

2021 HSC Food Technology Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	D
2	C
3	B
4	A
5	B
6	C
7	A
8	C
9	B
10	C
11	B
12	A
13	D
14	A
15	C
16	B
17	D
18	A
19	D
20	C

Section II

Question 21 (a)

Criteria	Marks
• Sketches in general terms the roles of idea generation and screening	2
• Provides relevant information about food product development	1

Sample answer:

In the idea generation stage of planning a new product the company would construct a list of ideas for new products which may be suitable as me-too of an existing product. Ideas are then screened and eliminated if they are not suitable for the company to proceed with.

Answers could include:

- Conducting market research
- Researching materials and me-toos which could be made with existing equipment
- SWOT.

Question 21 (b)

Criteria	Marks
• Provides information on strength, weakness, opportunity and threat in relation to the given me-too	4
• Provides information on strength and/or weakness and/or opportunity and/or threat in relation to the given me-too	3
• Provides information on strength or weakness or opportunity or threat in relation to the given me-too	2
• Correctly names a strength/weakness/opportunity/threat in relation to the given me-too	1

Sample answer:

S – Already have a successful existing product and a strong company image.

W – May need to purchase new equipment and materials to package the product, as well as train staff.

O – Access to a new market of consumers wanting a generic version of an existing product.

T – Already exists on the market with competitors selling their version of the product.

Answers could include:

- Internal factors
- External factors.

Question 22 (a)

Criteria	Marks
• Sketches in general terms ONE emerging technology in the Australian food industry	2
• Provides relevant information on the Australian food industry	1

Sample answer:

Organic farming is when farmers do not use any pesticides on their crops and consumers can purchase chemical free food. These products are increasing in popularity as consumers consider their health when purchasing food.

Answers could include:

- Genetically modified foods
- Biotechnology
- Intelligent packaging
- Edible packaging.

Question 22 (b)

Criteria	Marks
• Provides characteristics and features of the benefits of ONE emerging technology in one sector of the Australian food industry	4
• Provides characteristics and/or features of a benefit of ONE emerging technology in one sector of the Australian food industry	3
• Sketches in general terms the benefit/s of ONE emerging technology in the Australian food industry	2
• Provides relevant information on the Australian food industry	1

Sample answer:

In the agriculture and fisheries sector of the AFI, genetically modified ingredients have had their genetic material altered. There are only a limited amount of GM foods grown in Australia. GM canola is one that is permitted to be grown. There are some benefits of growing and using GM ingredients eg they can be developed to be disease and pest resistant. Another benefit is that they have improved yields, which means they can produce more profits for the farmer.

Answers could include:

- Organic farming
- Emerging technologies in the areas of packaging and production.

Question 23 (a)

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms the features of equipment used by a household company in the production of a food product 	2
<ul style="list-style-type: none"> • Provides relevant information about equipment used in the production of a food product 	1

Sample answer:

Equipment used in a household food company will depend on the food item being produced. Domestic food appliances will usually be small and lightweight eg rolling pin, whisk, hand-held blender.

Answers could include:

- Manually operated
- Hygienic and safe.

Question 23 (b)

Criteria	Marks
<ul style="list-style-type: none"> • Provides characteristics and features of specifications food manufacturers need to consider when selecting raw materials 	3
<ul style="list-style-type: none"> • Sketches in general terms the specification/s food manufacturers need to consider when selecting raw materials 	2
<ul style="list-style-type: none"> • Provides relevant information about raw materials 	1

Sample answer:

Specifications for raw materials are important to ensure a quality manufactured product. Raw materials have to be selected based on their end use in a product and specifications may include: size, shape, consistency, availability and colour. Raw materials must be checked when arriving at the factory before they can be accepted and used on the production line.

Answers could include:

- Contamination by foreign or biological bodies
- Rejection of raw materials not meeting standards.

