Queensland Curriculum and Assessment Authority

# Food & Nutrition 2019 v1.1

## IA1: Sample assessment instrument

### Examination (20%)

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

**Student name**

**Student number**

**Teacher**

**Exam date**

## Marking summary

| Criterion | Marks allocated | Provisional marks |
|---|---|---|
| Recognising and explaining | 5 | |
| Analysing and determining | 6 | |
| Synthesising and evaluating | 9 | |
| **Overall** | 20 | |

# Conditions

| | |
|---|---|
| **Technique** | Examination |
| **Unit** | Unit 3: Food science of carbohydrate and fat |
| **Topic/s** | Topic 1: The food system<br>Topic 3: Fat<br>Topic 4: Developing food solutions |
| **Time** | 2 hours + 10 minutes perusal |
| **Seen/Unseen** | Unseen questions |

# Instructions

Students are to answer all questions on the exam paper in the space provided for each item.

The examination is divided into two parts:

- Part A — Short response (estimated duration 40 minutes). Short response questions require you to write in dot points, with some full sentences, constructing a response that may have one or more paragraphs so that ideas are maintained, developed and justified.
- Part B — Extended response (estimated duration 80 minutes). Extended response questions require you to write in full sentences, constructing a response that will have several paragraphs so that ideas are maintained, developed and justified.

# Stimulus

On separate A3 document

# Part A

**Question 1** **Up to 50-word response**

Explain the following terms related to the classification of fats, and give one food source example of each. (Write your response in dot points.)

| a) Monounsaturated fats | Example: |
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| b) Polyunsaturated fats | Example: |
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**Question 2** **Up to 50-word response**

Explain the effects on health of consuming foods that are high in saturated fat and trans fat. (Write your response in sentences.)

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| Question 3 | Up to 50-word response |
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A damaged carton of potato crisps has been found by a retailer. On opening the carton, the packets of crisps are deflated, and an unpleasant odour can be detected. The crisps are soft and crumbly.

Using your knowledge of processing and properties of fat, explain what chemical process caused the deterioration of the crisps. (Write your response in sentences.)

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| **Question 4** | **Up to 150-word response** |
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Read the following case study.

Australian company Classic Baking manufactures baked goods for the retail sector. The company recently received consumer feedback about the Classic Biscuit prototypes it plans to introduce into its current range.

Use the following information to analyse the food components and procedures related to the properties and processing of fat and then respond to the questions.

(Write your response in dot points and/or sentences.)

<table>
<tr><th colspan="3">Prototype formulations</th></tr>
<tr><th>Classic Biscuit formulation 1</th><th>Classic Biscuit formulation 2</th><th>Classic Biscuit formulation 3</th></tr>
<tr>
<td>Food components<br>200 g butter<br>250 g caster sugar<br>2.5 mL vanilla<br>1 egg<br>500 g plain flour<br>5 g baking powder<br><br>Procedure<br>1. Sift flour and baking powder.<br>2. Rub butter into the flour and baking soda.<br>3. Mix in sugar.<br>4. Add egg and vanilla, then mix until combined.<br>5. Roll mixture into balls.<br>6. Bake at 180 °C until browned.</td>
<td>Food components<br>125 g butter<br>125 g caster sugar<br>2.5 mL vanilla<br>1 egg<br>500 g plain flour<br>5 g baking powder<br><br>Procedure<br>1. Sift flour and baking powder.<br>2. Rub butter into the flour and baking soda.<br>3. Mix in sugar.<br>4. Add egg and vanilla, then mix until combined.<br>5. Roll mixture into balls.<br>6. Bake at 180 °C until lightly browned.</td>
<td>Food components<br>60 g butter<br>125 g brown sugar<br>5 mL vanilla<br>2 eggs<br>500 g plain flour<br>5 g baking powder<br><br>Procedure<br>1. Beat butter and sugar into a cream.<br>2. Add egg and vanilla, then mix until combined.<br>3. Sift flour and baking powder over butter mixture.<br>4. Stir until combined.<br>5. Roll mixture into balls.<br>6. Bake at 160 °C until lightly coloured.</td>
</tr>
<tr><th colspan="3">Consumer feedback</th></tr>
<tr><th>Classic Biscuit formulation 1</th><th>Classic Biscuit formulation 2</th><th>Classic Biscuit formulation 3</th></tr>
<tr>
<td>• Appearance — wide, golden but speckled with white dots<br>• Taste — sweet<br>• Flavour — very buttery and undercooked on inside<br>• Texture — too greasy but also grainy<br>• Aroma — buttery and sweet but acceptable</td>
<td>• Appearance — golden and well-shaped, speckled<br>• Taste — sweet<br>• Flavour — buttery<br>• Texture — short and grainy but with crisp texture<br>• Aroma — sweet and biscuity</td>
<td>• Appearance — small, risen with golden colour<br>• Taste — sweet<br>• Flavour — vanilla<br>• Texture — tough and chewy<br>• Aroma — vanilla</td>
</tr>
</table>

