



## General Certificate of Secondary Education

# Design and Technology: Food Technology 3542

*Full Course Higher Tier*

## Mark Scheme

*2005 examination - June series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

1

(a)

(i) **Name one method of research used to find out about consumer views on different types of milk.**

Any one of the following:

- Questionnaire
- Surveys / on line surveys
- E-mail
- Interviews
- Consumer taste panels
- Media / TV / digital

Answer must be relevant to requesting feedback from consumers not manufacturers.

*(1 mark)*

(ii) **Describe how this research is carried out.**

Description may include:

- Place where research is carried out
- Type of people to ask / target group / audience
- Number of people asked
- Examples of questions asked / number / type
- How results are recorded
- Analysis of results/data
- Conclusions drawn from results
- Evaluation of research and method
- How answers may benefit design of new products

Detailed answer giving accurate information on how carried out.

4 marks

Mixture of simplistic and detailed points. Correct research method identified.

2-3 marks

Simplistic answer. May have incorrect method.

1 mark

*(4 marks)*

(b) **The chart below shows the results of research into milk sales.**

(i) **Name one type of milk that has become more popular.**

Answer must identify one of the following:

Either: skimmed or soya

*(1 mark)*

**(ii) Give reasons for this change.**

Skimmed milk	Soya milk
Possible reasons:	Possible reasons
<ul style="list-style-type: none"> <li>• Healthy option / Awareness of dietary needs</li> <li>• lower in energy – kcals</li> <li>• Lower in fat / cholesterol</li> <li>• Cream removed</li> <li>• Consumer preferences e.g. taste</li> <li>• More available on sale</li> <li>• More recipes requiring skimmed milk</li> <li>• Nutritional reasons, e.g. higher in calcium</li> <li>• May be recommended for medical reasons</li> <li>• Greater awareness</li> <li>• More advertising</li> </ul>	<ul style="list-style-type: none"> <li>• Healthy option / Awareness of dietary needs</li> <li>• Lower in energy</li> <li>• Lower in fat</li> <li>• Suitable for vegetarians</li> <li>• Suitable for consumers with milk allergies</li> <li>• May be recommended for medical reasons</li> <li>• Consumer preferences e.g. taste</li> <li>• More available on sale</li> <li>• More recipes requiring soya milk</li> <li>• Environmental reasons / religious / cultural</li> <li>• Greater awareness</li> <li>• More advertising</li> </ul>

Detailed answer giving accurate choice and reasons.	3 marks
Mixture of simplistic and detailed points. Correct milk identified.	2 marks
Simplistic answer. May have incorrect method.	1 mark
	<b>(3 marks)</b>

**(iii) What does UHT stand for?**

UHT = ultra heat treated / ultra heat treatment

**(1 mark)**

**(iv) What are the advantages of UHT milk?**

Advantages:

- Heated above 132°C for 1 second / all micro organisms are destroyed
- Keeps fresh up to 6 months / longer shelf life - unopened
- Keeps without refrigeration- if unopened
- Little change in colour, taste or nutritional value
- Available in a range of portion sizes

Qualified answers or simplistic answers.	2- 3 marks
Simplistic answer.	1 mark
	<b>(3 marks)</b>

(v) **Name two types of milk that will be in the category ‘other’ on the chart.**

Any two of following:

Channel Islands

Semi skimmed

Homogenised

Sterilised

Evaporated

Condensed

Dried

Baby formula

Goats

Whole milk

Enriched milk

Rice

Coconut

Lactose free

Organic

NOT ‘breakfast’ milk

May refer to colour of top e.g. accept gold, red, green top (not blue)

**(2 marks)**

2 (a) **Describe different control checks that take place during two other stages of yoghurt production**

Control checks must relate to correct stage of production.

Accurate matching of stage to control check.

Any 2 stages from stage 2, 3, 4 or 5.

**2 marks**

Stages of production	Control checks
1. Lactic and bacteria added to milk.	N/A as example given.
2. Heated to 37° - 44°C	Temperature Control Microbiological tests.
3. Flavouring and colouring added.	Quality / shelf life of ingredients. Quantity / weight checks / accurate measurement. Strength of colour / visual checks. Strength of flavour / taste tests.
4. Cooled and stored below 5°C.	Temperature Control. Microbiological checks. Time controls – speed of cooling.
5. Final product sold to consumers.	Condition of packaging. Accuracy of labelling. Weighing. Seal Metal detector. Taste testing.