Question 23 (c)

Criteria	Marks
• Puts forward detailed information about waste management strategies a food manufacturing company could implement	4
• Provides characteristics and features of waste management strategies a food manufacturing company could implement	3
• Sketches in general terms waste management strategy/strategies a food manufacturing company could implement	2
• Provides relevant information about waste management	1

Sample answer:

A food manufacturing company could use raw materials such as flour for multiple products or leftover ingredients to create another product such as apples for apple pies, mini apple pies, apple sauce or apple juice. Alternatively, the company could use waste ingredients to create animal feed. Water used to clean the machinery and in the production of products could be recycled and treated to be used again or to irrigate the grounds of the production plant.

Answers could include:

- Recycling water for irrigation
- Recycling packaging material
- Selling unused produce for a lower price
- Donating unused produce.

Question 24 (a)

Criteria	Marks
• Sketches in general terms the main features of food deterioration for fruit and vegetables	3
• Sketches in general terms features of food deterioration for fruit or vegetables	2
• Provides relevant information about food deterioration	1

Sample answer:

Food naturally decomposes on its own through the action of enzymes. This is sped up by bruising and cutting the food. This can make food go bad more quickly. The other way that food can be affected is by microorganisms that make the food unsafe to eat.

Question 24 (b)

Criteria	Marks
• Provides reasons in favour of a preservation process used to prolong the shelf life of a named fruit or vegetable	4
• Provides a reason in favour of a preservation process used to prolong the shelf life of a named fruit or vegetable	3
• Sketches in general terms a preservation process used to prolong the shelf life of produce	2
• Provides relevant information about preserving food	1

Sample answer:

Chilling is an example of a preservation process that could prolong the shelf life of strawberries. The reason this process is suitable is because it removes favourable conditions required by enzymes and bacteria to grow. By chilling a strawberry that is clean and undamaged the shelf life can be extended by approximately five days which makes it more convenient for the consumer as it reduces the number of times they need to go to the marketplace to purchase strawberries.

Answers could include:

- Drying
- Canning
- Freezing.

Question 24 (c)

Criteria	Marks
<ul style="list-style-type: none"> Relates cause and effect between food product developers and consumer demands for health Provides appropriate examples 	6
<ul style="list-style-type: none"> Provides characteristics and features of how food product developers have responded to consumer demands for health Provides an appropriate example/s 	4–5
<ul style="list-style-type: none"> Sketches in general terms how food product developers have responded to consumer demands for health 	2–3
<ul style="list-style-type: none"> Provides relevant information about food product developers or consumer demands for health 	1

Sample answer:

Food product developers have made a vast contribution to providing consumers with a range of products that respond to their concerns for health such as a breakfast manufacturing company enhancing the health of their food product by using organically grown wheat as an ingredient. Some companies have also further developed their product range by making gluten-free products that have responded to consumers with the health concern of coeliac disease. A further development that responds to consumers' demand for health is products that include fibre which can assist consumers with digestive issues.

Answers could include:

- Manufacturing banana flour that is gluten free, sugar free and has been linked to improving gut health, preventing diabetes and lowering cholesterol.
- Designing and producing cross-breed wheat that has 85% more amylose than regular wheat breeds.

Question 25 (a)

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms how food product developers have responded to the nutritional considerations for a specific group in Australia 	3
<ul style="list-style-type: none"> • Provides relevant information about the nutritional considerations for a specific group in Australia 	2
<ul style="list-style-type: none"> • Provides general information about nutritional considerations 	1

Sample answer:

The elderly require a diet that has high levels of calcium which can be found in dairy products such as milk. They also need to reduce their kilojoule consumption as they are less active. Food product developers have responded to these needs with products such as low fat or skim milk fortified with calcium.

Answers could include:

- Adolescent girls
- Pregnant and lactating women
- Postmenopausal women
- Middle-aged men who live alone
- People with health conditions (such as diabetes) that are managed by diet, or those who have a restricted diet (vegetarians)
- Athletes
- Aboriginal and Torres Strait Islander people.

Question 25 (b)

Criteria	Marks
• Sketches in general terms ONE organisation and its role in promoting health	3
• Provides relevant information about an organisation promoting health	2
• Provides general information on promoting health	1

Sample answer:

The Heart Foundation is an example of one organisation that promotes healthy heart initiatives through promoting nutrition via the Healthy Guide to Eating, the Heart Foundation tick on food labelling and promoting Healthy Canteen Programs in schools and sporting organisations.