a) Explain the primary function of fat in the processing of biscuits. (Write your response in dot points.)

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b) Explain what effects the quantity of fat in each formulation will have on the finished product. (Write your response in dot points.)

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c) Use a sensory profiling method to graphically represent sensory attributes of each biscuit, which can be used to evaluate the quality of each prototype.

(Respond with a graphical representation in the space below.)

d) Analyse the processes and food components used in each formulation, and the sensory profiling data, to draw conclusions as to which is the most effective processing technique and appropriate combination of food components for a Classic Biscuit formulation. Justify your conclusions. (Write your response in dot points.)

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# Part B

| Question 5 | 400–700 word response |
|---|---|

The company Dressings and Spreads has decided to introduce one new product to its existing product range. It has developed three prototypes and the related data is in the stimulus material.

Use the stimulus material and the Food & Nutrition problem-solving process to document a solution.

In your response:

- analyse the stimulus material to recognise and explain the needs of the relevant stakeholders, consumer trends, and essential characteristics and constraints of the problem to determine the solution requirements
- determine solution criteria for the problem
- evaluate the feasibility of the solutions and use the solution criteria to determine your best possible solution
- make justified recommendations for refinements to food components or procedures for future enhancement.

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# Stimulus

## About Dressings and Spreads

The new company, Dressings and Spreads is committed to making quality, healthy, plant-based foods that target its niche market. Dressings and Spreads customers appreciate the contribution that high-quality, natural plant food components and simple processing techniques make to the flavour of food products, a healthy body and a cleaner environment. Due to its ethical stance on the use of preservatives and chemical or artificial additives, all food products made by Dressing and Spreads require refrigeration.

Consumer sensory profiling research has identified an opportunity to develop a line extension to its existing product lines. Current product lines include:

- Salad dressings — red chilli dressing, and sweet mustard dressing
- Nut spreads — roasted peanut spread, and cashew and coconut spread

The following three prototypes have been trialled: Pine Nut Dressing, Asian Peanut Salad Dressing and Coffee Almond Spread.

**Formulations of proposed line extensions**

**Formulation 1: Pine Nut Dressing**

**Food components**
125 g pine nuts
250 g water
80 mL cider vinegar
80 mL lemon juice
10 g mustard
100 g fresh parsley
4 cloves garlic
5 basil sprigs
115 g olive oil
5 g salt

**Procedure**
1. Blend the pine nuts in a food processor until finely ground.
2. Add the water, vinegar, lemon juice, parsley, garlic, basil and salt.
3. While the mixture is processing gradually add in oil and blend until smooth.

**Servings**
750 g or 25x 30 g

**Formulation 2: Asian Peanut Salad Dressing**

**Food components**
125 g peanuts
40 mL raw apple cider vinegar
80 mL coconut oil
80 mL lemon juice
2 knobs fresh ginger
1 fresh red chilli
40 mL soy sauce
4 cloves garlic
120 mL honey
4 g salt
240 mL water

**Procedure**
1. Put half of the peanuts in a food processor and blend lightly into small pieces then put them aside.
2. Combine all other ingredients in a food processor and blend until smooth. If the consistency is too viscous, add more water.
3. Add in the blended peanuts.

