very often
☐ I like this and would eat it now and then
☐ I would eat this if available but would not go out of my way
☐ I don't like this but would eat it on occasion
☐ I would hardly ever eat this
☐ I would eat this only if forced to
## TEMPLATES

### Record Sheet

**Food Action Rating Test**

<table>
<thead>
<tr>
<th>Action</th>
<th>Total Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would eat this every opportunity that I had</td>
<td></td>
</tr>
<tr>
<td>I would eat this very often</td>
<td></td>
</tr>
<tr>
<td>I like this and would eat it now and then</td>
<td></td>
</tr>
<tr>
<td>I would eat this if available but would not go out of my way</td>
<td></td>
</tr>
<tr>
<td>I don’t like this but would eat it on occasion</td>
<td></td>
</tr>
<tr>
<td>I would hardly ever eat this</td>
<td></td>
</tr>
<tr>
<td>I would eat this only if forced to</td>
<td></td>
</tr>
</tbody>
</table>
PREFERENCE TEST

Preference Ranking Test
Preference ranking tests are used to rank foods in order of preference. They are used when two or more samples are being tested. The number of samples used is dependent on the tester’s attention span and memory. The tester is asked to assign an order to the samples according to his / her preference. Ranking tests do not determine the degree of liking / disliking for each of the samples.

- Tester is presented with a number of coded samples
- Tester ranks samples in order of preference

Procedure for a Preference Ranking Test

Aim: To determine which of three different brands of Chocolate Yoghurt is preferred by testers.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 18 containers
- 6 samples of food A – Yellow Pack Chocolate Yoghurt
- 6 samples of food B – Red Pack Chocolate Yoghurt
- 6 samples of food C – Blue Pack Chocolate Yoghurt
- 6 scorecards
- 6 record sheets

Procedure
1. Code 18 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○
   - 6 containers with symbol *

2. Arrange yoghurt in containers:
   - 6 coded □ - Yellow Pack Chocolate Yoghurt
   - 6 coded ○ - Red Pack Chocolate Yoghurt
   - 6 coded * - Blue Pack Chocolate Yoghurt
3. Set up trays numbered 1 - 6. Place one container with symbol □, one with symbol ○ and one with symbol ★ on each tray.

![Coded samples diagram]

4. Instruct testers to follow instructions on scorecard.

**Scorecard**  
**Preference Ranking Test**

Tray number .............. Name .................................................................

In front of you are three coded samples. Taste each sample.

Please indicate your preference by placing:
- 1st choice beside the sample that you prefer most
- 2nd choice beside your next preference
- 3rd choice beside the one you least prefer.

□ ________________ ○ ________________ ★ ________________
5. Collect scorecards and transfer results onto record sheet.

6. Calculate results.
   To calculate the results assign each choice a score value:
   1st choice give 3 points
   2nd choice give 2 points
   3rd choice give 1 point

   Calculate the score for each product by multiplying the number of ticks in each box by the score value assigned to that choice as in the record sheet below. The order of preference is determined from the score i.e. the product with the highest score is the preferred product.

<table>
<thead>
<tr>
<th>Food Product</th>
<th>1st choice</th>
<th>2nd choice</th>
<th>3rd choice</th>
<th>Score</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓</td>
<td>2x3=6</td>
<td>12 points</td>
</tr>
<tr>
<td></td>
<td>2x2=4</td>
<td>✓ ✓</td>
<td>✓</td>
<td>2x1=2</td>
<td></td>
</tr>
<tr>
<td>○</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>2x3=6</td>
<td>13 points</td>
</tr>
<tr>
<td></td>
<td>3x2=6</td>
<td>✓</td>
<td>✓ ✓</td>
<td>1x1=1</td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓ ✓</td>
<td>2x3=6</td>
<td>11 points</td>
</tr>
<tr>
<td></td>
<td>1x2=2</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>3x1=3</td>
<td></td>
</tr>
</tbody>
</table>

7. Reveal codes and present results.
   In the above case Red Pack Chocolate Yoghurt was the group preference, followed by Yellow Pack.
   Blue Pack Chocolate Yoghurt was the least preferred of the three samples.

8. Evaluate results.
TEMPLATES

Scorecard
Preference Ranking Test

Tray number ............  Name ..............................................................

In front of you are three coded samples. Taste each sample.

Please indicate your preference by placing:
1st choice beside the sample that you prefer most
2nd choice beside your next preference
3rd choice beside the one you least prefer.

□ _______________  ○ _______________  * _______________

Scorecard
Preference Ranking Test

Tray number ............  Name ..............................................................

In front of you are three coded samples. Taste each sample.

Please indicate your preference by placing:
1st choice beside the sample that you prefer most
2nd choice beside your next preference
3rd choice beside the one you least prefer.

□ _______________  ○ _______________  * _______________
### TEMPLATES

**Record Sheet**
**Preference Ranking Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>1st choice</th>
<th>2nd choice</th>
<th>3rd choice</th>
<th>Score</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each tester place a tick ✓ in the box that corresponds to their choice for that product.

**Score Value Assigned:**
- 1st choice give 3 points
- 2nd choice give 2 points
- 3rd choice give 1 point
DIFFERENCE TEST

Paired Comparison Test
This test is useful when comparing two types of the same food e.g. baked beans, yoghurt, juice etc. There are two different types of paired comparison test:

- Simple difference paired comparison test - are the samples different?
- Directional paired comparison test - which sample is sweeter / saltier?

Simple Difference Paired Comparison Test

- Tester is presented with two coded samples
- Tester is asked if there is a difference between the samples

Procedure for a Simple Difference Paired Comparison Test

Aim: To determine if testers can detect a difference between two samples of Baked Beans.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 12 containers
- 6 samples of food A – Baked Beans
- 6 samples of food B – Reduced Sugar Baked Beans
- 6 scorecards
- 6 record sheets

Procedure
1. Code 12 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○

2. Set up trays numbered 1 – 6. Place one container with symbol □ and one container with symbol ○ on each tray.
3. Arrange beans in containers. It is important to present the coded samples in random order on each tray. The samples on the trays can be the same or different. A possible presentation order for six testers is illustrated below.

