

# 2022 VCE Food Studies external assessment report

## General comments

The 2022 Food Studies examination assessed Units 3 and 4 of the *VCE Food Studies Study Design 2017–2022*. Section A comprised 15 multiple-choice questions worth one mark each. Section B comprised 11 short-answer questions worth 75 marks and one extended-response question worth 10 marks. The examination included questions reflecting the interconnectedness of different areas of study as well as the relationship between key knowledge and key skills in the study design.

This report should be read in conjunction with the 2022 VCE Food Studies examination.

In Section B, some students were unable to tailor the content of their responses to the focus of the questions, or demonstrate the key skills linked to related areas of study. Many students did not utilise the information provided in the question stem and were therefore unable to effectively address the focus of the question, resulting in non-specific answers. This was particularly evident in Questions 5a. and 11c. Students are advised to read questions carefully to ensure they are using the information accordingly to what is being asked.

Where students had to apply key knowledge to a given context or scenario, many were unable to make meaningful connections or provide relevant examples to support their response. This was particularly evident in responses to Questions 3, 5b., 6a. and 8a.

Areas of strength included demonstrating an understanding of:

- preventative practices for a safe food supply
- benefits of genetic modification of food production
- key behavioural principles for the establishment of healthy diets
- current trends in food behaviours
- ethical concerns affecting food choice.

The following key knowledge areas require improvement:

- knowledge of low-impact farming
- environmental effects of food wastage
- biological reasons for differences in dietary requirements
- identification of social factors and how they influence food choice and healthy eating
- the link between food selection and lifestyle diseases
- evidence-based principles used in the development of the Australian Dietary Guidelines
- the microbiology of the intestinal tract
- enzymatic hydrolysis
- optional information contained on food labels and their purpose.

Students also needed to improve in these areas:

- utilising the stimulus to inform the response
- providing relevant examples to support key knowledge
- addressing all elements of the question
- analysing diverse points of view.

For short-answer questions and the extended response, students should clearly address each question as it is asked and ensure that any examples they provide are relevant. Students are reminded of the need to read all elements of the question, consider the command words and mark allocation, plan their responses so they are clear, and answer what is being asked.

## Specific information

Student responses reproduced in this report have not been corrected for grammar, spelling or factual information.

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding, resulting in a total of more or less than 100 per cent.

## Section A – Multiple-choice questions

The following table indicates the percentage of students who chose each option. The correct answer is indicated by shading.

| Question | Correct answer | % A       | % B       | % C       | % D       | Comments   |
|----------|----------------|-----------|-----------|-----------|-----------|--|
| 1        | D              | 7         | 34        | 3         | <b>56</b> | The weight information provided on food labels refers to the total amount of the product. The quantity of each ingredient refers to percentage labelling.  |
| 2        | A              | <b>67</b> | 15        | 9         | 9         |  |
| 3        | C              | 5         | 19        | <b>61</b> | 15        |  |
| 4        | B              | 5         | <b>92</b> | 2         | 2         |  |
| 5        | D              | 2         | 1         | 3         | <b>95</b> |  |
| 6        | A              | <b>88</b> | 0         | 11        | 0         |  |
| 7        | A              | <b>59</b> | 7         | 9         | 25        |  |
| 8        | B              | 48        | <b>23</b> | 10        | 18        | The question focused on a practical way to apply food and health recommendations; students needed to select the response that represented a behavioural approach. Option A focuses on knowledge transfer, therefore does not reflect practical application. Option B focuses on a specific behaviour that represents the evidence-based recommendations relating to food and health, therefore providing a practical approach. |
| 9        | D              | 3         | 3         | 2         | <b>92</b> |  |
| 10       | D              | 9         | 10        | 7         | <b>74</b> |  |
| 11       | C              | 14        | 3         | <b>73</b> | 9         |  |
| 12       | A              | <b>54</b> | 4         | 21        | 21        | Students were asked to identify a physical change during cooking; this would result in the aquafaba becoming firm in texture rather than remaining light and fluffy as stated in Option  |

| Question | Correct answer | % A       | % B       | % C       | % D | Comments   |
|----------|----------------|-----------|-----------|-----------|-----|--|
|          |                |           |           |           |     | C. Option D focuses on a chemical change, therefore not addressing the question.   |
| 13       | B              | 4         | <b>58</b> | 25        | 13  |  |
| 14       | C              | 10        | 8         | <b>76</b> | 6   |  |
| 15       | A              | <b>18</b> | 60        | 16        | 5   | Yoghurt forms when the lactose ferments and is converted to lactic acid. The question stem provided adequate information for students to respond to the question. The last sentence within the question stem referring to yoghurt states 'the bacteria convert the lactose (milk sugar) to lactic acid'. Although heat is mentioned in the stimulus, it is not required for the reaction. The focus was on application of skill through utilising the stem to inform their response. |

## Section B

### Question 1

| Marks | 0 | 1  | 2  | 3  | Average |
|-------|---|----|----|----|---------|
| %     | 7 | 26 | 25 | 43 | 2.1     |

Responses needed to focus on the importance of heat in the destruction of bacteria found in raw foods.

