



## General Certificate of Education

# Design and Technology: Food Technology 5541

*FTY1*

## Mark Scheme

*2006 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) **Explain which type of milk would be a suitable ingredient when producing a range of food products for**

- young children
- adults.

**1 mark to identify, 1 mark for food products, 2 nutrients**

Whole milk – high biological protein, lactose, fat soluble vitamins A and D, calcium, phosphorus

Semi / skimmed milk – higher percent of calcium, low fat content, HBV Protein

Soya maybe mentioned for lactose intolerance – health awareness

*(2 x 4 marks)*

(b) **Explain the differences in the composition of 100g of the food products listed in the table below.**

**Data only 5 marks maximum**

Responses will mention 1 example only or superficially mention all of the food products, with little / no explanation of the differences in the composition.

1 - 3

5 marks = data only

Responses will refer to most of the data listed and attempt to explain it accurately. Some of the differences in the composition of the food products will be listed.

4 – 7

Responses should make clear reference to all of the data, explaining the information given accurately. The correct use of the units of measurement and the differences between each should be explained for each nutrient stated.

8 – 10

*(10 marks)*

(c) **Explain each of the following:**

- denaturation
- coagulation.

**Use examples of food products in your answer.**

Denaturation – change to properties of protein to produce food products. Irreversible reaction.

Coagulation – to change from a liquid to a solid, or semi-solid, state. Plus examples of food products. Correct temperatures quoted. Correct example = 1 mark

*(2 x 3 marks)*

- (d) **Describe two food products that a food manufacturer could produce which are rich in both Vitamin D and Calcium. Make reference to specific ingredients in your answer.**

Any appropriate sources will be accepted.

Vitamin D – e.g. milk, dairy produce, oily fish

Calcium – e.g. dairy produce, milk, chocolate

Food product – 1 mark

Vitamin D – 1 mark

Calcium – 1 mark

*(2 x 3 marks)*

- (e) **With reference to specific examples, explain why a food manufacturer would use food additives to enhance the sensory characteristics of a product range.**

Examples include:

To make food visually attractive to the consumer. Colours are added to meat products such as sausages to give them a red colour rather than the natural brown colour, because consumers associate the red colour with freshness.

To replace colour that is lost during processing. During processing strawberries and peas turn brown and blackcurrant cordial turns grey; therefore artificial colours make them look more attractive. Additives make sure that different batches are consistently coloured and boost natural colouring (strawberry yoghurt).

To colour products that are normally colourless, e.g. ice cream, confectionary.

To produce novelty foods, e.g. coloured sugar crystals.

Emulsifiers and stabilisers ensure that food products remain in a stable condition, e.g. jam. Flavours to ensure continuity, many extracted from oils, e.g. peppermint. Flavour enhancers, e.g. monosodium glutamate, to bring out the flavour, e.g. cheese.

Foaming agents to ensure bubbles are evenly distributed, e.g. ice cream; glazing agents to give a shiny outer layer, e.g. sweets; humectants to stop foods drying out, e.g. soft centres in chocolates; modified starch to add bulk, e.g. baby foods; gelling agents to enhance texture; propellants to make texture of aerosol cream; thickeners (e.g. in yoghurts) to improve texture.

*(10 marks)*

**2 From a recipe for Shortcrust Pastry**

- **100g Plain Flour**
- **25g Butter/Margarine**
- **25g White Cooking Fat/Lard**
- **Cold Water to mix and a pinch of salt**

**(a) Explain the functions of each ingredient in the recipe above.**

Plain Flour – structure, crumb, texture  
Butter/margarine – flavour, colour, texture  
White Cooking Fat/Lard – Texture, flavour  
Salt – flavour, gluten - structure  
Water – to bind ingredients

*(4 x 2 marks)*

**(b) Explain how a food manufacturer could modify the above ingredients for shortcrust pastry, in response to consumer demands for healthier products.**

Wholemeal flour, low-fat margarine, low-fat white cooking fat, milk if justified nutritionally, removal of salt.