**Presentation Order for Six Trays**

<table>
<thead>
<tr>
<th>Tray</th>
<th>AB</th>
<th>Tray</th>
<th>BA</th>
<th>Tray</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O</td>
<td>2</td>
<td>O</td>
<td>3</td>
<td>O</td>
</tr>
<tr>
<td>4</td>
<td>O</td>
<td>5</td>
<td>O</td>
<td>6</td>
<td>O</td>
</tr>
</tbody>
</table>

A - Baked Beans  
B - Reduced Sugar Baked Beans

4. Instruct testers to follow instructions on scorecard.

**Scorecard**  
**Simple Difference Paired Comparison Test**

Tray number ........ Name .................................................................

You are presented with two coded samples. Please taste the samples in the order given. Can you detect a difference between the samples?

Yes _______________  No _______________

Note: the taste order is always specified on the scorecard for a simple difference paired comparison test to ensure random tasting of food.
5. Collect scorecards and transfer results onto record sheet.

<table>
<thead>
<tr>
<th>Record Sheet</th>
<th>Simple Difference Paired Comparison Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Product A</strong>: Baked Beans</td>
<td></td>
</tr>
<tr>
<td><strong>Food Product B</strong>: Reduced Sugar Baked Beans</td>
<td></td>
</tr>
</tbody>
</table>

When recording results, transfer responses from the scorecards by indicating whether testers answered Yes or No. Tick ✓ those that are correct.

<table>
<thead>
<tr>
<th>Tester 1</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>□</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 2</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>□</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 3</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>□</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 4</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>□</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 5</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food sample</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>□</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 6</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>□</td>
<td>O</td>
</tr>
</tbody>
</table>

**Total number of correct responses**: 4

6. Count the correct responses.

7. Reveal codes and present results.
   As you can see, four testers correctly detected a difference between the two samples.

8. Evaluate results.
TEMPLATES

Scorecard
Simple Difference Paired Comparison Test

Tray number  .............  Name  .................................................................

You are presented with two coded samples. Please taste the samples in the order given. Can you detect a difference between the samples?

Yes  ______________  No  ______________

Scorecard
Simple Difference Paired Comparison Test

Tray number  .............  Name  .................................................................

You are presented with two coded samples. Please taste the samples in the order given. Can you detect a difference between the samples?

Yes  ______________  No  ______________

Scorecard
Simple Difference Paired Comparison Test

Tray number  .............  Name  .................................................................

You are presented with two coded samples. Please taste the samples in the order given. Can you detect a difference between the samples?

Yes  ______________  No  ______________
TEMPLATES

Record Sheet
Simple Difference Paired Comparison Test

Food Product A: 

Food Product B: 

When recording results, transfer responses from the scorecards by indicating whether testers answered Yes or No. Tick ✓ those that are correct.

<table>
<thead>
<tr>
<th>Tester 1</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 2</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 3</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 4</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 5</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food sample</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 6</th>
<th>Response</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

Total number of correct responses

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DIFFERENCE TEST

Paired Comparison Test
This test is useful when comparing two types of the same food e.g. baked beans, yoghurt, juice etc.
There are two different types of paired comparison test:
- Simple difference paired comparison test - are the samples different?
- Directional paired comparison test - which sample is sweeter / saltier?

Directional Paired Comparison Test

- Tester is present with two coded samples
- Tester is asked to determine which of the samples has a greater degree of intensity in terms of a particular characteristic

Procedure for a Directional Paired Comparison Test

Aim: To determine which of two samples of Orange Juice is sweeter.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 12 containers
- 6 samples of food A – Unsweetened Orange Juice
- 6 samples of food B – Sweetened Orange Juice
- 6 scorecards
- 6 record sheets

Procedure
1. Code 12 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○

2. Set up trays numbered 1 – 6. Place one container with symbol □ and one with symbol ○ on each tray.
3. Arrange orange juice in containers. It is important to present the coded samples in random order on each tray. A possible presentation order for six testers is illustrated below.

**Presentation Order for Six Trays**

```
Tray  AB
1    □ O

Tray  BA
2    □ O

Tray  AB
3    □ O

Tray  BA
4    □ O

Tray  AB
5    □ O

Tray  BA
6    □ O
```

A - Unsweetened Orange Juice  
B - Sweetened Orange Juice

4. Instruct testers to follow instructions on scorecard.

**Scorecard**  
 **Directional Paired Comparison Test**

Tray number .......... Name ..........................................................

In front of you are two coded samples.  
Starting with the sample on the left, taste each sample and circle the sample that is sweeter.  
You must make a choice. You may re-taste as often as you wish.

□ ○

Note: the taste order is always specified on the scorecard for a directional paired comparison test to ensure random tasting of food.
5. Collect scorecards and transfer results onto record sheet.

### Record Sheet
**Directional Paired Comparison Test**

<table>
<thead>
<tr>
<th>Tester 1</th>
<th>Food product</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>[ ]</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 2</th>
<th>Food product</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>[ ]</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 3</th>
<th>Food product</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>[ ]</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 4</th>
<th>Food product</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>[ ]</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 5</th>
<th>Food product</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>[ ]</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 6</th>
<th>Food product</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>[ ]</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

**Total number of correct responses** 4


7. Reveal codes and present results.
   Four people correctly identified the Sweetened Orange Juice as being the sweeter sample.

8. Evaluate results.
TEMPLATES

Scorecard
Directional Paired Comparison Test

Tray number ................ Name .................................................................

In front of you are two coded samples.
Starting with the sample on the left, taste each sample and circle the sample that is __________.
You must make a choice. You may re-taste as often as you wish.

☐ ☐

Scorecard
Directional Paired Comparison Test

Tray number ................ Name .................................................................

In front of you are two coded samples.
Starting with the sample on the left, taste each sample and circle the sample that is __________.
You must make a choice. You may re-taste as often as you wish.

☐ ☐

Scorecard
Directional Paired Comparison Test

Tray number ................ Name .................................................................

In front of you are two coded samples.
Starting with the sample on the left, taste each sample and circle the sample that is __________.
You must make a choice. You may re-taste as often as you wish.

☐ ☐
# Record Sheet

## Directional Paired Comparison Test

**Food Product A:** ________________

**Food Product B:** ________________

When recording results, circle the letter that corresponds with the symbol selected on the scorecard. Tick ✓ the correct responses.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tester 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
<tr>
<td><strong>Tester 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
<tr>
<td><strong>Tester 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
<tr>
<td><strong>Tester 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
<tr>
<td><strong>Tester 5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
<tr>
<td><strong>Tester 6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
</tr>
</tbody>
</table>

**Total number of correct responses**
DIFFERENCE TEST

Triangle Test
The triangle test is used to see if there is a detectable difference between two similar products.

