



## ATAR course examination, 2020

### Question/Answer booklet

# FOOD SCIENCE AND TECHNOLOGY

Please place your student identification label in this box

WA student number: In figures

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In words

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### Time allowed for this paper

Reading time before commencing work: ten minutes

Working time: three hours

### Materials required/recommended for this paper

#### *To be provided by the supervisor*

This Question/Answer booklet

Multiple-choice answer sheet

Number of additional  
answer booklets used  
(if applicable):

#### *To be provided by the candidate*

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course examination

### Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

## Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of examination
Section One Multiple-choice	15	15	15	15	15
Section Two Short answer	8	8	95	68	55
Section Three Extended answer	3	2	70	40	30
<b>Total</b>					100

## Instructions to candidates

1. The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2020: Part II Examinations*. Sitting this examination implies that you agree to abide by these rules.

2. Answer the questions according to the following instructions.

Section One: Answer all questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. Do not use erasable or gel pens. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Sections Two and Three: Write your answers in this Question/Answer booklet.

3. You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question.
4. Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

**Section One: Multiple-choice****15% (15 Marks)**

This section has **15** questions. Answer **all** questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. Do not use erasable or gel pens. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Suggested working time: 15 minutes.

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1. Vegetables that are packaged and prepared ready to use are
  - (a) value-added foods.
  - (b) functional foods.
  - (c) genetically-modified foods.
  - (d) preserved foods.
  
2. Commercial processing of food will always
  - (a) create a line extension.
  - (b) influence the place of sale.
  - (c) alter sensory properties.
  - (d) alter the colour of food.
  
3. New food products are developed because
  - (a) food companies recognise opportunities to increase sales and/or prices.
  - (b) consumers require a greater choice of health foods.
  - (c) consumers require a greater choice of convenience foods.
  - (d) there is a need to reduce unemployment in the food industry.
  
4. Occupational safety and health legislation protects the
  - (a) consumer from food-related allergies and intolerances.
  - (b) health and safety of personnel in the workplace.
  - (c) access of employees to complimentary meals.
  - (d) health and safety of food production and supply systems.
  
5. Product specifications for a new food product refer to the
  - (a) location where the product should be developed.
  - (b) situation in which the product should be developed.
  - (c) quality and demographic that should be applied to the product.
  - (d) quality and standards that should be applied to the product.

**See next page**

6. The technology process used to produce a food product that meets consumer needs includes
- (a) investigate, devise, generate and assess.
  - (b) investigate, devise, produce and evaluate.
  - (c) select, compare, generate and evaluate.
  - (d) select, compare, produce and assess.
7. Promotion is an aspect of the marketing mix that influences
- (a) the availability of adequate quantities for the consumer.
  - (b) the resources available to the consumer.
  - (c) consumer attitudes and purchasing behaviours.
  - (d) financial resources available to the producer.
8. A document that includes information about the consumer, the product and its purpose is known as a
- (a) product proposal.
  - (b) marketing mix.
  - (c) design brief.
  - (d) product analysis.
9. The manipulation of food at a molecular level is known as
- (a) micro-nutrition.
  - (b) genetic modification.
  - (c) micro-encapsulation.
  - (d) nanotechnology.
10. A preservative is added to food to
- (a) make it palatable.
  - (b) extend its life.
  - (c) enhance its texture.
  - (d) modify its viscosity.
11. Food Standards Australia New Zealand (FSANZ) is responsible for
- (a) providing a fair trade framework for the food industry.
  - (b) enforcing the Food Standards Code.
  - (c) inspecting and sampling imported food.
  - (d) coordinating food surveillance and recall systems.

12. Intensive farming practices are characterised by
- (a) higher commodity prices, improved agricultural production methods and the regulated use of chemicals.
  - (b) regulated use of chemicals, increased efficiency and better living conditions for livestock.
  - (c) high crop yields, better living conditions for livestock and higher commodity prices.
  - (d) increased efficiency, improved agricultural production methods and high crop yields.
13. Consumer concerns related to the promotion of certain products through their placement in supermarkets has resulted in some outlets
- (a) adding check-out lanes without confectionery.
  - (b) placing best-selling products at eye level and grouping meal products together.
  - (c) placing flowers at the store entrance to create a fresh image.
  - (d) adding sections at the front of the store for grab-and-go items.
14. According to the Australian Standard metric measurements  $\frac{3}{4}$  of a tablespoon of a liquid can be measured using
- (a)  $1\frac{1}{2}$  teaspoonsful.
  - (b) 2 teaspoonsful.
  - (c) 3 teaspoonsful.
  - (d) 4 teaspoonsful.
15. A large biscuit-making company wants to create snack-sized packets of its most popular product. To use existing equipment, the company intends to use the same initial weight of each box of biscuits. If each original box contains 175 grams of biscuits, and each biscuit weighs seven grams, how many individual packets of biscuits can each box contain?
- (a) four packets with six biscuits in each
  - (b) five packets with four biscuits in each
  - (c) five packets with five biscuits in each
  - (d) six packets with four biscuits in each

**End of Section One**

**See next page**

## Section Two: Short answer

55% (68 Marks)

This section has **eight** questions. Answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 95 minutes.