*(8 marks)*

**(c) Explain each of the following processes in the production of shortcrust pastry**

- **gelatinisation**
- **aeration.**

Gelatinisation – upon heating, starch thickens and forms the structure of the pastry.  
Aeration – incorporating air into the pastry when rubbing fat into flour, rolling out, sieving.

*(2 x 2marks)*

- (d) **Discuss why a food manufacturer would use standard pre-manufactured components in a product range based on shortcrust pastry.**

Responses will reflect sound and accurate knowledge of why a food manufacturer would use standard food components in a product range. Examples include:

To save production time due to fewer manufacturing processes.

To reduce the amount of equipment needed, reduce production costs, less energy, fewer staff.

To save time purchasing and preparing raw materials.

To ensure consistency in terms of size, weight, shape, flavour and preparation.

To make stock control easier and extend range of products available.

*(8 marks)*

- 3 (a) **Describe the effect of moist heat on starch.**

Starch grains absorb liquid, swells, thickens liquid, bursts. Approximately 60°C. Gelatinisation.

*(3 marks)*

- (b) **Explain why rice would be a suitable ingredient when producing a snack food product range. Make reference to sensory characteristics, types of rice and food processing in your answer.**

Sweet or savoury products, versatile, cheap, absorbs flavour, easy to store. Addition of ingredients – fruit or vegetables enhances colour, texture, flavour, smell. Addition of herbs / spices. Hot or cold products, sweet / savoury products. Readily available. Nutritional value i.e. high carbohydrate. Adds bulk.

Sensory characteristics. Food processing. Different types of rice.

*(12 marks)*

- (c) **Explain why rice is a high risk food.**

Ideal food in which harmful bacteria grow. Rice often reheated. Cool rapidly once cooked. Short shelf life once cooked.

Heat = 1 mark

Bacillus Cereus = 1 mark

Harmful Bacteria = 1 mark

plus another

*(4 marks)*

**(d) Explain the importance of the following in the production of food products**

- **emulsification**
- **dextrinisation**
- **moisture retention.**

**Make reference to specific food products in your answer.**

Emulsification – fats and oils mix with water to form a solid state.  
Dextrinisation – when products like bread or cakes are cooked using a dry heat such as in baking, the starch changes to dextrinisation the surface of the product and then caramelises, producing characteristic flavours and aromas.

Moisture Retention – to prevent the products from drying out, becoming stale.

Example of a food product for each one = 1 mark

*(3 x 3 marks)*

**4 (a) (i) Name two sources of Iron.**

Iron – offal, green vegetables, dark chocolate, curry powder, red meat.

*(2 marks)*

**(ii) Name two sources of Vitamin C.**

Vitamin C – citrus fruit, green vegetables, milk

*(2 marks)*

**(b) Explain how mass production methods can affect the nutrient content of specific food products.**

5 nutrient groups maybe mentioned.

Minerals and Fat soluble vitamins remain relatively unchanged. Effects of heat, dehydration, water, acid, alkali, oxidation referred to accurately.

Specific examples of food products must be given.

*(10 marks)*

**(c) Explain why it is beneficial to fortify soya with micro nutrients.**

Response may focus upon the benefits of fortification to either the consumer or the food manufacturer. High HBV protein, fortified with iron, B vitamins, to bring up to nutritive value. Wider target audience, versatility, cost effective, social, moral and environmental issues may be addressed.

*(4 marks)*

- (d) Discuss, with specific examples, why soya would be a suitable ingredient when producing ready meals.**

Soya would be a suitable ingredient for a range of ready meals:

- Suitable for vegetarians
- Cheap
- Easy to store, prepare and cook, little waste, different shapes and forms
- Source of HBV Protein, easy to fortify
- Environmental issues.
- Absorbs flavours well
- Meat extender

Responses must be well justified.

**(10 marks)**