Triangle Test
- Tester is presented with three coded samples
- Two samples are the same, one is different
- Tester is asked to identify the sample that is different

Procedure for a Triangle Test

Aim: To find out if there is a detectable difference between two brands of Jaffa Cakes.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 18 containers
- 9 samples of food A - White Pack Jaffa Cakes
- 9 samples of food B - Blue Pack Jaffa Cakes
- 6 scorecards
- 6 record sheets

Procedure
1. Code 18 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○
   - 6 containers with symbol ∗

2. Set up trays numbered 1 - 6. Place one container with symbol □, one with symbol ○ and one with symbol ∗ on each tray.
3. Arrange the food samples in each container. In a triangle test “Balanced Presentation Order” is important. This means that:
(i) every possible combination of samples should be presented
(ii) each food being tested is offered an equal number of times.

In a triangle test there are six possible combinations that can be presented. The six combinations are illustrated below.

**Balanced Presentation Order for Six Trays**

<table>
<thead>
<tr>
<th>Tray</th>
<th>ABA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>□ O *</td>
</tr>
<tr>
<td>2</td>
<td>□ O *</td>
</tr>
<tr>
<td>3</td>
<td>□ O *</td>
</tr>
<tr>
<td>4</td>
<td>BAB</td>
</tr>
<tr>
<td>5</td>
<td>□ O *</td>
</tr>
<tr>
<td>6</td>
<td>□ O *</td>
</tr>
</tbody>
</table>

A - White Pack Jaffa Cakes
B - Blue Pack Jaffa Cakes

On tray 1:
- food container □ contains White Pack Jaffa Cakes
- food container O contains Blue Pack Jaffa Cakes
- food container * contains White Pack Jaffa Cakes.

By setting up six trays one can ensure that every possible combination of samples is offered. The samples are also presented in **random order** and no tester gets the samples presented in the same sequence. Each food sample is offered an equal number of times i.e. nine times, so a **balanced presentation order** is achieved. It is important to note that the **codes on each tray remain the same**; it is the **food in the container that changes** each time.

4. Instruct testers to follow instructions on scorecard.

**Scorecard**

**Triangle Test**

Tray number ................ Name .................................................................

In front of you are three coded samples, two are the same and one is different. Starting from the left, taste the samples and circle the one that is different from the other two. You may re-taste the samples. You must make a choice.

□   ○   *

Note: the taste order is always specified on the scorecard for a triangle test to ensure random tasting of foods.
5. Collect scorecards and transfer results onto the record sheet.

<table>
<thead>
<tr>
<th>Tester 1</th>
<th>Food product</th>
<th>A</th>
<th>B</th>
<th>A</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 2</th>
<th>Food product</th>
<th>A</th>
<th>A</th>
<th>B</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 3</th>
<th>Food product</th>
<th>B</th>
<th>B</th>
<th>A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 4</th>
<th>Food product</th>
<th>B</th>
<th>A</th>
<th>B</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 5</th>
<th>Food product</th>
<th>A</th>
<th>B</th>
<th>B</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 6</th>
<th>Food product</th>
<th>B</th>
<th>A</th>
<th>A</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Total number of correct responses 5


7. Reveal codes and present results.
   In this case five out of six people correctly identified the sample that was different.

8. Evaluate results.
TEMPLATES

Scorecard
Triangle Test

Tray number .............. Name .................................................................

In front of you are three coded samples, two are the same and one is different. Starting from the left, taste the samples and circle the one that is different from the other two. You may re-taste the samples. You must make a choice.

□ ☐ *

Scorecard
Triangle Test

Tray number .............. Name .................................................................

In front of you are three coded samples, two are the same and one is different. Starting from the left, taste the samples and circle the one that is different from the other two. You may re-taste the samples. You must make a choice.

□ ☐ *

Scorecard
Triangle Test

Tray number .............. Name .................................................................

In front of you are three coded samples, two are the same and one is different. Starting from the left, taste the samples and circle the one that is different from the other two. You may re-taste the samples. You must make a choice.

□ ☐ *
# Sensory Analysis Teacher’s Manual

**Record Sheet**

**Triangle Test**

**Food Product A:** _______________________

**Food Product B:** _______________________

When recording the results circle the letter that corresponds with the symbol selected on each scorecard. 
Tick ✓ the appropriate column if the tester correctly identified the sample that was different.

<table>
<thead>
<tr>
<th>Tester 1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 2</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 3</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 4</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 5</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 6</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>B</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>☐</td>
<td>O</td>
<td>*</td>
</tr>
</tbody>
</table>

**Total number of correct responses:**
DIFFERENCE TEST

Duo-Trio Test
The duo-trio test is an alternative to the triangle test. This test is used in the food industry when changes are contemplated in a product currently available. This test is particularly useful when the product concerned has an intense odour or taste.

Duo-Trio Test

- Tester is presented with three samples
- Two samples are coded and one is identified as the reference. In industry the reference is normally the product currently being manufactured
- Tester is asked to identify the sample that is different from the reference

Procedure for a Duo-Trio Test

Aim: To find out if there is a detectable difference in taste between an Original Garlic Dip recipe and a Modified Garlic Dip recipe.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 18 containers
- 12 samples of food A – Original Garlic Dip recipe
- 6 samples of food B – Modified Garlic Dip recipe
- 6 scorecards
- 6 record sheets

Procedure
1. Code 18 containers as follows:
   - 6 containers with symbol R
   - 6 containers with symbol O
   - 6 containers with symbol ⋆

2. Set up trays numbered 1 - 6. Place one container with symbol R, one with symbol O and one with symbol ⋆ on each tray.
3. Arrange the food in the containers on each tray. It is important to present the food in a random order on each tray. A possible presentation order for six testers is illustrated below.

Presentation Order for Six Trays

<table>
<thead>
<tr>
<th>Tray</th>
<th>AAB</th>
<th>Trays</th>
<th>ABA</th>
<th>Trays</th>
<th>AAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RO</td>
<td>2</td>
<td>RO</td>
<td>3</td>
<td>RO</td>
</tr>
<tr>
<td>4</td>
<td>RO</td>
<td>5</td>
<td>RO</td>
<td>6</td>
<td>RO</td>
</tr>
</tbody>
</table>

R - Original recipe
A - Original recipe
B - Modified recipe

The codes on each tray remain the same. It is the food in the container that changes each time. The food placed in the container coded R is always the reference food, in this case the Original Garlic Dip recipe. Only the foods in the containers coded O and * change.