*NB: Marks only awarded if correct matching of check to stage is carried out.*

Qualified answer or two simplistic answers.

2 marks

Simplistic answer.

1 mark

2 x 2 marks

**(4 marks)**

**(b) Why are control checks used?**

Control checks are used for:

- Quality
- Consistency
- Monitoring
- Prevent problems
- Keep food safe to eat
- Setting standards / monitoring of QA system

Qualified answers or two simplistic answers.

2 marks

Simplistic answer.

1 mark

**(2 marks)**

3

**A catering company makes lunches for secondary school children. The test kitchen is developing new ideas for cold desserts.**

**A successful cold dessert product will:**

- **include milk products**
- **be easy to serve as single portions**
- **appeal to different cultural tastes**
- **be served chilled.**

**(a) With the aid of notes and sketches, produce two different design ideas, which meet the design criteria. DO NOT draw any packaging.**

Each sketch should reflect the design criteria.

- Ideas produced must be different products not variations of the same product.
- Ideas should be communicated through the use of notes and sketches, including 2D, 3D or cross sections.
- Notes may show main features of the product, dimensions, flavour, shape, texture, colour, ingredients, finishing techniques, cooking / preparation methods, portion control.

Recognisable sketch / prose shows good communication of the main features of a relevant product.

4-5 marks

Sketch / prose shows basic ideas for a relevant product but not clearly communicated.

2-3 marks

Sketch / prose attempted but inappropriate choice of product.

1 mark

2 x 5 marks. **(10 marks)**

**(b) Choose one of your design ideas for the manufacturer to develop.**

**Explain in detail how your choice of ingredients helps to meet the needs of the school children**

**(i) by your choice of milk products;**

No marks awarded for choice of idea. Explanation of how product meets the design criteria.

Choice of milk product: Identify type of milk product used, portion control, multi cultural appeal, suitability for school lunches, nutritional value, e.g. protein for growth, calcium for teeth / bones, Vitamin A for growth, fat for energy.

Number of simplistic answers or one / two detailed answers showing clear understanding.

2-3 marks

Simplistic answers showing some understanding.

1 mark  
**(3 marks)**

**(ii) by using ingredients that will appeal to different cultural tastes.**

Multi cultural ingredients e.g. Greek yoghurts, kulfi, nuts, flavours, exotic fruits, spices.

Link to country of origin, suitability for sensory appeal, taste, variety in colour / flavour / texture to add interest. Any relevant point.

Number of simplistic answers or one / two detailed answers showing clear understanding.

2-3 marks

Simplistic answers showing some understanding.

1 mark  
**(3 marks)**

**(c) Write a five point product specification for your chosen idea.**

Any five different specification points given. These may relate to:

- Portion size
- Nutritional value
- Dimensions – designated tolerances
- Specific ingredients, origin / supplies of ingredients
- Weight of ingredients
- Preparation methods
- Cooking / Production methods
- Finishing techniques
- Serving details
- Storage time
- Target group
- Costs.

Maximum of 2 marks if straight repeat of given criteria (5 x 1 mark)

**(5 marks)**

**(d) Produce a plan for making your chosen idea in the test kitchen.**

**You may use flow charts, diagrams, notes or sketches in your answer.**

Plan for making in test kitchen :

Look for candidate showing awareness of different aspects to consider when planning the making of a food product.

At least one reference to any of following:

- Logical sequence
- Dovetailing of tasks
- Specialist terminology
- timings
- Temperatures
- Named processes
- Personal hygiene
- Kitchen hygiene
- Safety / risk assessment
- Control checks / HACCP
- QA / QC – size, shape, portion
- Feedback on any checks
- Clarity of instructions
- Recipe.