A suitable response could have included the following:

- Smoothies that contain raw food such as eggs are considered high-risk for food poisoning as they may contain *Campylobacter*. The bacteria are not subjected to heat during the formation of the smoothie, therefore are not destroyed in the process.
- Raw foods can contain food-poisoning bacteria. It is recommended that raw foods such as eggs should not be used in smoothies as there is no heat applied; therefore the bacteria are not destroyed during the cooking process, increasing the risk of food poisoning.

The following is an example of a high-scoring response.

*Including raw foods is not advised due to bacteria content. Raw food often contains bacteria, such as *Campylobacter*, and is only killed when heated to temperatures above 60°C. Thus, including raw foods, such as eggs in smoothies, which have not been cooked to this temperature may lead to consumption of pathogens which can cause food poisoning.*

### Question 2a.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 42 | 34 | 24 | 0.8     |

A suitable response could have included two of the following:

- Minimises land degradation through the choice of crops and planting methods
- Promotes biodiversity through crop selection and maintaining soil health
- Reduces the risk of soil acidification as there is a decreased use of synthetic chemicals
- Enhances soil nutrition through crop rotation
- Utilises less land than conventional farming methods, and may reduce impacts on environmental sustainability.

Responses needed to outline rather than simply state an advantage.

The following is an example of a high-scoring response.

*Low impact farming aims to conserve the soil so that nutrients remain high thereby providing crops optimal conditions to grow and decreasing the use of chemicals. Low impact farming also helps the soil retain its moisture to decrease soil erosion and therefore the loss of topsoil.*

## Question 2b.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 23 | 31 | 46 | 1.2     |

A suitable response could have included two of the following:

- Higher resistance to insects/pests, which can increase crop yield
- Can increase the nutrient composition of plants
- Higher resistance to impacts of weather conditions
- Can increase the shelf life of foods, reducing food waste
- Can be modified to result in higher-yielding crops
- Reduced fertiliser requirements benefiting the environment.

Responses needed to outline rather than simply state an advantage.

The following is an example of a high-scoring response.

*One benefit is it can improve yield, as crops can be genetically modified to be resistant to drought.  
Another benefit is GM food can be resistant to herbicides, which kill weeds that fight crops for nutrients.*

## Question 2c.

| Marks | 0  | 1  | 2  | 3  | 4  | 5 | 6 | Average |
|-------|----|----|----|----|----|---|---|---------|
| %     | 28 | 14 | 19 | 17 | 12 | 5 | 3 | 2.0     |

Responses needed to focus on diverse points of view, and provide both challenges and advantages of low-impact farming and GM food-production methods as possible pathways to achieving food security in Australia.

Many students simply provided descriptions of the farming/food-production methods. Responses did not often address diverse points of view or link the information to food security within an Australian context.

A suitable response could have included the following:

Low-impact

- Advantages
  - Use of sustainable practices improves soil fertility, optimising crop yield
  - Minimises the risk of soil acidification, and therefore land degradation
  - Reduces land degradation, enabling a more sustainable food supply
  - Promotes biodiversity, enhancing soil health, clean waterways and pollination
- Challenges
  - Reduced herbicide use may result in crops being more susceptible to weeds, reducing yield
  - Reduced yield compared to GM or conventional farming methods, reducing food availability
  - Can be more expensive price-point for the consumer, impacting food affordability
  - Converting can be time consuming and costly

GM food production

- Advantages
  - Can be drought-resistant, therefore maintaining a food supply in harsher climates
  - Less wastage as crops can withstand drought or other weather conditions
  - Insect and bird life can be improved by the reduction of use of pesticides and herbicides
  - Can increase nutrients as crops can be modified to have greater nutritional value
  - Increased shelf life resulting in reduced food waste

- Challenges

- Cost of moving to GM food production systems can be high, resulting in a more expensive price-point for consumers
- Traditional crops could be contaminated by GM grain, impacting other primary food producers
- Vegetarians could be concerned if animal genes are introduced into the plant
- May go against consumers' values/ethics
- Requires new knowledge and skills to be established for primary food producers, limiting uptake of GM food production

This question was not well answered.

The following is an example of a high-scoring response.

*Whilst both low impact farming and GM food production certainly have many benefits, many critics remain sceptical of their benefits.*

*Firstly, low impact farming minimises the use of synthetic chemicals. This protects the soil health, as well as ensuring local waterways are not contaminated. By protecting these natural resources, sustainability is ensured, allowing foods to continue to be grown year after year. However, low impact farming practices, such as organic farming and crop rotation, also produce lower yields than conventional farming methods, as synthetic fertilisers help produce more crop yield, and crop rotation means entire fields produce minimal crops some seasons. This lower crop yield means more land must be cleared to produce the same amount of food, and more land cleared means less natural biodiversity, and less forested land for carbon sequestering, a negative environmental impact. Therefore, whilst low impact farming improves sustainability, it may also harm the environment in other ways.*

*GM food production is beneficial as it allows for higher crop yield, and also the production of nutrient dense crops – such as Golden Rice, which contains higher levels of Vitamin A. This can help combat malnutrition and reduce food insecurity by making the price of rice and other GM foods cheaper. However, many critics of GM foods are worried about GM food crops being carried to other fields, through the wind or through water, and contaminating the other farms crops. This could cause unwanted transgenic plants, could jeopardise the other farms organic status, or could potentially harm biodiversity This means sceptics want more research done into the possible harmful effects of GM food, given it is a relatively new technology.*