4. Instruct testers to follow instructions on scorecard.

Scorecard
Duo-Trio Test

Tray number .............. Name .................................................................

You are presented with three samples, one marked R and two other coded samples. Starting from the left, taste the R sample followed by the two coded samples in the order given. Circle the sample that is different from R. You may retaste the samples. You must make a choice.

R O *

R O *
5. Collect scorecards and transfer results onto record sheet.

### Record Sheet

**Duo-Trio Test**

**Food Product A:** Original Garlic Dip  
**Food Product B:** Modified Garlic Dip

When recording the results circle the letter that corresponds with the symbol selected on each scorecard. Tick ✓ the appropriate column if the tester correctly identified the sample that was *different* from R.

<table>
<thead>
<tr>
<th>Tester</th>
<th>Food product</th>
<th>Code</th>
<th>✓</th>
<th>If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>R</td>
<td></td>
<td>![Circle]</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>O</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>R</td>
<td>![Circle]</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>O</td>
<td></td>
<td>![Circle]</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>R</td>
<td>![Circle]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>O</td>
<td></td>
<td>![Circle]</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>R</td>
<td>![Circle]</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>O</td>
<td></td>
<td>![Circle]</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>R</td>
<td>![Circle]</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>O</td>
<td></td>
<td>![Circle]</td>
</tr>
<tr>
<td>6</td>
<td>A</td>
<td>R</td>
<td>![Circle]</td>
<td>![Circle]</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>O</td>
<td></td>
<td>![Circle]</td>
</tr>
</tbody>
</table>

**Total number of correct responses:** 4


7. Reveal codes and present results.  
   In this case four testers could identify the sample that was different from the reference.

8. Evaluate results.
TEMPLATES

Scorecard
Duo-Trio Test

Tray number ............ Name .................................................................

You are presented with three samples, one marked R and two other coded samples. Starting from the left, taste the R sample followed by the two coded samples in the order given. Circle the sample that is different from R. You may retaste the samples. You must make a choice.

R O *

Scorecard
Duo-Trio Test

Tray number ............ Name .................................................................

You are presented with three samples, one marked R and two other coded samples. Starting from the left, taste the R sample followed by the two coded samples in the order given. Circle the sample that is different from R. You may retaste the samples. You must make a choice.

R O *

Scorecard
Duo-Trio Test

Tray number ............ Name .................................................................

You are presented with three samples, one marked R and two other coded samples. Starting from the left, taste the R sample followed by the two coded samples in the order given. Circle the sample that is different from R. You may retaste the samples. You must make a choice.

R O *
**TEMPLATE**

**Record Sheet**
**Duo-Trio Test**

**Food Product A:**

**Food Product B:**

When recording the results circle the letter that corresponds with the symbol selected on each scorecard.
Tick ✓ the appropriate column if the tester correctly identified the sample that was *different* from R.

<table>
<thead>
<tr>
<th>Tester 1</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 2</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 3</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 4</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 5</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester 6</th>
<th>✓ If Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food product</td>
<td>A</td>
</tr>
<tr>
<td>Code</td>
<td>R</td>
</tr>
</tbody>
</table>
DESCRIPTIVE TEST

Descriptive Ranking Test
A descriptive ranking test is used to rank foods in order of intensity of a specific sensory attribute. A sensory attribute is the term used to describe a key characteristic of a food product e.g. sweetness, saltiness, aroma / flavour, rancidity, viscosity.

**Descriptive Ranking Test**

- Tester is presented with a number of coded samples
- Tester ranks samples in order of intensity of specified attribute/s

Procedure for a Descriptive Ranking Test

**Aim:** To rank the perceived creaminess of three types of Milk.

**Materials required based on six testers**

- 6 trays
- 6 glasses of water
- 18 containers
- 6 samples of food A - Full Fat Milk
- 6 samples of food B - Low Fat Milk
- 6 samples of food C - Skimmed Milk
- 6 scorecards
- 6 record sheets

**Procedure**

1. Code 18 containers as follows:
   - 6 containers with symbol □
   - 6 containers with symbol ○
   - 6 containers with symbol ★

2. Arrange milk in containers:
   - 6 coded □ - Full Fat Milk
   - 6 coded ○ - Low Fat Milk
   - 6 coded ★ - Skimmed Milk

3. Set up trays numbered 1 - 6. Place one container with symbol □, one with symbol ○ and one with symbol ★ on each tray.
4. Instruct the testers to follow instructions on scorecard.

Scorecard
Descriptive Ranking Test

Tray number ........................ Name .................................................................

In front of you are three coded samples. Taste each sample.
Please rank the samples in order of creaminess by placing:

1st choice beside the sample that you consider to be the creamiest
2nd choice beside the next creamiest
3rd choice beside the least creamy.

□ ____________  ○ ____________  * ____________

5. Collect scorecards and transfer results onto record sheet.

6. Calculate results.
   To calculate the results assign each choice a score value:
   1st choice give 3 points
   2nd choice give 2 points
   3rd choice give 1 point.
   Calculate the score for each product by multiplying the number of ticks in each box by the value assigned to that choice as in the record sheet below. The rank order is determined from the score.

Record Sheet
Descriptive Ranking Test

Food Product □ Full Fat Milk
Food Product ○ Low Fat Milk
Food Product * Skimmed milk

For each tester place a tick ✓ in the box that corresponds to their choice for that product.

Score Value Assigned:
    1st choice give 3 points
    2nd choice give 2 points
    3rd choice give 1 point

<table>
<thead>
<tr>
<th>Food Product</th>
<th>1st choice</th>
<th>2nd choice</th>
<th>3rd choice</th>
<th>Score</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓</td>
<td>1x1=1</td>
<td>13 points</td>
</tr>
<tr>
<td></td>
<td>2x3=6</td>
<td>3x2=6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>2x1=2</td>
<td>12 points</td>
</tr>
<tr>
<td></td>
<td>2x3=6</td>
<td>2x2=4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
<td>3x1=3</td>
<td>11 points</td>
</tr>
<tr>
<td></td>
<td>2x3=6</td>
<td>1x2=2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Reveal codes and present results.
   In the above example the product coded □ was perceived to be the creamiest milk. This was the Full Fat Milk.

8. Evaluate results.
TEMPLATES

Scorecard
Descriptive Ranking Test

Tray number ............ Name ...........................................................................