**Servings**
750 g or 25x 30 g

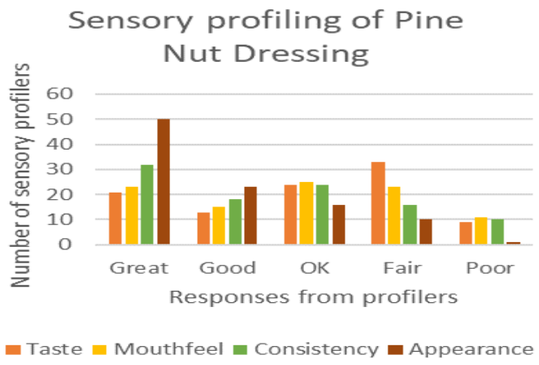
**Formulation 3: Coffee Almond Spread**

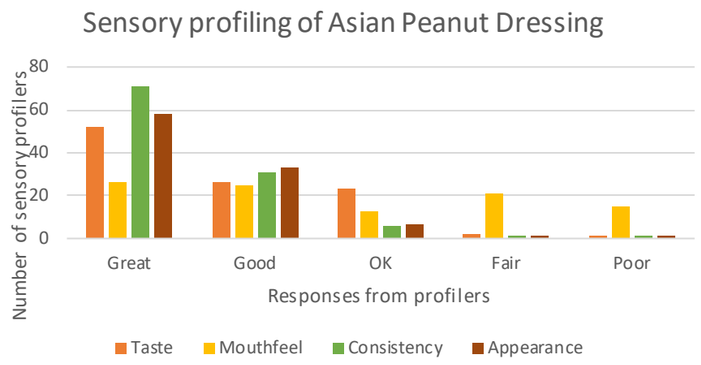
**Food components**
3 cups almonds
1 shot espresso

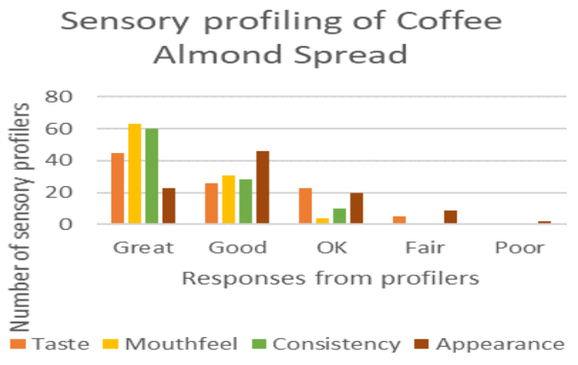
**Procedure**
1. Warm the almonds in an oven at 250 degrees for 10 to 15 minutes.
2. Blend the almonds in a food processor until they are creamy.
3. When the mixture is smooth, add the espresso in just before turning off the food processor.

**Servings**
700 g or 35x 20 g

**Sensory profiling data**



| Nutrition information panels — Formulation per 100 g | | | |
|---|---|---|---|
| **Nutrients** | **Pine Nut Dressing** | **Asian Peanut Salad Dressing** | **Coffee Almond Spread** |
| **Energy** | **427 kJ** | **257 kJ** | **1042 kJ** |
| **Carbohydrate** | **2g – 7%** | **23.6g – 30%** | **9.3g – 14%** |
| **Fat** | **10.4g – 87%** | **21.3g – 61%** | **21.4g – 72%** |
| **Protein** | **1.4g – 6%** | **6.7% – 9%** | **9.1g – 14%** |

**Consumer trends for target food markets**

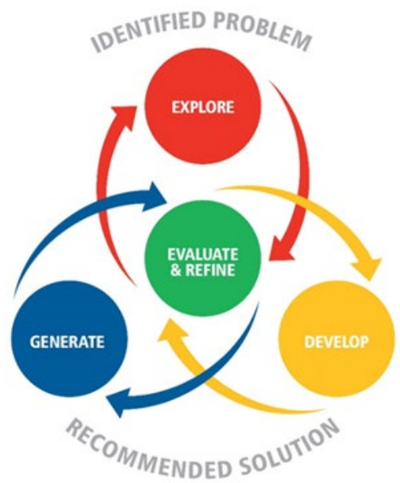
1. **Convenience** — Due to busy lifestyles consumers are looking for foods which taste great but are easy to prepare or can be used straight away with little fuss.
2. **Perceived quality** — Many consumers want companies to use less artificial additives and consider less processing of foods, with ingredient lists that are written in plain language.
3. **Mindful choices** — Consumers want to know more about what is in their food and where it was produced. They are worried about ethical effects on the environment and animals, and the healthiness of food.
4. **Lower cost —** Consumers don't want to pay exorbitant costs for food products but they still want great flavour and good quality.