*Both low impact farming and GM food production can help achieve food security, but may also harm it.*

### Question 3

| Marks | 0 | 1 | 2  | 3  | 4  | 5  | 6  | Average |
|-------|---|---|----|----|----|----|----|---------|
| %     | 6 | 5 | 11 | 22 | 17 | 13 | 25 | 3.8     |

Responses needed to clearly link each key behavioural principle to the increased consumption of the vegetables and legumes/beans food group by children. For full marks students needed to refer to the consumption of the food group in reference to each key behavioural principle.

Many students were too vague, not tailoring the answer to the specific key behavioural principle in question, or offering generalised descriptions of the principles, without referencing the food group.

A suitable response could include the following.

Exposure:

- Providing vegetables/legumes/beans in different family meals creates new experiences around this food group for children, increasing their familiarity with the food, working to optimise their consumption of vegetables/legumes/beans.

- Parents providing vegetables/legumes/beans in a variety of different forms and flavours provides a variety of experiences with this food group. Children can also be exposed to the food in a number of settings, such as gardening, shopping, food preparation and in books. Positive exposure to the food group works to increase children's consumption of the foods.

#### Repetition:

- Parents consistently introducing vegetables/legumes/beans to children increases their familiarity with the food. This can be done by providing the food group at different times throughout the day, and in a variety of forms. This increases the likelihood of children trying the food, increasing their consumption as it then becomes normalised as part of their regular diet.
- If vegetables/legumes/beans are part of children's daily diet, the food group is familiar to them and consumption of the food group becomes a daily habit. Continuously offering vegetables/legumes/beans to children helps normalise the foods.

#### Modelling:

- Parents are seen as role models for children; therefore if children observe their parents prepare and consume vegetables/legumes/beans they would want to imitate their behaviour, increasing consumption of the food group as children mimic their parents.
- Parents can engage children with the shopping, preparation and cooking of vegetables/legumes/beans, with positive conversations and behavioural demonstration. By parents modelling these healthy habits, children will engage with the activities and will be influenced to consume the food group, as it is encouraged by their parents.

## Question 4a.

| Marks | 0  | 1  | 2  | 3  | Average |
|-------|----|----|----|----|---------|
| %     | 18 | 26 | 33 | 24 | 1.6     |

Responses needed to show an understanding of biodiversity with reference to the stimulus. Students needed to draw on the information provided to inform their response.

Many students were able to provide an example from the stimulus, but did not always effectively connect this to biodiversity, therefore not demonstrating their understanding of this concept.

The following are examples of high-scoring responses.

*Biodiversity is maintained as farmers are placing beehives in special areas not sprayed and spraying fungicide at night to maintain the bee population and not kill any. Bees then pollinate flowers to ensure healthy almond trees which ensure healthy almond fruit, for biodiversity of plants. Healthy diverse plants increases soil health thus improving diversity of microorganisms.*

*Biodiversity is being maintained by ensuring the almond trees are still sprayed with fungicide by drones and therefore not susceptible to fungus infections, which could compromise their health, whilst also protecting the health of bees, by ensuring they do not die from being sprayed. By striking this delicate balance, the almond trees can still be pollinated by the bees, and both species can thrive, thus ensuring one does not die out, which may destroy both organisms and reduce biodiversity.*

## Question 4b.

| Marks | 0  | 1  | 2  | 3  | 4  | Average |
|-------|----|----|----|----|----|---------|
| %     | 23 | 15 | 30 | 13 | 18 | 1.9     |

Responses needed to focus on how farmers might be using the drones in improving equity in food access of the almond fruit and honey.

Many students described the use of drones, but did not relate this to food access. Some students had misconceptions about the capability of drones.

A suitable response could have included the following:

Almond fruit:

- Pre-programmed drone technology enables accurate spraying of fungicide to the almond trees. This maintains the trees' health, enabling greater yield of almond fruit and therefore access to consumers. Higher yield can decrease the price of the fruit.
- Drones enable accurate fungicide spraying and monitoring of the almond trees. This can maximise crop yield as the trees are protected from the fungus. Pre-programmed drone technology can enable farmers to spend their time maintaining other aspects of the orchard, optimising output of almond fruit, enhancing equity in access for the consumer.

Honey:

- Drones spray at night when bees are in their hives, ensuring they are not harmed in the process. This leads to increased production of honey as the bee population is maintained, improving access to honey for the consumer.
- Targeted spraying of almond trees by the drones decreases the risk of bees being destroyed in the process. The drones could also be used to monitor the population of bees, to ensure their health is maintained. This enables greater production of honey, increasing food availability and access.

The following is an example of a high-scoring response.