In front of you are three coded samples. Taste each sample.
Please rank the samples in order of ____________ by placing:
   1st choice beside the sample that you consider to be the ____________
   2nd choice beside the next ____________
   3rd choice beside the least ____________

☐ ____________  ○ ____________  * ____________

Scorecard
Descriptive Ranking Test

Tray number ............ Name ...........................................................................

In front of you are three coded samples. Taste each sample.
Please rank the samples in order of ____________ by placing:
   1st choice beside the sample that you consider to be the ____________
   2nd choice beside the next ____________
   3rd choice beside the least ____________

☐ ____________  ○ ____________  * ____________

Scorecard
Descriptive Ranking Test

Tray number ............ Name ...........................................................................

In front of you are three coded samples. Taste each sample.
Please rank the samples in order of ____________ by placing:
   1st choice beside the sample that you consider to be the ____________
   2nd choice beside the next ____________
   3rd choice beside the least ____________

☐ ____________  ○ ____________  * ____________

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## TEMPLATES

### Record Sheet

**Descriptive Ranking Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>1st choice</th>
<th>2nd choice</th>
<th>3rd choice</th>
<th>Score</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each tester place a tick ✓ in the box that corresponds to their choice for that product.

**Score Value Assigned:**

1st choice give 3 points
2nd choice give 2 points
3rd choice give 1 point

---

### Record Sheet

**Descriptive Ranking Test**

<table>
<thead>
<tr>
<th>Food Product</th>
<th>1st choice</th>
<th>2nd choice</th>
<th>3rd choice</th>
<th>Score</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each tester place a tick ✓ in the box that corresponds to their choice for that product.

**Score Value Assigned:**

1st choice give 3 points
2nd choice give 2 points
3rd choice give 1 point
DESCRIPTIVE TEST

Descriptive Rating Tests
Descriptive rating tests are used to evaluate and rate pre-selected sensory attributes in a food. A sensory attribute is the term used to describe a key characteristic of a food product. The attributes can be rated on line scales or star diagrams. A sensory profile is a written description of the sensory attributes of a food. This is compiled from the ratings obtained for the selected attributes.

Descriptive Rating Test – profiling one product using line scales.

- Tester is presented with one food sample
- Tester is asked to rate the intensity of the pre-selected attributes for the sample

Procedure for a Descriptive Rating Test

Aim: To compile a sensory profile of one type of Tomato Soup using four pre-selected attributes.

Materials required based on six testers
- 6 trays
- 6 glasses of water
- 6 containers
- 6 samples of Tomato Soup
- 6 scorecards
- 6 record sheets

Procedure
1. Agree four attributes to be rated. This is an important stage in the test and can be done by brainstorming / discussion within the class group. Each student should have a clear understanding of the meaning of each chosen attribute.

   The four attributes agreed for the tomato soup are:
   - aroma
   - colour (tomato colour)
   - flavour (tomato flavour)
   - sweetness (sweet).

2. Label scorecard and record sheet with agreed attributes.
3. Set up trays numbered 1 – 6. Place a sample of soup on each tray.

4. Instruct testers to follow instructions on scorecard.

<table>
<thead>
<tr>
<th>Scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Rating Test - one product</td>
</tr>
</tbody>
</table>

Tray number .......... Name ..............................................................

You are presented with a sample of Tomato Soup. Please evaluate and rate the sample for each attribute and mark the number that best describes your choice on the accompanying line scale.

1 = very weak  2 = weak  3 = neither weak nor strong  4 = strong  5 = very strong

Attributes

**Aroma**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

**Tomato Flavour**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

**Tomato Colour**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

**Sweetness**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>
5. Collect scorecards and transfer results onto record sheet.

6. Calculate the average score for each attribute.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Aroma</th>
<th>Tomato Flavour</th>
<th>Tomato Colour</th>
<th>Sweetness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Product:</strong> Tomato Soup</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Record Sheet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Descriptive Rating Test - one product</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Tester 1                     | 5     | 3              | 3             | 2         |
| Results from scorecard       |       |                |               |           |

| Tester 2                     | 4     | 3              | 2             | 3         |
| Results from scorecard       |       |                |               |           |

| Tester 3                     | 4     | 5              | 1             | 3         |
| Results from scorecard       |       |                |               |           |

| Tester 4                     | 5     | 4              | 2             | 3         |
| Results from scorecard       |       |                |               |           |

| Tester 5                     | 3     | 4              | 2             | 2         |
| Results from scorecard       |       |                |               |           |

| Tester 6                     | 3     | 3              | 2             | 1         |
| Results from scorecard       |       |                |               |           |

| **Total score**              | 24    | 22             | 12            | 14        |

| **Average score**            | 4     | 3.6            | 2             | 2.3       |
| (total score ÷ number of testers) |       |                |               |           |
7. Present results by plotting the average score for each attribute on to the line scales. It is acceptable to round off average scores to the nearest whole number.

<table>
<thead>
<tr>
<th>Presentation of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Rating Test - one product</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tray number</th>
<th>Name</th>
</tr>
</thead>
</table>

Food Product: Tomato Soup

Please plot the average score for each attribute on the accompanying line scales.

1 = very weak  
2 = weak  
3 = neither weak nor strong  
4 = strong  
5 = very strong

Attributes

**Aroma**

```
| 1 | 2 | 3 | 4 | 5 |
```

**Tomato Flavour**

```
| 1 | 2 | 3 | 4 | 5 |
```

**Tomato Colour**

```
| 1 | 2 | 3 | 4 | 5 |
```

**Sweetness**

```
| 1 | 2 | 3 | 4 | 5 |
```

8. Compile a sensory profile of the tomato soup based on the group result. For accurate profiling it is important to use the appropriate words for each number on the scales.

**Profile of Tomato Soup**

This soup has a strong aroma and a strong tomato flavour. However, it has a weak tomato colour and a weak sweet taste.

9. Evaluate results.
Scorecard
Descriptive Rating Test - one product

Tray number …………… Name ………………………………………………………………………

You are presented with a sample of ______________

Please evaluate and rate the sample for each attribute and mark the number that best describes your choice on the accompanying line scale.