Answers could include:

- Health programs (Weight Watchers, gyms)
- Meals on Wheels
- Diabetes Australia
- CSIRO.

Question 25 (c)

Criteria	Marks
• Makes evident the cause and effect of the physical consequences of malnutrition	4
• Provides characteristics and features of the physical consequences of malnutrition	3
• Sketches in general terms the physical consequence/s of malnutrition	2
• Provides relevant information on malnutrition	1

Sample answer:

Not consuming the correct amount of nutrients can lead to malnutrition and have physical consequences for an individual. The physical consequence of not consuming the correct amount of the mineral calcium is osteoporosis which leads to brittle bones and the increased risk of bone fractures. Another physical consequence of malnutrition could be constipation due to lack of fibre in the diet. This in turn can lead to further consequences such as diverticulitis and bowel cancer.

Answers could include:

- Obesity
- Cardiovascular disease
- Type 2 diabetes
- Dental caries.

Question 26

Criteria	Marks
<ul style="list-style-type: none"> • Makes evident a relationship between a chosen Australian food industry organisation and providing consumers with quality assurance • Examples provided 	6
<ul style="list-style-type: none"> • Provides characteristics and features of how a chosen Australian food industry organisation has provided consumers with quality assurance • Example(s) provided 	4–5
<ul style="list-style-type: none"> • Sketches in general terms how the Australian food industry has provided consumers with quality assurance 	2–3
<ul style="list-style-type: none"> • Provides relevant information on the Australian food industry and/or quality assurance 	1

Sample answer:

Food retailer organisation such as supermarkets provide quality assurance to consumers in a number of ways. Stores have a standard of presentation that must be maintained at all times, eg any spills or breakages are cleaned up immediately. The presentation of workers is always to a high standard. Clean uniforms and neat appearance indicate to the consumer that produce and food items are being handled correctly. Temperature sensors on fridges and freezers assure customers that foods such as frozen foods are correctly stored to maintain quality. Checks are regularly done to ensure that food products on the shelf are within the use-by date. Any products that have damaged packaging are removed from sale. These steps ensure that the consumers shopping at this supermarket are provided with quality assurance.

Answers could include:

Answers will depend on which organisation the student has studied.

Section III

Question 27 (a)

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms TWO pieces of legislation that would need to be followed by the food manufacturer during the development of the new fruit juice 	3
<ul style="list-style-type: none"> • Sketches in general terms ONE piece of legislation that would need to be followed by the food manufacturer during the development of the new fruit juice 	2
<ul style="list-style-type: none"> • Provides relevant information on food legislation and/or developing new food products 	1

Sample answer:

During the manufacture of this product, the food manufacturer would have to follow workplace health and safety legislation. This means that all of the workers would need to be trained to use the machines and there would need to be safety signage in the factory. Another piece of legislation that would need to be followed is the NSW Food Act. This ensures that the food is produced in a safe and hygienic way and is fit for human consumption.

Answers could include:

- FSANZ Act
- Protection of the Environment Act
- Competition and Consumer Act.

Question 27 (b)

Criteria	Marks
<ul style="list-style-type: none"> • Provides characteristics and features of a test that could be conducted to determine the suitability of the proposed packaging for the newly developed fruit juice 	4
<ul style="list-style-type: none"> • Sketches in general terms a test that could be conducted to determine the suitability of the proposed packaging for the newly developed fruit juice 	3
<ul style="list-style-type: none"> • Provides relevant information on a suitable test that could be used for the newly developed fruit juice 	2
<ul style="list-style-type: none"> • Provides relevant information on food packaging 	1

Sample answer:

The fruit juice could be packaged in a clear, rigid plastic bottle with a screw top plastic lid. One test that could be conducted to determine the suitability of this packaging would be a drop test. This would involve dropping the container from different heights to see that the plastic bottle was strong enough to withstand movement during transportation when moving between the warehouse and retailers as well as when moving from a retailer to a consumer's home/workplace.