*Drones can increase equity in food access of almond fruit as the drones are pre-programmed to kill the fungus infections meaning less almond trees have infections thus resulting in greater yield of fruit being produced that is then enabled to be distributed to be accessed by more individuals as there is more fruit.*

*With the use of drone technology bees and hives are not directly sprayed as the unmanned drones don't spray in the bee high designated area, thus resulting in more bees, more honey production and therefore more honey to be distributed to individuals to provide increasing equity as there is more honey available for more people.*

## Question 5a.

| Marks | 0 | 1  | 2  | 3  | 4 | 5 | Average |
|-------|---|----|----|----|---|---|---------|
| %     | 4 | 22 | 33 | 30 | 8 | 2 | 2.2     |

Responses needed to draw on the information provided in the question stimulus to demonstrate the role of social media in influencing food choices of young people. Students needed to draw from the positive and negative references made in the stimulus while demonstrating an understanding of the influence of social media on food choices.

Many students did not effectively draw from the stimulus to inform their response. Some students only made links to social media, which neglected key information presented in the stimulus and did not adequately address the focus of the question.

A suitable response could have included the following.

- Social media can influence food choice through advertisements, influencers, celebrity endorsements and contacts sharing or posting information, for example:
  - Influencers who have a large fan base can heavily influence young people’s food choices as they are often idolised.
  - Companies can use social media to promote their food.
  - Following a social media influencer or expert who shares healthy food options focused on increased consumption of fruit and vegetables promotes healthy food choices.
  - If family, friends or influencers post online about consuming food (such as a TikTok video sharing a healthy meal recipe or traditional recipe, or using Instagram to cook the healthy meal together live in real time), this can influence others to try the food, influencing what is consumed.
  - People can connect with formal groups online over shared interests in food. For example, a group of people might follow a nutritionist and chat about healthy eating options and current healthy food trends or online eating videos.

This question was not well answered.

The following is an example of a high-scoring response.

*Social media can have both positive and negative effects in influencing the choices of young people, as young people are likely to naturally copy what they see on social media, and are susceptible to subconsciously creating links between certain products and what they see on social media.*

*Firstly, as Appetite stated, if young people perceive their contacts to be consuming a healthy diet, they too are more likely to consume more fruit and vegetables. This means that if a positive culture is created, many young people may eat very nutritiously. Conversely, social media can also have the opposite effect, creating an unhealthy culture of ‘indulging in more junk food’, if users believe their contacts are.*

*Additionally, social media celebrities or groups can endorse healthy products, which may influence their followers to do the same, thus influencing healthy habits. However, a celebrity or company may also endorse an unhealthy product, such as the AFL’s brand deal with McDonalds, which creates a positive association between junk food and the brand, thus increasing unhealthy consumption.*

*Therefore, social media is a tool that can influence positive and negative choices.*

## Question 5b.

| Marks | 0  | 1  | 2  | 3  | 4  | Average |
|-------|----|----|----|----|----|---------|
| %     | 18 | 22 | 34 | 11 | 15 | 1.8     |

The question stem required students to focus on how social media can positively shape community responses to food information, and two examples were required. Many students focused on individual responses, rather than community. For full marks, responses needed two distinct examples, rather than drawing from the one idea.

A suitable response could have included two of the following:

- Influencers can provide information to a large range of people with posts such as ‘what I eat in a day’. This can influence their followers’ perceptions about healthy eating.
- People with shared values and beliefs come together in online groups and social media communities. These can provide a platform to share knowledge, influencing people’s responses to food information.
- If posts or accounts go viral, they get talked about in all forms of media. This allows for a community conversation about the food information claims in the post.
- Health and nutrition experts can use social media to continue to provide positive health advice and challenge myths that are shared on social media.

- Organisations such as Nutrition Australia can have pages on social media such as Instagram. They can use the platform to share healthy recipes, building the food literacy of their followers.

The following is an example of a high-scoring response.

*Social media can allow people to be a part of a group, such as joining in on a hashtag e.g. #eatgreen that encourages communities to learn about the importance of eating vegetables for their nutritional benefits, e.g. fibre. Social media is a place where new outlets can spread information about food such as recent research to show that saturated fat can lead to numerous diseases, or information about food product recalls which can reach many people and positively shape community responses as they are aware of any contaminated foods.*

## Question 5c.

| Marks | 0  | 1  | 2  | 3  | Average |
|-------|----|----|----|----|---------|
| %     | 21 | 24 | 28 | 28 | 1.6     |

A suitable response could have included the following:

- People can feel pride when using social media to film and share their cooking. Filming recipes to post on TikTok or Instagram can increase their self-worth as others like and follow along.
- People feel connected and included when cooking using social media as they are part of the process. This can be through following a live cook-along session hosted on Facebook. The individual can have a positive response and a sense of accomplishment.
- By recording a recipe and posting on social media a person may increase their confidence in the kitchen, as others follow their page and like their post.
- Following a live-stream cooking event on social media can elicit a positive response, as the person reduces their stress as they follow step-by-step instructions and feel connected to others engaging in the activity.

The following is an example of a high-scoring response.

*An individual may see a post by a famous chef such as Gordon Ramsey on Instagram, and attempt to recreate it. Successful recreation may promote a sense of confidence, pride and improved self-esteem as they share their success on social media.*

## Question 6a.

| Marks | 0  | 1  | 2  | 3  | 4 | 5 | Average |
|-------|----|----|----|----|---|---|---------|
| %     | 25 | 25 | 22 | 17 | 8 | 3 | 1.7     |

Responses needed to focus on how reducing food wastage at home addresses risks associated with the climate crisis. Students could provide additional information regarding food wastage outside the home, but this needed to supplement their response rather than be the sole focus.