1 = very weak  2 = weak  3 = neither weak nor strong  4 = strong  5 = very strong

Attributes

……………………

……………………

……………………

……………………
### Record Sheet
**Descriptive Rating Test - one product**

<table>
<thead>
<tr>
<th>Food Product: __________________________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Fill in attributes selected for profile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tester 1**
Results from scorecard

**Tester 2**
Results from scorecard

**Tester 3**
Results from scorecard

**Tester 4**
Results from scorecard

**Tester 5**
Results from scorecard

**Tester 6**
Results from scorecard

**Total score**

**Average score**
(total score ÷ number of testers)
TEMPLATE

Presentation of Results
Descriptive Rating Test - one product

Tray number ............  Name .................................................................

Food Product: _________________

Please plot the average score for each attribute on the accompanying line scales.

1 = very weak  2 = weak  3 = neither weak nor strong  4 = strong  5 = very strong

Attributes

..........................

| 1 | 2 | 3 | 4 | 5 |

..........................

| 1 | 2 | 3 | 4 | 5 |

..........................

| 1 | 2 | 3 | 4 | 5 |

..........................

| 1 | 2 | 3 | 4 | 5 |
DESCRIPTIVE TESTS

Descriptive Rating Tests
Descriptive rating tests are used to evaluate and rate pre-selected sensory attributes in a food. A sensory attribute is the term used to describe a key characteristic of a food product. The attributes can be rated on line scales or star diagrams. A sensory profile is a written description of the sensory attributes of a food. This is compiled from the ratings obtained for the selected attributes.

Descriptive Rating Test – profiling two products using star diagrams.

<table>
<thead>
<tr>
<th>Descriptive Rating Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Tester is presented with two coded samples</td>
</tr>
<tr>
<td>• Tester is asked to rate the intensity of the pre-selected attributes for each sample</td>
</tr>
</tbody>
</table>

Procedure for a Descriptive Rating Test using two products
Aim: To compile a sensory profile of each of two types of Fruit Scones using six pre-selected attributes.

Materials required based on four testers
- 4 trays
- 4 glasses of water
- 8 containers
- 4 samples of Fruit Scone A
- 4 samples of Fruit Scone B
- 4 scorecards
- 4 record sheets

Procedure
1. Agree six attributes. This is an important stage in the test and can be done by brainstorming or discussion within the class group. Each student should have a clear understanding of the meaning of the chosen attribute.

The six attributes agreed for the scones are:
- colour (golden brown)
- shape (even)
- lightness (light)
- sweetness (sweet)
- fruitiness (fruity)
- crumbliness (crumbly).
2. Label the scorecard and record sheet with the selected attributes. It is important that all scorecards have the attributes labelled at the exact same point on the star diagram. Begin labelling by writing the first attribute at the “12 o’clock position” and then move clockwise around the star by inserting the remaining attributes in sequence.

3. Code 8 containers as follows:
   - 4 containers with symbol □
   - 4 containers with symbol ○

4. Arrange food in the containers:
   - 4 coded □ - Fruit Scone A
   - 4 coded ○ - Fruit Scone B

5. Set up trays numbered 1 - 4. Place one container with symbol □ and one container with symbol ○ on each tray.
6. Instruct testers to follow instructions on scorecard.

Scorecard
Descriptive Rating Test – two products

Tray number ……………… Name ……………………………………………………………

You are presented with two coded samples. Beginning with sample □, evaluate and rate the attributes from 0 - 5 using the star diagram coded □. Begin with the visual attributes. Then taste the product.
Repeat the same process with sample coded ○.
Join the dots to complete each star diagram.

Food Product □ ___________________________ Food Product ○ ___________________________

Star diagram coded □

Golden brown
Fruity
Crumbly
Even shape
Sweet

Golden brown
Fruity
Crumbly
Even shape
Sweet

Even shape

0 = not at all 1 = weak 2 = fairly 3 = moderate 4 = quite 5 = very
7. Collect scorecards and transfer each tester’s result onto the record sheet. Each tester should first of all transfer their own results from each star diagram on to the appropriate places on their own record sheet. They must then transfer the results of each tester in their group onto the record sheet. Average scores for each attribute are then calculated.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Golden Brown</th>
<th>Light</th>
<th>Sweet</th>
<th>Even Shape</th>
<th>Crumbly</th>
<th>Fruity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tester 1</strong>&lt;br&gt;Results from star diagram</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Tester 2</strong>&lt;br&gt;Results from star diagram</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Tester 3</strong>&lt;br&gt;Results from star diagram</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Tester 4</strong>&lt;br&gt;Results from star diagram</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total score</strong></td>
<td>14</td>
<td>18</td>
<td>15</td>
<td>17</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td><strong>Average score</strong>&lt;br&gt;(total score ÷ number of testers)</td>
<td>3.5</td>
<td>4.5</td>
<td>3.75</td>
<td>4.25</td>
<td>2</td>
<td>4.25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Golden Brown</th>
<th>Light</th>
<th>Sweet</th>
<th>Even Shape</th>
<th>Crumbly</th>
<th>Fruity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tester 1</strong>&lt;br&gt;Results from star diagram</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Tester 2</strong>&lt;br&gt;Results from star diagram</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Tester 3</strong>&lt;br&gt;Results from star diagram</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Tester 4</strong>&lt;br&gt;Results from star diagram</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total score</strong></td>
<td>15</td>
<td>11</td>
<td>18</td>
<td>12</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td><strong>Average score</strong>&lt;br&gt;(total score ÷ number of testers)</td>
<td>3.75</td>
<td>2.75</td>
<td>4.5</td>
<td>3</td>
<td>2.5</td>
<td>4.75</td>
</tr>
</tbody>
</table>
8. Present results by plotting the average scores from the record sheet onto the group star diagram. It is acceptable to round off average scores to the nearest whole number.

**Presentation of Results**  
**Descriptive Rating Test – two products**

Tray number .................. Name ......................................................................................

For each product please plot the average score for each attribute on the star diagram. Use a different colour pen for each product.

**Group Star Diagram**

```
0 = not at all   1 = weak   2 = fairly   3 = moderate   4 = quite   5 = very
```

- Food Product □ ________________
- __________ Food Product ○ ________________
9. Compile a sensory profile for each product based on the group results.
   For accurate profiling it is important to use the appropriate words for each number on the star
diagram.

   Profile of Fruit Scone □
   This fruit scone is quite golden brown. It is very light and is quite sweet. It has quite an even shape,
is fairly crumbly and quite fruity.

   Profile of Fruit Scone ○
   This fruit scone is also quite golden brown. It is moderately light and is very sweet. It has a
moderately even shape, is moderately crumbly and very fruity.

10. Reveal codes.

11. Evaluate results.
Scorecard
Descriptive Rating Test – two products

Tray number ..................  Name ..........................................................