Answer showing logical plans, clarity of instruction and detail.	9-10 marks
Logical planning with a range of different information covered.	6-8 marks
Some parts detailed, may not be logical some key areas for successful making omitted.	4-5 marks
Simplistic answer giving some relevant planning.	1-3 marks
	<b>(10 marks)</b>

**(e) Explain how food workers will be prepared and trained for work in the test kitchen.**

For full marks candidates should cover both preparation and training of food workers

Preparation

- Clean clothing / apron
- Sanitise
- Clean hands
- Short clean nails
- Disposable gloves
- Hair nets / hair tied back
- No nail polish
- No strong perfume
- Clean footwear
- Blue plasters on cuts – NOT WATERPROOF
- No jewellery
- Training in food hygiene
- Kitchen rules e.g. reporting illnesses
- Personal cleanliness / habits.

Training:

- Use of correct equipment e.g. correct colour chopping boards
- Personal safety e.g. health and safety at work
- Personal skills e.g. knife skills
- Food hygiene training e.g. basic food hygiene certification
- Kitchen rules e.g. reporting illnesses
- Follow HACCP systems
- May have a food / catering based qualification
- Good knowledge and understanding of procedures for cooking / preparing and storage of food.

Range of detailed answers covering both preparation and training.

6 marks

Mixture of simplistic and detailed answers – may only cover only preparation and training. \*max 5 if one aspect missing

3-5 marks

Simplistic answers.

1-2 marks  
**(6 marks)**



**4 (a) A food manufacturer is developing a range of cheesecake products.**

**Explain how a basic cheesecake can be developed to meet the needs of consumers.**

Development	Reason
Addition of named ingredients:	Refer to
<ul style="list-style-type: none"> <li>• nuts</li> <li>• coconut</li> <li>• chopped / pureed / sliced fruit</li> <li>• chocolate chips</li> <li>• toffee chunks</li> <li>• glace cherries</li> <li>• cereals</li> <li>• artificial flavours / colours.</li> </ul>	<ul style="list-style-type: none"> <li>• appearance,</li> <li>• taste</li> <li>• aroma</li> <li>• colour</li> <li>• texture.</li> </ul>
Decoration e.g. <ul style="list-style-type: none"> <li>• piping</li> <li>• drizzling,</li> <li>• marbling,</li> <li>• cream / chocolate.</li> </ul>	May name specific details.
Any relevant development idea e.g. <ul style="list-style-type: none"> <li>• chocolate leaves</li> <li>• flakes etc.</li> </ul>	
Use of ingredients to reduce fat / sugar content: <ul style="list-style-type: none"> <li>• sweeteners</li> <li>• sugar “light” products</li> <li>• lower fat dairy products</li> <li>• low fat base,</li> <li>• biscuit</li> <li>• half yoghurt / crème fraiche.</li> </ul>	Ideas to <ul style="list-style-type: none"> <li>• reduce fat content</li> <li>• reduce sugar content.</li> <li>• Fresh rather than artificial colours / flavours.</li> <li>• Increase fibre</li> </ul>
Increase fibre content: <ul style="list-style-type: none"> <li>• use of wholemeal biscuits for base</li> <li>• adding nuts</li> <li>• oats</li> <li>• bran</li> <li>• fresh fruit.</li> <li>• Leaving skin on fruits e.g. apples.</li> </ul>	NOT ‘HEALTHY’

Range of detailed answers covering both development ideas and reasons.	6-8 marks
Mixture of simplistic and detailed answers - may cover only development ideas or reasons.	3-5 marks
Simplistic answers.	1-2 marks <b>(8 marks)</b>

- (b) Using notes and sketches describe how a quality finish can be achieved by decorating the top of a cheesecake.**

**Your design idea should use a mixture of fruit, chocolate and cream.**

- Identify use of chocolate
- Identify use of fruit
- Identify use of cream
- Quality finish shown on sketch

Other Quality procedures noted, i.e. method of production, dimensions.

Recognisable sketch / prose shows good communication of finishing techniques used. 4-5 marks

Sketch / prose shows basic ideas for a finish but not clearly communicated. 2-3 marks

Sketch / prose attempted but inappropriate choice of finish. 1 mark  
**(5 marks)**

- 5 (a) Explain why food manufacturers use the following.**

Single qualified answer or two simplistic answers. 2 marks

Simplistic unqualified answer. 1 mark

- (i) 1 egg to 125ml of milk in an egg custard**

Egg custard

- Proportions needed to enable mixture to 'set'
- Set/ coagulation of egg
- When heated

