



**B O A R D O F S T U D I E S**  
NEW SOUTH WALES

## **2011 Food Technology HSC Examination 'Sample Answers'**

When examination committees develop questions for the examination, they may write 'sample answers' or, in the case of some questions, 'answers could include'. The committees do this to ensure that the questions will effectively assess students' knowledge and skills.

This material is also provided to the Supervisor of Marking, to give some guidance about the nature and scope of the responses the committee expected students would produce. How sample answers are used at marking centres varies. Sample answers may be used extensively and even modified at the marking centre OR they may be considered only briefly at the beginning of marking. In a few cases, the sample answers may not be used at all at marking.

The Board publishes this information to assist in understanding how the marking guidelines were implemented.

The 'sample answers' or similar advice contained in this document are not intended to be exemplary or even complete answers or responses. As they are part of the examination committee's 'working document', they may contain typographical errors, omissions, or only some of the possible correct answers.

## Section II

### Question 21

*Sample answers:*

Ecologically sustainable food production refers to ecological/environmental systems that can maintain food production for the future. Our systems of agriculture and fisheries need to be preserved not only now but also for future generations, for example organic farming, renewable energy or recycling systems.

### Question 21 (b)

*Sample answers:*

Genetically modified (GM) foods are foods that have had their original properties changed using a process called gene technology. GM foods have the potential to be resistant to insects and/or chemicals and to increase yields. This means that such crops are ecologically sustainable, can produce higher yields and can therefore feed more mouths.

The efficient use of gene technology can result in breeding better plants. This process of selective breeding means more disease resistant plants now and in the future.

There are also concerns about the use of GM crops, such as an increasing reliance on monocultures, ethical issues and excessive economic control. Other issues to consider include the need to continually purchase seed (which is sterile), allergies, personal choice, implications for labelling and consumer concerns in general.

### Question 22 (a)

*Answers could include:*

Conditioning, grinding, sifting or cleaning.

### Question 22 (b)

*Sample answer:*

Conditioning of wheat grain is the addition of water to give grain a standardised moisture content.

**Question 23*****Answers could include:***

Government policies and the food industry:

- national health and nutrition policies
- trade policy.

Sectors of the Australian food industry:

- agriculture and fisheries
- food manufacturing and processing
- food service and cooking
- food retail.

Legislation and the food industry-

- *Trade Practices Act 1974*
- *Food Act 2003 (NSW)*
- *Occupational Health and Safety Act 2001 (NSW)*
- *Fair Trading Act 1997 (NSW)*
- *Imported Food Control Act 1992*
- *Fisheries Management Act 1991.*

**Question 24 (a)*****Sample answer:***

- (i) Emulsifiers: used to allow oil and water to be combined in a product while ensuring that they do not separate in storage.  
*Example:* lecithin stabilises oil and vinegar in mayonnaise.
- (ii) Humectants: absorb moisture and prevent foods, such as fruitcake, from drying out.  
*Examples:* sorbitol and glycerine.

**Question 24 (b)*****Sample answer:***

The listing of long names on food labels requires excessive space. The code-numbering system for food additives is an advantage as it saves space. Consumers with food allergies can easily memorise codes. Codes allow consumers to access more detailed information through books or online.

**Question 25 (a)*****Sample answer:***

Producing a prototype ensures that any faults with the product are identified before full-scale production begins. The prototype can be used to test consumer acceptance, compatibility with factory machinery and suitability for sale. Feedback can be acted on and faults minimised before production, thus saving a large amount of resources.

**Question 25 (b)****Answers could include:**

- storage trials – testing various methods of storage/distribution to determine shelf life
- test against legislative requirements
- target-market testing, including sensory tests, packaging, labelling design and consumer acceptance.

**Question 26 (a)****Answers could include:**

<i>External factors</i>	<i>Example</i>
political environment	trade restrictions
ecological environment	biodegradable packaging
technological environment	MAP
economic environment	exchange rates

**Question 26 (b)****Sample answer:**

When the economy takes a downturn consumers generally become more price sensitive and look for food products that seem to represent value. The food industry responds to this with deals such as 'two for the price of one' and discount pricing. Loss-leader strategies may also be used at this time. This involves sacrificing profits on products, such as milk, to bring more people into the shops and thereby increase overall sales.