Some responses that focused on packaging rather than food wastage did not effectively address the question. Many responses did not make meaningful connections between food wastage and the climate crisis; limited links were made that lacked explanation.

A suitable response could have included the following:

- Food wastage is sent to landfill, which releases greenhouse gas such as methane into the environment.
- For the food to get to the consumer many resources are required, including land, water and chemicals to grow the food, fuel to transport the food, and energy for storage and selling of the food. If the food is not eaten by the consumer, all of these resources have been wasted.

- If excess food is purchased and then wasted it puts more pressure on food systems to generate more food, resulting in greater resource and energy use.
- Household food wastage that is discarded into bins must be transported to landfill sites, resulting in energy use through transportation, contributing to greenhouse gas emissions.
- Reducing over-purchasing, ensuring food is stored appropriately and composting scraps reduces household food wastage and food-systems pressures.

This question was not well answered.

The following is an example of a high-scoring response.

*Food wastage is one of Australia's largest contributors to landfill. Decomposing food in landfill produces methane, contributing to levels of greenhouse gases. When food is wasted, the resources such as water, food and energy in creating it are also wasted. Reducing food waste at a household level can help save the amount of resources going to waste, and this can be achieved through correct storing and usage of food. It is one of the most impactful actions in addressing climate crisis as it prevents land clearing to make rubbish sites and reduces carbon emission contributing to the climate crisis.*

## Question 6b.

| Marks | 0  | 1  | 2  | 3  | 4  | Average |
|-------|----|----|----|----|----|---------|
| %     | 10 | 25 | 34 | 20 | 12 | 2.0     |

Responses needed to demonstrate an understanding of the two types date-marking requirements and how each can assist with reducing food wastage at home.

Many students were able to write about how date marking in general can assist with reducing food wastage at home, but did not always focus their response on the two types of date marking.

A suitable response could have included the following:

- Use-by dates indicate when the food should be consumed by to avoid potential health and safety risks. Consumers who have this knowledge may not over-purchase food to ensure that it does not exceed the use-by date, therefore reducing food wastage.
- Foods can be safe to consume after the best-before dates; however, the quality and sensory properties may deteriorate. This knowledge may enable people to safely consume some foods after the best-before date, therefore reducing food sent to landfill.

The following is an example of a high-scoring response.

*A use-by date is the last day a food product should be consumed otherwise individuals run the risk of food poisoning. By knowing this, individuals are able to rotate their food around and make recipes according to what is going to spoil first, therefore using the product before it goes bad. A best-before date is the last day a foods properties are the best before it starts to reduce in its sensory properties. Therefore individuals can still opt to consume the product after its best before date to stop it from going to waste.*

## Question 7a.

| Marks | 0  | 1  | 2  | 3  | Average |
|-------|----|----|----|----|---------|
| %     | 42 | 19 | 23 | 16 | 1.1     |

Responses needed to focus on one biological reason for differences in dietary requirements in relation to protein. Many students did not tailor their response to the macronutrient or provide a comparison between individuals within their answer.

A suitable response could have included the following:

- Age: Protein is required in higher amounts for people in a stage of rapid growth and development, such as adolescents during puberty. People in adulthood do not require as much protein as they are in a period of maintenance and repair.
- Sex: Men often have a greater muscle mass and are generally taller than women, so therefore require a higher intake of protein to meet the extra growth and muscle/bone mass than the average woman.
- Pregnancy and lactation: Women who are pregnant or breastfeeding require greater levels of protein than non-pregnant/lactating women, as protein is used by their bodies to feed the growing embryo and to produce milk, which itself contains protein.

## Question 7b.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 13 | 71 | 16 | 1.0     |

Responses needed to demonstrate an understanding of satiety with reference to protein. Many students were able to demonstrate an understanding of satiety, but had difficulty in explaining how protein contributes to this.

A suitable response could have included the following.

- Satiety is the feeling of fullness:
  - Protein foods are considered high-satiety as they take longer to digest, leaving you feeling fuller for a longer period of time after consumption.
  - Consumption of protein decreases the feeling of hunger as it reduces levels of ghrelin, the 'hunger hormone'.

## Question 8a.

| Marks | 0  | 1 | 2 | 3  | 4  | 5  | 6  | Average |
|-------|----|---|---|----|----|----|----|---------|
| %     | 41 | 3 | 9 | 10 | 12 | 10 | 14 | 2.3     |

A suitable response could have included two of the following:

- Education: People may be developing their understanding of the importance of regularly consuming fruit and vegetables for a nutritious and balanced diet through school and health-promotion campaigns, therefore increasing the amount they consume.
- Income: Supermarkets may be providing a greater variety of 'imperfect' fruit and vegetables, which do not meet the normal aesthetic standards. These options may be cheaper than everyday produce, therefore increasing accessibility for more people, promoting greater consumption.
- Available time: Due to changes in working from home, people may have more available time to prepare foods and may have increased fruit and vegetable use in meal planning.