**Recommended fat allowance per day**

This table is based on 30% of the kilojoules being eaten as fat each day.

| Gender | Kilojoule intake | Fat intake |
|---|---|---|
| Women | | |
| Moderately-active | 8,400 | 60 g |
| Sedentary | 6,300 | 45 g |
| Men | | |
| Moderately-active | 10,500 | 80 g |
| Sedentary | 8,400 | 60 g |

**Problem-solving process in Food & Nutrition**



# Instrument-specific marking guide (IA1): Examination (20%)

## Criterion: Recognising and explaining

### Assessment objectives

1. recognise and describe facts and principles related to the processing and nutritional, chemical, functional and sensory properties of carbohydrate- or fat-based food
2. explain food science ideas and problems related to carbohydrate- or fat-based food

| The student work has the following characteristics: | Marks |
|---|---|
| • accurate and discriminating recognition and discerning description of facts and principles related to the processing and nutritional, chemical, functional and sensory properties of carbohydrate- or fat-based food<br>• discerning explanation of food science ideas and problems related to carbohydrate- or fat-based food. | 4–5 |
| • appropriate recognition and description of some facts and principles related to the processing or nutritional, chemical, functional or sensory properties of carbohydrate- or fat-based food<br>• appropriate explanation of food science ideas and problems related to carbohydrate- or fat-based food. | 2–3 |
| • variable recognition and superficial description of the processing or nutritional, chemical, functional or sensory properties of carbohydrate- or fat-based food<br>• superficial explanation of food science ideas and a problem related to a carbohydrate- or fat-based food. | 1 |
| • does not satisfy any of the descriptors above. | 0 |

## Criterion: Analysing and determining

### Assessment objectives

3. analyse problems, information and data related to the properties and processing of carbohydrate- or fat-based food
4. determine solution requirements and criteria for carbohydrate- or fat-based food problems

| The student work has the following characteristics: | Marks |
|---|---|
| • insightful analysis of relevant problems, information and data related to the properties and processing of carbohydrate- or fat-based food to identify essential characteristics and constraints<br>• astute determination of<br>– essential solution requirements from the brief<br>– self-determined criteria that include the relevant impacts and implications, and the quality, functionality and reliability indicators for carbohydrate- or fat-based food problems. | 5–6 |
| • appropriate analysis of problems, information and data related to the properties and processing of carbohydrate- or fat-based food to identify some of the characteristics and constraints<br>• reasonable determination of some<br>– solution requirements from the brief<br>– self-determined criteria that include impacts and implications, and the quality, functionality or reliability indicators for carbohydrate- or fat-based food problems | 3–4 |
| • makes statements about a problem or information related to a carbohydrate- or fat-based food problem<br>• vague identification of some solution requirements for carbohydrate- or fat-based food problems. | 1–2 |
| • does not satisfy any of the descriptors above. | 0 |

## Criterion: Synthesising and evaluating

### Assessment objectives

5. synthesise chemical, functional and nutritional information and data for carbohydrate- or fat-based food solutions

7. evaluate and refine ideas and carbohydrate- or fat-based food solutions to make justified recommendations for enhancement

| The student work has the following characteristics: | Marks |
|---|---|
| • coherent and logical synthesis of chemical, functional and nutritional information, and primary and secondary data for chosen solutions<br>• critical evaluation and discerning refinement of ideas and carbohydrate- or fat-based food solutions against self-determined criteria to make astute recommendations for enhancements, justified by data. | 8–9 |
| • logical synthesis of chemical, functional and nutritional information, and primary and secondary data for chosen solutions<br>• reasoned evaluation and effective refinement of ideas and carbohydrate- or fat-based food against self-determined criteria to make effective recommendations for enhancements, justified by data. | 6–7 |
| • simple synthesis of chemical, functional or nutritional information, and primary or secondary data for chosen solutions<br>• feasible evaluation and adequate refinement of ideas and carbohydrate- or fat-based food solutions against some self-determined criteria to make fundamental recommendations for enhancements, justified by data. | 4–5 |
| • rudimentary synthesis of information and data for a chosen solution<br>• superficial evaluation and refinement of ideas and a carbohydrate- or fat-based food solution against some criteria to make elementary recommendations for enhancements. | 2-3 |
| • unclear combination of information about a solution for a carbohydrate- or fat-based food problem<br>• identification of a change to an idea or solution. | 1 |
| • does not satisfy any of the descriptors above. | 0 |

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