**(2 marks)**

- (ii) Butter in shortcrust pastry**

Butter in pastry

- To add colour
- To add taste/ flavour
- To add nutritional value
- To extend shelf life
- To improve shortness / texture / richness
- NOT BINDING

**(2 marks)**

- (iii) Modified starch in chocolate mousse**

Modified starch in chocolate mousse

- Thickening agent / pre gelatinised
- Sets without heat / may refer to 'smart' materials
- Improves texture / creaminess / smoothness / consistency
- Prevents syneresis
- Stability of mixture
- Speed up production
- No starchy taste

**(2 marks)**

**(iv) Soya milk in milkshakes**

Soya milk

- Allergy sufferers, e.g. lactose intolerance
- Vegetarian alternative
- Lower in saturated fats / kcals / healthier
- Suitable for people with beliefs about not eating animal fats
- Not 'healthier option'

**(2 marks)**

**(b) Standard components are often used in the production of desserts.**

**(i) What is meant by a standard component?**

Standard components:

- Ready prepared components
- Often brought in from a supplier
- Made elsewhere
- To simplify production
- Reduce stages of production
- Made to a specific requirement
- Guarantee a standard product / consistency
- May give examples to illustrate answer

Single qualified answer or two simplistic answers.

2 marks

Simplistic unqualified answer.

1 mark

**(2 marks)**

**(ii) Give three reasons why manufacturers may decide not to use standard components.**

Three reasons **not** to use standard components:

- Expensive
- Need storage space
- May be inferior / poor sensory qualities
- May contain additives / preservatives
- No control over making
- May not fit specification
- Supplies may be interrupted
- Cannot always guarantee a 100% safe product
- Exclusivity
- May have facilities to make own components

3x1 mark

**(3 marks)**

**6 The ingredients and method listed below are used to make Kulfi, a popular multi cultural ice cream.**

**(a) Why is it important for the packaging to show a list of ingredients?**

Ingredients:

- Allow choices to be made
- Not familiar with dishes popular in other cultures
- Customer preferences / likes / dislikes
- Possible allergies e.g. milk
- Warning of dangers of nuts / allergy warnings
- Prepared / not seen made
- Required by law
- Informs consumer

Single qualified answer or two simplistic answers.

2 marks

Simplistic unqualified answer.

1 mark

**(2 marks)**

**(b)**

**(i) Name one ingredient used to thicken the kulfi mixture.**

Ingredients used to thicken;

- Ground rice
- Ground almonds
- Double cream
- Evaporated milk

Any one for 1 mark.

**(1 mark)**

**(ii) Name one ingredient used to add a multi cultural flavour.**

Ingredients used to add multi cultural flavour:

- Pistachio nuts
- Ground almonds
- Vanilla
- Cardamom
- Ground rice

Any one for 1 mark.

**(1 mark)**

**(c) Explain why the instructions advise stirring continuously**

**(i)**

Stirring continuously:

- Prevents lumps / separation of ingredients
- Blend ingredients together / Allows thorough mixing of ingredients / flavour
- Keeps smooth texture
- Glossy texture
- Prevents burning
- 

Qualified answers or mixed with simplistic answers.

2-3 marks

Simplistic unqualified answer.

1 mark

**(3 marks)**

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**(ii) cooling completely before freezing**

Cooling completely:

- Sets quicker
- Prevents build up of temperature in freezer
- Causes build up of ice
- Effective temperature control
- Some ingredients affected by high temperatures
- Slows down bacterial growth
- 

Single qualified answer or two simplistic answers.

2 marks

Simplistic unqualified answer.

1 mark

**(2 marks)**

**(iii) placing in a refrigerator 1 hour before use.**

Placing in refrigerator:

- Softens a little
- Easier to serve / portion

Single qualified answer or two simplistic answers.

2 marks

Simplistic unqualified answer.

1 mark

**(2 marks)**

**(d) Manufacturers collect and use data during the manufacture of ice cream.**

**(i) Identify two stages where data logging of temperatures will occur during the production of ice cream.**

May refer to any two of the following stages:

- Stage 1 Warming
- Stage 2 Boiling
- Stage 5 Cooling
- Stage 6 Freezing
- Stage 7 Refrigerating (Thawing)

Single qualified answer or two simplistic answers.