- Cultural norms: Increasing shift of people towards vegetarian diets / meat-free meals. This change in eating patterns may mean people are consuming more fruit and vegetables in their daily diet, increasing consumption.
- Accommodation: People may have been growing their own fruit and vegetables at home and incorporating their fresh produce into their diet on top of their normal consumption rather than substitution.
- Location: Accessibility of fruit and vegetables, both fresh and preserved, may be increasing in both urban and rural settings. This may have seen increased consumption of fruit and vegetables.

The following is an example of a high-scoring response.

*Cultural Norms such as individuals choosing plant based diets such as veganism or vegetarianism have increased as a common trend. These diets involve consuming plant-based alternatives meaning the consumption of fruit and vegetables is substantial, this may explain the 1 in 3 increase.*

*Education has increased overtime as people's nutrition, health and food literacy has increased such as more individuals eating according to the AGTHE and ADGs as they have been education about these initiatives thus individuals may be incorporating more nutritious fruit and vegetables into their diet as it aligns with the AGTHE and thus may explain the trends.*

## Question 8b.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 36 | 36 | 28 | 1.0     |

The focus of the question was the link between fruit and vegetables and health. Many students were able to identify a health benefit, but did not adequately explain the link.

A suitable response could have included the following:

- Fruit and vegetables are high in fibre;
  - a high-fibre diet reduces the risk of cardiovascular disease.
  - therefore their consumption can provide a feeling of fullness, reducing the risk of obesity from overeating.

The following is an example of a high-scoring response.

*Fruits and vegetables are sources of antioxidants. Antioxidants serve to fight free radicals in the body, and can prevent the onset of cancer, thus an increased consumption of fruits and vegetables can decrease cancer.*

## Question 9

| Marks | 0  | 1  | 2  | 3  | Average |
|-------|----|----|----|----|---------|
| %     | 54 | 19 | 14 | 13 | 0.9     |

A suitable response could have included the following:

- Developed through a rigorous research methodology that follows the National Health and Medical Research Council (NHMRC) guidelines, the Australian Dietary Guidelines (ADGs) are based on over 55,000 pieces of evidence-based research, a large sample size and research that was recent or within the last 10 years, providing the best scientific advice for healthy eating.
- Accurate and reliable information on healthy eating is provided because of the quality, quantity and level of evidence that the ADGs are based on. Evidence from reputable scientific studies has been used to write the ADGs, and this research was graded according to NHMRC protocols.

- The development of the ADGs was overseen by a team of credible sources, consisting of experts in the field of health, nutrition and food, to ensure findings are objective, unbiased and statistically significant.

This question was not well answered.

The following is an example of a high-scoring response.

*The ADGs were reviewed and developed by a committee of leading experts in the field of nutrition, public health and the food industry. The process was overseen by the National Health and Medical Research Council (a reputable federal government organisation). Over 55,000 pieces of peer-reviewed scientific research were assessed, and a critical appraisal process was used to grade these from A (highly reliable) to D (use with caution).*

## Question 10a.

| Marks | 0  | 1  | 2 | 3 | Average |
|-------|----|----|---|---|---------|
| %     | 77 | 12 | 7 | 5 | 0.4     |

Responses needed to focus on microorganisms. A common misconception among students was the reference to digestive enzymes.

A suitable response could have included the following:

- Microorganisms in the small intestine can help protect the body against harmful pathogenic bacteria. These healthy bacteria feed off foods high in fibre and work to destroy harmful bacteria present in the digestive system, supporting immune health.
- Microorganisms in the small intestine can assist people with lactose intolerance to consume small amounts of foods containing lactose because they work to digest lactose. This enables lactose to be broken down into monosaccharides, which can be absorbed by the body, preventing diarrhoea and supporting digestive health.

This question was not well answered.

The following is an example of a high-scoring response.

*One role microorganisms play is destroying or neutralising pathogens and other 'bad bacteria' to help reduce the risk of an individual becoming sick or otherwise in ill health. The millions of microorganisms that live in the small intestine work together to combat pathogens that enter the body, identifying things such as bacteria, and destroying them via processes such as phagocytosis. When microorganisms are depleted, pathogens may enter the body and not be destroyed or neutralised and cause an individual to become ill. A healthy small intestine microbiome is important in preventing sickness.*

## Question 10b.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 60 | 25 | 15 | 1.0     |

Responses needed to focus on enzymatic hydrolysis. Students could demonstrate their understanding of this concept by generally describing it in reference to enzymes, or focus on a specific macronutrient.

A suitable response could have included the following:

- Breaks the molecular bonds of macronutrients during digestion, which enables nutrients to become single units small enough for absorption in the small intestine
- Digestive enzymes break the bonds in macronutrients with the addition of water, for example
- Proteins being broken into amino acids
- Fats into glycerol and fatty acids

- Carbohydrates into monosaccharides.

The following is an example of a high-scoring response.