You are presented with two coded samples. Beginning with sample □, evaluate and rate the attributes from 0 - 5 using the star diagram coded □. Begin with the visual attributes. Then taste the product. Repeat the same process with sample coded ○. Join the dots to complete each star diagram.

Food Product □ __________________________  Food Product ○ __________________________

Star diagram coded □  Star diagram coded ○

0 = not at all  1 = weak  2 = fairly  3 = moderate  4 = quite  5 = very
### Record Sheet
#### Descriptive Rating Test – two products

**Food Product** □  
Collate the results from the scorecards in your group.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Fill in attributes selected for profile</th>
</tr>
</thead>
</table>

**Tester 1**  
Results from star diagram

**Tester 2**  
Results from star diagram

**Tester 3**  
Results from star diagram

**Tester 4**  
Results from star diagram

<table>
<thead>
<tr>
<th>Total score</th>
</tr>
</thead>
</table>

| Average score  
(total score ÷ number of testers) |
|-----------------------------------|

**Food Product** ☐  
Collate the results from the scorecards in your group.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Fill in attributes selected for profile</th>
</tr>
</thead>
</table>

**Tester 1**  
Results from star diagram

**Tester 2**  
Results from star diagram

**Tester 3**  
Results from star diagram

**Tester 4**  
Results from star diagram

<table>
<thead>
<tr>
<th>Total score</th>
</tr>
</thead>
</table>

| Average score  
(total score ÷ number of testers) |
|-----------------------------------|
Presentation of Results
Descriptive Rating Test – two products

Tray number .................. Name ..........................................................

For each product please plot the average score for each attribute on the star diagram. Use a different colour pen for each product.

Group Star Diagram

0 = not at all  1 = weak  2 = fairly  3 = moderate  4 = quite  5 = very

Food Product □ ___________________
Food Product ○ ___________________

Profile of Food Product □
________________________________________________________________________
________________________________________________________________________

Profile of Food Product ○
________________________________________________________________________
________________________________________________________________________
### APPENDIX 1

**SUMMARY OF SENSORY ANALYSIS TESTS SUITABLE FOR THE CLASSROOM**

<table>
<thead>
<tr>
<th>Category</th>
<th>Tests</th>
<th>Number of Samples</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preference Tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paired Preference Test</td>
<td>2</td>
<td>To determine the preferred product.</td>
</tr>
<tr>
<td></td>
<td>Hedonic Rating Scale</td>
<td>1 or more</td>
<td>To find out how much a product is liked / disliked.</td>
</tr>
<tr>
<td></td>
<td>Food Action Rating Test</td>
<td>1 or more</td>
<td>To determine attitude by indicating degree of liking / disliking for a product.</td>
</tr>
<tr>
<td></td>
<td>Preference Ranking Test</td>
<td>2 or more</td>
<td>To rank products in order of preference.</td>
</tr>
<tr>
<td><strong>Difference Tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simple Difference</td>
<td>2</td>
<td>To determine if there is a difference between two samples.</td>
</tr>
<tr>
<td></td>
<td>Paired Comparison Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Directional Paired</td>
<td>2</td>
<td>To determine which of two samples has a greater degree of intensity in terms of a particular characteristic.</td>
</tr>
<tr>
<td></td>
<td>Comparison Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Triangle Test</td>
<td>3 samples - 2 are the same and 1 is different.</td>
<td>To identify the sample that is different.</td>
</tr>
<tr>
<td></td>
<td>Duo-Trio Test</td>
<td>3 samples - 2 are coded and 1 is identified as the control / reference.</td>
<td>To identify the sample that is different from the control / reference.</td>
</tr>
<tr>
<td><strong>Descriptive Tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Descriptive Ranking Test</td>
<td>2 or more</td>
<td>To rank samples of a product in order of intensity of specified attribute/s.</td>
</tr>
<tr>
<td></td>
<td>Descriptive Rating Test</td>
<td>1</td>
<td>To rate the intensity of pre-selected attributes for a food sample.</td>
</tr>
<tr>
<td></td>
<td>- one product</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Descriptive Rating Test</td>
<td>2</td>
<td>To rate the intensity of pre-selected attributes for each food sample.</td>
</tr>
<tr>
<td></td>
<td>- two products</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 2

SCALES

In sensory analysis many different types of scales are used. However, the choice of scale should be considered in light of the test objective.

TARGET GROUPS
Product development is frequently aimed at particular target groups. Simple scales are used to identify and collate this information.

Example 1 – Gender

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
</table>

Example 2 – Age Group

<table>
<thead>
<tr>
<th>15-25</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
</tr>
</thead>
</table>

Example 3 – Do you eat yoghurt?

<table>
<thead>
<tr>
<th>Do you eat yoghurt?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

RATING SCALES
Many sensory analysis tests require products to be assessed and then rated on some form of scale. The scale chosen depends on the aim of the test and the possible outcome. It is essential to choose an appropriate scale for the test. There are many different rating scales and some of them are interchangeable.

The following are examples of rating scales where the categories lie in a specific order. The scales may contain numbers, words, or a combination of both. The lowest number on the scale denotes "less of" and the highest number denotes "more of".

Example 1 - Numeric

<table>
<thead>
<tr>
<th>Not sweet</th>
<th>Extremely sweet</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
Example 2 - Verbal

<table>
<thead>
<tr>
<th>Not sweet</th>
<th>Slightly sweet</th>
<th>Moderately sweet</th>
<th>Very sweet</th>
<th>Extremely sweet</th>
</tr>
</thead>
</table>

Example 3 – Hedonic

Hedonic scales express degrees of like or dislike. The term hedonic means having to do with pleasure, so rating scales to do with likes or dislikes are called hedonic rating scales. Three commonly used hedonic scales are included below.

(a) Facial Hedonic Scale

Pictures are used to divide the scale.

![Facial Hedonic Scale](image)

(b) Numeric Hedonic Scale

Numbers are used to divide the scale. The scale is usually a five, seven or nine-point scale centred on a mid-point. In other words the scale always has an uneven number of points. When using this type of scale with students it would be important to keep the scale short. A five-point scale should be adequate.

![Numeric Hedonic Scale](image)
(c) Verbal Hedonic Scale
Words or phrases are used to divide the scale. The words / phrases chosen are used to indicate the degree of liking for the product. The scale is usually a five, seven or nine-point scale. When designing verbal scales for classroom use it is important to use words that are easily understood by students.