When the economy improves, price skimming may be introduced. This is when a new product, often one that uses a new technology, enters the market. The producer generally sacrifices sales for high profit. The price may be dropped as the technology becomes more commonplace. Premium pricing may also be used at this time. This is when the price is kept artificially high to create a perception among consumers that the product represents quality and/or luxury.

**Question 27 (a)****Sample answer:**

ATSI: heart disease, obesity, diabetes, alcoholism

Diabetes (type 2) is much more common among ATSI at a younger age than Australians of European descent, increasing the chance of blindness, kidney disease and gangrene.

Healthy fresh foods are often difficult to obtain and expensive in remote Aboriginal communities.

**Question 27 (b)****Sample answer:**

ATSI:

- less alcohol and more complex carbohydrates to reduce incidence of alcohol-related diseases and digestive disorders
- increase fresh fruit and vegetables to increase fibre content in the diet, which reduces the likelihood of obesity.

**Question 27 (c)****Sample answer:**

ATSI: maintenance of health and hygiene programs in Indigenous areas and nutritional educational programs – with an Indigenous health officer – that encompass culture in relation to western lifestyle. This nutrition education could include food habits and bush foods associated with the local area that have many nutritional benefits, such as increased fibre and low fat.

**Section III****Question 28 (a)****Answers could include:**

Causes of deterioration:

- physical reactions, eg bruising of fruit
- microbial activity, eg formation of mould
- enzymatic changes, eg over ripening
- rodent activity, eg animal infestation
- environmental factors, eg fruit getting wet/high temperatures
- chemical reactions, eg rancidity in oils.

**Question 28 (b)****Answers could include:**

Labelling requirements:

- |  |   |
|--|---|
| • name/description of food                                 | • nutrition information panel                           |
| • name/address of manufacturer and production/batch number | • date marking  |
| • country of origin  | • statement of quantity                                 |
| • ingredient list using percentage labelling               | • storage information (related to safety)               |
| • information on allergies                                 | • information must be in English, legible and truthful. |

Country of origin: guarantees to the consumer where the product was made, eg 'Product of Australia' – made in Australia using Australian ingredients.

Ingredients list: must be in descending order according to weight. Ingredient list must also declare additives by name or code number.

**Question 28 (c)****Answers could include:**

Preservation process (used on fruit), eg canning:

- explanation of process
- showing relationship between process and how it extends shelf life, eg by freezing, or drying.

Canning traditionally involves the cans being filled with the food product and a liquid. The air above the food is removed via steam or a vacuum chamber. The lid is placed on the can and sealed. Heating of the filled cans kills the microorganisms. The can is then cooled quickly.

Aseptic canning is another method of canning. Instead of the can and food being heated together, the food is heated to the correct temperature then placed in a sterile can.

Canning involves two preservation principles that extend shelf life (for fruit). The control of temperature, ie heating of the food inside the container creates a temperature that will destroy all microorganisms and therefore extend the life of the fruit.

The other principle is the exclusion of air by creating a vacuum inside the sealed container. This prevents microorganisms from reaching the food inside and minimises spoilage.

**Note:** Other process could include: dehydration, freezing, refrigeration, chilling/cooling or pasteurisation (for fruit juices).

**Section IV****Question 29****Answers could include:**

Societal changes provide opportunities for food manufacturers and food-product developers to produce new food products to meet their changing needs.

For example:

- ageing is becoming a bigger influence as the aged population increases (baby boomers) – their dietary needs include easily prepared nutritious foods in smaller serving sizes (many prepare food for themselves), eg portion serves, multi packs of cereals
- changes in lifestyle include eating away from home more regularly, eating on the run, eating organic foods, becoming vegan and spending longer hours in workplace
- changes to household structures include smaller households, more people living alone, sole parents with children, women working outside the home and higher density living (no backyard)
- health- and diet-related diseases include increases in the rates of obesity, diabetes, heart disease, coeliac disease and a range of allergies.

**Note:** Answers need to make a judgement regarding the response of food manufacturers and food-product developers in addressing these societal changes.