*Enzymatic hydrolysis involves enzymes breaking down the molecular building blocks of foods so that they can then be absorbed and utilised by the body, for example, enzymes breaking down proteins into amino acids.*

## Question 11a.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 14 | 36 | 51 | 1.4     |

A suitable response could have included the following:

- Eggs are affordable to purchase and provide a good source of protein that forms part of many recipes, or they can be eaten as a snack.
- Plays a social role: having a poached egg at brunch with friends is a staple food in many cafés and restaurants, increasing consumption rates.
- Can be used in a variety of ways including quiches, cakes, condiments and on its own. Their versatility across a number of recipes increases their use and consumption.
- They are a common ingredient across many different cuisines.
- With more people becoming vegetarian, eggs are a good alternative to meat as a protein source.

The following is an example of a high-scoring response.

*Eggs serve as a good source of protein to help with muscle growth/repair. They are relatively cheap compared to foods such as red meat and fresh chicken, yet produce similar nutritional benefits.*

## Question 11b.

| Marks | 0  | 1  | 2  | Average |
|-------|----|----|----|---------|
| %     | 19 | 41 | 40 | 1.2     |

A suitable response could have included the following:

- As consumers are becoming more ethically concerned about animal welfare, they may be selecting free-range eggs, which may support better conditions for hens.
- Free-range eggs may provide better living conditions for hens compared to caged eggs. Hens may be more likely to express normal patterns of behaviour in outdoor environments. This may align with consumer values, therefore increasing purchase of free-range eggs.

The following is an example of a high-scoring response.

*Although caged eggs tend to be cheaper, given it can produce a higher volume of eggs, recent campaign by organisations such as the RSPCA (Set a Sister Free) have raised awareness for the inhumane treatment of caged eggs, whereas free range eggs are kept more naturally, with enough space to exhibit natural behaviours such as scratching. This means consumers are more willing to buy free range, and therefore in recent years, have bought 52% free-range, and only 32% caged eggs.*

## Question 11c.

| Marks | 0  | 1  | 2  | 3  | Average |
|-------|----|----|----|----|---------|
| %     | 33 | 35 | 22 | 10 | 1.1     |

Responses needed to focus on egg-farming practices in the context of winter. Students needed to draw from information presented in the stimulus.

A suitable response could have included the following:

- Free-range egg production is less consistent compared to cages or barns in winter months.
- Producers of free-range eggs have not been able to keep up supply due to cold weather conditions, with hens' productivity reduced by 20% in winter.
- Free-range hens are affected by shifts in temperature, changes in weather conditions and reduction in length of daylight; this reduces the number of eggs they produce in winter.
- There is more free-range egg farming due to a greater demand for free-range eggs but this demand cannot be met in winter months as the egg supply is less reliable.

This question was not well answered.

The following is an example of a high-scoring response.

*In winter, there are colder temperatures that free range hens are exposed to, decreasing their egg production compared to caged hens which experience heat regulated confinement. In winter there is more rainfall which decreases or damages egg production for free range hens, compared to caged hens which are protected from the elements. In winter there are short exposure to daylight and free range hens experience more darkness, decreasing egg production than hens which have regulated 16 hours of light each day.*

*As more Australians are consuming free range eggs than caged eggs, this greatly contributes to the egg shortage as they are depleting egg sources from the produce affected by winter, compared to the egg supplies from caged hens.*

## Question 12

| Marks | 0  | 1  | 2  | 3  | 4  | 5 | 6 | 7 | 8 | 9 | 10 | Average |
|-------|----|----|----|----|----|---|---|---|---|---|----|---------|
| %     | 13 | 15 | 19 | 17 | 13 | 9 | 5 | 4 | 3 | 2 | 1  | 3.0     |

Students needed to draw from the information provided in the stimulus to support their response. Responses needed to address all three dot points and make a judgment about the use of the Health Star Rating system. A high-scoring response provided relevant examples of optional labelling components, detailed their advantages and purpose, considered how the source and purpose led to the increased validity of the Health Star Rating System, and provided relevant examples of lifestyle diseases while considering how food selection can lead to or inhibit the onset of these diseases.

Many students struggled to discuss optional information contained on food labels, with many focusing on compulsory components only. Some students were able to effectively draw from the stimulus but then failed to build on this information to inform their response.

In evaluating the statement in the question stem, students may argue that the statement is accurate, as the Health Star Rating system is based on the recommendations of the Australian Dietary Guidelines (ADGs). They may have also argued against the statement as the Health Star Rating system can be misleading because it is not included on all food packages, therefore accurate comparisons cannot be made.

Responses could have included some of the following information that relates to each of the three dot points in the stem.