**Five-Point Verbal Hedonic Scale**

<table>
<thead>
<tr>
<th>Verbal Hedonic Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
</tr>
<tr>
<td>○</td>
</tr>
<tr>
<td>*</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Like very much</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like slightly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither like nor dislike</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike slightly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike very much</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Nine-Point Verbal Hedonic Scale**

<table>
<thead>
<tr>
<th>Verbal Hedonic Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
</tr>
<tr>
<td>○</td>
</tr>
<tr>
<td>*</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Like extremely</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like very much</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like moderately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like slightly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither like nor dislike</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike slightly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike moderately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike very much</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dislike extremely</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example 4: Line Scales
Line scales are usually represented as a horizontal line, with a low rating at the left-hand end of the line and a high rating at the right-hand end of the line.

**Single Line Scales**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>Weak</td>
<td>Moderate</td>
<td>Very</td>
<td>Extreme</td>
</tr>
</tbody>
</table>

**Series of Line Scales**

1 = very weak  2 = weak  3 = neither weak nor strong  4 = strong  5 = very strong

**Attributes**

**Aroma**

1 2 3 4 5

**Tomato Flavour**

1 2 3 4 5

**Tomato Colour**

1 2 3 4 5

**Sweetness**

1 2 3 4 5
Example 5 - Star Diagrams
Star diagrams are used to rate particular attributes of a food.

How to draw a star diagram

(i) Draw three or four lines (depending on the number of points required), intersecting at a central point.
(ii) Label points of the scale on each line. Keep the scale short. A five-point scale should be sufficient. For each attribute the relative intensity increases as it goes further from the centre point.
(iii) Label each line with the specific attribute being rated.
(iv) Place a dot on the number, on the appropriate line, that best describe each attribute.
(v) Join up the dots to make a star shape.

A Six-Point Star Diagram

[Diagram showing a six-point star diagram with attributes such as Golden brown, Fruity, Light, Crumbly, Sweet, and Even shape.]
APPENDIX 3

PRESENTATION OF RESULTS

Sensory analysis test results can be presented on pie charts, bar charts and scales such as star diagrams. The method of presentation will depend on the nature of the data collected and the type of analysis required.

**Pie Charts**

Pie charts are best suited to simple tests where the tester is carrying out one instruction only such as:

(i) which product is preferred
(ii) ranking products in order of preference.

A pie chart can be drawn by hand or using a computer programme. It is important to label the pie chart indicating a key for each product, the percentage result for each segment and the number of testers involved in the test. An exemplar is illustrated below.

![Pie Chart Indicating Preference for Three Drinks](image)

20 participants

The results indicate a slight preference for freshly squeezed orange juice and it is clear that the unsweetened orange juice is the least preferred.
Bar Charts
Bar charts can be used as an alternative to pie charts to present simple information. They can also be used to present more complex data.

A bar chart can be drawn by hand or using a computer programme. Both axes should be labelled. The number or percentage of testers should be shown clearly on the vertical axis. The products or characteristics of products being tested should be indicated on the horizontal axis. A key may be required to help identify the products. Exemplars are illustrated below.

Example 1

Results of Paired Preference Test

```
Shortbread

Preferences
100%
80%
60%
40%
20%
0%

Butter Margarine
```

This chart illustrates a preference for shortbread made with butter as opposed to shortbread made with margarine.

Example 2

Results of Descriptive Rating Test

```
Scones

Scores
5 4 3 2 1

Golden brown Even shape Sweet Light

Attributes
```

This chart illustrates the rating of four different attributes of two types of scones. Scone A is more even in shape and lighter than scone B. Scone B is sweeter and slightly browner than scone A.
Star Diagrams
While scales are generally used for rating (Appendix 2) they can also be used to present results. Star diagrams are particularly useful.

Star diagrams can be used to present data for one or more products. Further details on star diagrams are available on page 79. Exemplars are illustrated below. A profile can be compiled from the information presented on the star diagram.

Example 1 – Star Diagram for One Product

Descriptive Rating Test
Bread Roll

![Star Diagram](Image)

0 = poor  1 = weak  2 = slightly  3 = fairly  4 = quite  5 = very

Profile of Bread Roll
This bread roll has a very good brown colour. It is very crusty outside but is only slightly soft on the inside. It has quite a nutty flavour and is fairly sweet, but is also quite doughy.

Example 2 - Star Diagram for Two Products

Descriptive Rating Test – two products

![Star Diagram](Image)

0 = not at all  1 = weak  2 = fairly  3 = moderate  4 = quite  5 = very
# Appendix 4

## Glossary of Terms Used in Sensory Analysis

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>The visible attributes of a food.</td>
</tr>
<tr>
<td>Attribute</td>
<td>A perceived sensory characteristic of a food.</td>
</tr>
<tr>
<td>Balanced Presentation Order</td>
<td>Each food is presented an equal number of times and the samples are presented in random order.</td>
</tr>
<tr>
<td>Control</td>
<td>Sample of the product being tested is chosen as a reference point against which all others are compared.</td>
</tr>
<tr>
<td>Hedonic</td>
<td>Relating to like or dislike.</td>
</tr>
<tr>
<td>Hedonic Scale</td>
<td>Scales expressing degrees of like or dislike.</td>
</tr>
<tr>
<td>Organoleptic Assessment</td>
<td>Using the senses to evaluate food.</td>
</tr>
<tr>
<td>Profile</td>
<td>Description of the perceived sensory attributes of a food.</td>
</tr>
<tr>
<td>Random Order</td>
<td>The presentation order of samples on each tray is varied between testers.</td>
</tr>
<tr>
<td>Ranking</td>
<td>Food samples are placed in order according to preference or intensity of a specified attribute.</td>
</tr>
<tr>
<td>Rating</td>
<td>Food samples are scored according to the intensity of a specified attribute.</td>
</tr>
<tr>
<td>Record Sheet</td>
<td>Document used to compile results from a sensory analysis test.</td>
</tr>
<tr>
<td>Reference</td>
<td>Sample of the product being tested is chosen as a reference point against which all others are compared.</td>
</tr>
<tr>
<td>Scorecard</td>
<td>Sheet that testers use to answer the question/s asked in a sensory analysis test.</td>
</tr>
<tr>
<td>Tester</td>
<td>Person who evaluates foods and fills out a scorecard. This person may be trained or untrained.</td>
</tr>
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BIBLIOGRAPHY


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