2 marks

Simplistic unqualified answer.

1 mark

**(2 marks)**

**(ii) Why is it important to keep a data log of temperatures?**

Any two answers

- Accuracy
- Consistency
- Food safety
- Quality control
- Critical controls
- Legal requirements
- Reduces wastage

Single qualified answer or two simplistic answers.

2 marks

Simplistic unqualified answer.

1 mark

**(2 marks)**

**(e) What are the advantages of using an electric ice cream maker when testing and developing new ice cream products?**

Advantages - electric ice cream maker.

- Good for smaller test portions
- Can be pre-programmed in advance
- Less human error
- Temperature controlled
- Saves energy / time
- Allows workers to do another job while waiting
- Computer control provides consistent product
- Allows for fair testing

Qualified answer or mixed with simplistic answers.

Simplistic unqualified answer.

2-3marks

1 mark

**(3 marks)**

**7 (a) Manufacturers must make risk assessments on any hazards present during production.**

**(i) Give examples of hazards in the making of a lemon mousse.**

**(ii) Describe one way each hazard may be controlled.**

(i) Hazard

**Microbiological:**

Bacterial contamination from staff, work area, equipment, food, poor quality control/ storage or cooking processes.

**Physical:**

Pieces of packaging, metal from equipment, jewellery from workers, hair, nails, glass from containers, pests, insects, plasters.

**Chemical:**

Cleaning materials, bleaches, sanitisers not removed thoroughly.

(ii) Control

Bacterial counts, routine / regular checks, correct preparation and training of staff, temperature control of storing batter, raw ingredients. Temperature / time control of any cooking processes.

Metal detectors, visual checks.

Chemical checks, pH tests, thorough cleaning, regular inspection.

3 x 1 mark

3 x 1 mark

**(6 marks)**

**(b) Incorrect storage and use of milk based products may result in food poisoning.**

**Why do milk based products carry a high risk of food poisoning?**

High risk:

- Milk is moist
- High protein food
- Bacterial count increases if not stored correctly
- Raw milk ideal breeding ground for bacteria
- Pasteurised milk has only been treated to 71°C for 15 seconds – not all bacteria may be destroyed.

Single qualified answer or two simplistic answers.

Simplistic unqualified answer.

2– 3 marks

1 mark

**(3 marks)**

**(c) Use the chart below to name and describe the symptoms of two food poisoning bacteria that can be found in milk products.**

Food poisoning bacteria.

Any two of following:

Bacteria	Salmonella	Listeria	E coli	Campylobacter
Symptoms	- High fever - Diarrhoea - Vomiting / sickness - Abdominal pains	Mild flu like symptoms - shivering - sweating - temperature change - sore throat - aching limbs	- Diarrhoea - Abdominal pains - Vomiting / sickness	- Diarrhoea - Headache - Fever / temperature - Abdominal pains
May lead to	Can be fatal	- Septicemia - Pneumonia - Miscarriage - Premature labour - Infected baby	- Kidney failure in serious cases	Gastroenteritis

2 x 1 mark for naming type of food poisoning bacteria.

2 x 2 marks for describing different symptoms / effects may be credited.

**(6 marks)**

**(d) Explain how the correct choice of packaging and use of labelling can help prevent food poisoning.**

Packaging and labelling preventing food poisoning:

for full marks answer must cover both packaging and labelling:

Packaging:

- protects product from damage / contamination from outside
- choice of materials suit cooking / storage temps to keep product safe to eat
- impermeable materials prevent absorption / airtight to prevent dangerous bacteria entering and multiplying
- modified atmospheric packaging contains gases which slow down bacteria growth in food and reduces risk of food poisoning.

Labelling:

- list of ingredients indicates what is contained in product identify any high risk foods
- storage conditions indicate correct temp and conditions to keep product safe to eat
- shelf life indicates when no longer safe to eat
- instructions for use give optimum temps / times for safe cooking
- special claims / info warn of any dangers / if suitable for freezing / if pre-frozen
- batch numbers given to identify production details.

Range of detailed answers covering both packaging and labelling.

6 marks

Mixture of simplistic and detailed answers- may cover only packaging or labelling. \* max 5 if one aspect missing

3-5 marks

Simplistic answers.

1-2 marks

**(6 marks)**