- Optional information contained on food labels, the purpose behind optional information and the advantages of accurate food labelling to consumers
  - The Health Star Rating system is in addition to the compulsory nutrition information panel.
  - Other optional labelling components include serving suggestions, nutrition information per serve, barcodes, nutrition content claims and health claims.
  - The main purpose of optional information labelling is to provide further information to consumers; it also benefits food manufactures, to promote sales and increase consumer product knowledge.
  - The advantage of accurate food labelling is that it ensures consumers can make informed choices that support their health and safety.
  - This statement clearly shows that the label is being read and comprehended by the parent who is passing his information onto their child. It is meeting its purpose of informing the consumer. However, the information may be interpreted incorrectly because dissimilar products are being compared, so the Health Star Rating system may not be advantageous to the consumer.
- The source and purpose, as criteria to assess the validity of the Health Star Rating system
  - Source: The Health Star Rating system was developed by the Australian, state and territory governments, in association with industry, public-health and consumer groups.
  - Government organisations use credible sources and evidence-based information when developing health recommendations; therefore the main source is valid.
  - Food industries have a commercial interest, which could compromise the validity.
  - Purpose: The system is designed so that a consumer can make a comparison between two similar products simply and quickly; this may support consumers to choose ‘healthier’ products to help prevent obesity and related lifestyle diseases.
  - The purpose of the Health Star Rating system can be considered valid as it is intending to provide consumers with accurate information.
  - The validity of the Health Star Rating system can be questioned if the purpose of the optional labelling component is to persuade consumers, rather than inform them.
- The ways in which food selection can assist in the prevention of obesity and related lifestyle diseases
  - Selecting foods with increased fibre, as depicted on the Health Star Rating system, may provide greater levels of satiety, reducing the risk of obesity.
  - Selecting foods with decreased salt and added sugar, as depicted on the Health Star Rating system, may reduce the risk of lifestyle diseases such as hypertension, cardiovascular disease and type 2 diabetes.
  - The Health Star Rating system provides information to the consumer regarding particular nutrients in an accessible and easy-to-read form, which facilitates comparing between products of a similar type, and may be making it easier for consumers to make a better choice with regards to reducing obesity and other lifestyle diseases.
  - The Health Star Rating system compares similar foods, so discretionary foods may be considered ‘healthier’ based on their star rating rather than their nutrient content, and so would not be the best choice to prevent obesity and related lifestyle diseases.
  - Consuming foods with more stars according to the Health Star Rating system may mean a consumer is taking in higher levels of fibre. This may reduce weight gain and associated conditions such as obesity and cardiovascular disease.
  - The Health Star Rating system may not provide the best measure in selecting food to prevent obesity and related lifestyle diseases as it is only on packaged products; fresh fruit and vegetables are excluded.

The following is an example of a high-scoring response.

*Whilst Health Star Ratings can assist in making healthy food selections, they are not always indicative of a food being “good for [you]”, as the statement suggests. Despite being a fairly good system there are still limitations.*

*The Health Star Rating system is a voluntary labelling system to rate 'similar packaged food products from 0.5 to 5 stars'. This can help consumers make informed decisions by comparing like products when in the supermarket. However, like other optional food information, such as serving suggestion and nutrition content claims, the rating system is limited, and may be misleading.*

*The purpose of option information on food packaging is to provide the consumer with more information about the produce, however, it can also be used as a marketing tool by companies to take advantage of consumers. For example, a package may have a nutrient content claim "low in fat". This may cause the health halo effect, which is where the consumer associates a phrase with the product automatically being healthy, and may therefore assume this produce is healthy. In fact, the product may still be high in sugar and energy and lack nutrients. Similarly, the Health Star Rating System only compares against like products. So, whilst a breakfast cereal with the "best Health Star Rating" is likely to be fairly nutritious, it is important to note it is being compared to other breakfast cereals, which may all be incredibly high in sugar and saturated fat. This means it is not necessarily "good for [you]", as the Health Star Rating is fairly useless if you are comparing different sorts of products – such as cereal to a fruit cup. As with nutrition content claims, companies can manipulate their health star rating by "increasing fibre or decreasing salt" which may only minimally change the nutritional value of the food. However, when accurately included, and not intentionally manipulated by marketers, food labelling on packages is important in helping consumers choose the product that best suits them – whether that be avoiding allergens, reducing sodium intake or choosing the more nutritious product.*

*The Health Star Rating System is fairly valid. The Systems source is the "Australian federal, state and territory governments", who are unbiased, and fairly certified. This reliable source increases the validity of the Health Star Rating System. The purpose is to allow consumers to compare like products. This purpose is a valid one, and given it is not intended to encourage consumers to only purchase one thing – the system itself is impartial, and allow the results of the rating to speak for themselves. However, if consumers are unaware that the purpose is only to compare like products, they may be unintentionally misled, and believe a product is more healthy than it actually is.*

*Food selection is important in preventing obesity and lifestyle related diseases, and the Health Star Rating System can assist in this. Choosing foods with high satiety, and ensuring no more energy is consumed than is expended, helps to prevent obesity and related diseases. The Health Star Rating System can assist the consumer in choosing lower energy products, given the energy is stated on the front of the packet, and can be easily compared. Additionally, saturated fats and sugars can be compared and minimised. Finally, the consumer can also easily note the product with the most fibre. Fibre is important as it increases satiety, which reduces the chances of snacking on energy dense foods between meals which can lead to weight gain. Eating products high in energy, saturated fats and sugar can also lead to weight gain and in turn obesity, which overtime can also lead to lifestyle related diseases such as cardiovascular disease and diabetes. Thus, the Health Star Rating System is fairly helpful in assisting consumers to prevent obesity and related diseases.*

*Overall, the Health Star Rating System is limited as it can be manipulated, and only applies to like products, however it is a fairly valid and reliable system that certainly has benefits for consumers in maintaining a healthy weight.*