Question 27 (c)

Criteria	Marks
<ul style="list-style-type: none"> • Demonstrates a detailed relationship between the identified nutritionally modified juice and the health of Australians 	8
<ul style="list-style-type: none"> • Demonstrates a relationship between the identified nutritionally modified juice and the health of Australians 	6–7
<ul style="list-style-type: none"> • Provides characteristics and features of the advantage(s) of consuming the nutritionally modified juice 	4–5
<ul style="list-style-type: none"> • Sketches in general terms the advantage(s) of consuming the nutritionally modified juice 	2–3
<ul style="list-style-type: none"> • Provides relevant information about and/or example(s) of nutritionally modified food(s) 	1

Sample answer:

When foods such as juice are nutritionally modified there are many health benefits for the Australians that consume them. That is why they are a popular choice at the supermarket and on the increase in their development from food manufacturers.

Obesity is a major health concern for Australia. The percentage of Australians who are overweight or obese is on the rise. By consuming a juice with 50% less sugar Australians will benefit by having less sugar and kilojoules in their diet. This may reduce the risk of overweight and obesity which will reduce the risk of other related health conditions eg type 2 diabetes and dental caries.

Dietary fibre is responsible for keeping the digestive system regular and ridding the body of waste. By consuming this nutritionally modified juice, a person can improve their health and reduce their risk of constipation, diverticulitis and bowel cancer. Foods that contain added fibre, such as the juice, can benefit Australians as they can reduce the risk of fibre deficiency and therefore improve their overall health.

Therefore, there are many health benefits and examples where Australians can improve their health by consuming the nutritionally modified juice.

Section IV

Question 28

Criteria	Marks
<ul style="list-style-type: none"> Makes evident a judgement on how sectors of the Australian food industry have responded to societal changes and consumer demands for convenience Provides a logical and cohesive response with relevant examples and terminology 	13–15
<ul style="list-style-type: none"> Provides a relationship between sector(s) of the Australian food industry and societal changes and/or consumer demands for convenience Provides a logical and cohesive response with examples and terminology 	10–12
<ul style="list-style-type: none"> Provides characteristics and/or features of how sector(s) of the Australian food industry have responded to societal changes and/or consumer demands for convenience 	7–9
<ul style="list-style-type: none"> Sketches in general terms how sector(s) of the Australian food industry have responded to societal changes and/or consumer demands for convenience 	4–6
<ul style="list-style-type: none"> Provides relevant information on sector(s) of the Australian food industry and/or societal changes and/or consumer demands for convenience 	1–3

Sample answer:

Australian consumers are busy and therefore need to save time when preparing food for their families and friends. As a consequence, they look to buy convenience foods that save them time. The Australian food industry has effectively responded to these demands in a number of ways.

Many retailers now sell freshly prepared, ready to eat meals. For example – a supermarket may pre-slice cold meat and cheeses and have them wrapped in plastic wrap on a tray ready for consumers to take from the delicatessen section. This then saves consumers time when purchasing their groceries as they don't need to wait for service.

Many retailers now have online purchasing and home delivery or a 'click and collect' service. This allows consumers to save time by ordering food items online or via an app and then picking up their food later or having it delivered to their home for a small fee. These initiatives provide consumers with a lot of convenience as they don't lose time shopping and if they have mobility issues or small children it makes it a lot easier for the food to be delivered to them.

The availability of smaller and individual serves of food reflects the changing nature of Australian households with more and more people living alone. An example – individual sized servings of salad greens, half loaf bread, 2 pack packaged bread rolls from supermarket bakery.

Therefore, the food retail sector has effectively and positively responded to both societal changes in Australia as well as consumers' demand for convenience.

The food manufacturing sector has also responded to societal changes and consumer demands for convenience. Many processed foods now come in a range of sizes that reflect the different types of households in the Australian community. One example is how food items now come in single serve sizes. This is in direct response to the number of Australians

who now live alone, eg Heinz Soup for One. Another example is the range of frozen meals that can be purchased in single serve size, eg Lean Cuisine.

Another societal change in Australia is that the population is living longer. Food manufacturers are now producing food that is suited to the elderly. Foods such as high calcium milk are aimed at the elderly who need these types of products for improved health and to reduce their risk of osteoporosis. High fibre cereals are also aimed at the elderly market as they need to consume high fibre diets to prevent constipation and reduce their risk of other bowel related disorders.

The food manufacture sector of the Australian Food Industry has also responded to consumer demands for convenience. This has occurred with both the types of food they are producing and the packaging they are using.

For example, many pre-prepared and partially prepared foods are very convenient for consumers. It saves them time and in some cases money. It also allows busy consumers to have a wide range of foods available to them, eg 2-minute rice packs, ready-made pasta sauces, frozen meals.

Food packaging can also be very convenient. 2-minute noodle meals allow consumers to eat straight from the package. These products also provide a utensil to make eating the item even easier. Many pre-packaged frozen meals come with utensils too. This means that consumers can access hot meals at any time of the day with the convenience of being able to eat without needing additional cutlery or crockery.

Therefore, the food manufacturing sector has effectively and positively responded to both societal changes in Australia and consumers' demand for convenience.

Answers could include:

- Food service and catering: home delivery, delivery apps, family value pack meals
- Agriculture and fisheries: pre-packaged salad mix, pre-packaged herbs, individual serves of salad, pre-sliced fruit
- Food manufacturing: vegan and plant-based foods, reduced servings sizes, pre-packaged foods.

2021 HSC Food Technology Mapping Grid

Section I

Question	Marks	Content	Syllabus outcomes
1	1	FM: Food additives	H1.1
2	1	FPD: Line extensions	H1.3
3	1	FM: Food preservation	H4.2
4	1	NUT: Specific groups	H2.1
5	1	AFI: Legislation	H1.2
6	1	NUT: Dietary disorders	H2.1
7	1	FM: Equipment	H4.2
8	1	AFI: Sectors of AFI	H1.2
9	1	AFI: Career opportunities	H1.2
10	1	FPD: 4 Ps	H1.3
11	1	NUT: Media and ethical issues	H2.1
12	1	NUT: Allergies	H2.1
13	1	AFI: Advisory groups	H1.2
14	1	FPD: External factors	H1.3
15	1	FPD: Drivers	H1.3
16	1	FPD: Steps in FPD	H1.3
17	1	NUT: Functional foods	H2.1
18	1	AFI: Impact on economy	H1.2
19	1	NUT: Active non-nutrients	H2.1
20	1	FM: Current developments in packaging	H4.2

Section II

Question	Marks	Content	Syllabus outcomes
21 (a)	2	FPD: Steps in developing a new food product	H1.3
21 (b)	4	FPD: Conducting a SWOT analysis	H1.3
22 (a)	2	AFI: Emerging technologies in AFI	H1.2
22 (b)	4	AFI: Emerging technology in a sector of AFI	H1.2
23 (a)	2	FM: Characteristics of equipment in food production	H1.1
23 (b)	3	FM: Raw material specifications	H1.1
23 (c)	4	AFI: Waste management	H1.4
24 (a)	3	FM: Causes of food spoilage/deterioration	H4.2
24 (b)	4	FM: Preservation methods	H4.2
24 (c)	6	FPD: Market concern for health	H1.3
25 (a)	3	NUT: Nutritional consideration for specific groups	H3.2
25 (b)	3	NUT: Role of an organisation in promoting health	H5.1
25 (c)	4	NUT: Malnutrition	H2.1
26	6	AFI: Organisation and quality assurance	H3.1

Section III

Question	Marks	Content	Syllabus outcomes
27 (a)	3	AFI: Government legislation	H1.2
27 (b)	4	FM: Packaging and packaging testing	H1.1
27 (c)	8	NUT: Nutritionally modified foods and health	H2.1

Section IV

Question	Marks	Content	Syllabus outcomes
28	15	AFI/FM/FPD: Responding to consumer demands and societal changes	H1.3, H1.2, H1.4, H3.1