## Question 16

(9 marks)

You are planning to hold a sausage sizzle at school to raise funds for your favourite charity. You will prepare fried sausages and sliced onion and serve them in hot dog buns, presenting them for immediate consumption on paper napkins. Condiments will include tomato sauce, mustard and sweet chilli sauce. The school has asked you to develop a Hazard Analysis Critical Control Point (HACCP) system.

- (a) Explain the purpose of a HACCP system. (3 marks)

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To develop a HACCP system, all of the steps in the food production process must be considered.

- (b) For each of the steps in the production process shown in the table below, identify **two** actions to consider when creating a HACCP system for the sausage sizzle. (6 marks)

Production process	Actions to consider
Purchase or delivery of food	One: _____ _____ _____ _____

Production process	Actions to consider
Purchase or delivery of food (continued)	Two: _____ _____ _____ _____
Food storage	One: _____ _____ _____ _____ Two: _____ _____ _____ _____
Food preparation	One: _____ _____ _____ _____ Two: _____ _____ _____ _____

Question 17

(9 marks)

- (a) Identify **two** fat-soluble vitamins. For each vitamin, provide a function in the body and a food source. (6 marks)

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- (b) Explain the importance to bone health of exposure to sunlight. (3 marks)

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**Question 18****(8 marks)**

Packaging is an important aspect of the food industry and manufacturers constantly try to make improvements to it. For example, they may modify product packaging to make it more convenient for consumers and reduce the impact on the environment.

- (a) Describe the process of aseptic packaging. Identify **two** benefits of this process.

**(4 marks)**

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- (b) Describe **two** reasons why the demand for food products manufactured using high-pressure processing has increased.

**(4 marks)**

One: \_\_\_\_\_

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Two: \_\_\_\_\_

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## Question 19

(9 marks)

Some people experience physical reactions to particular foods or group of foods that the majority of people tolerate easily. While some of the symptoms may be similar, these two diet-related conditions are very different.

- (a) Explain the difference between a food allergy and a food intolerance. (3 marks)

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- (b) Describe **three** strategies that can be employed to help manage a diagnosis of a food allergy or intolerance. (6 marks)

One: \_\_\_\_\_

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Two: \_\_\_\_\_

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Three: \_\_\_\_\_

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**Question 20****(9 marks)**

(a) Explain the term 'phytochemical'.

**(3 marks)**


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(b) Name **two** phytochemicals. Identify a food source and state the function in the body of each.**(6 marks)**

<b>Phytochemical</b>	<b>Food source</b>	<b>Function in the body</b>
One:		
Two:		



**Question 22****(8 marks)**

Marketing practices must conform to accepted moral principles. Unethical marketing techniques can have a negative impact on children's food preferences.

- (a) Comment on community concern over the potential for the Australian Association of National Advertisers (AANA) Code to regulate the advertising of food and beverage products to children. (2 marks)

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- (b) Describe **three** principles of the AANA food marketing code that the manufacturers should consider when advertising products to children. (6 marks)

One: \_\_\_\_\_

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Two: \_\_\_\_\_

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Three: \_\_\_\_\_

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**Question 23**

**(7 marks)**

- (a) The stomach, liver and large intestine are important components of the human digestive system. Describe the function of each of them in the digestion of food. **(6 marks)**

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- (b) State the purpose of the villi in the digestion of nutrients. **(1 mark)**

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**End of Section Two**

**See next page**

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**See next page**

**Section Three: Extended answer****30% (40 Marks)**

This section contains **three** questions. Answer **two** questions only. Write your answers in the spaces provided following Question 26.

Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 70 minutes.

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**Question 24****(20 marks)**

- (a) Define the term 'biotechnology' as it applies to food production. (2 marks)
- (b) Explain how each of the following examples of biotechnology are applied in food production:
- microorganisms
  - yeasts. (6 marks)

Australians are becoming more concerned about the effect of increased demand for food on the environment. Producers are seeking ways to conserve resources and support more sustainable practices.

- (c) Explain how **three** environmental issues impact sustainable production of food commodities. For each issue identify **one** sustainable farming strategy that could be adopted to reduce the impact on the environment. (12 marks)

**Question 25****(20 marks)**

About 820 million people on Earth are usually hungry, while at the same time there are about 1.5 billion who are overweight or obese. 'Zero hunger' is the second of 17 Sustainable Development Goals adopted by the United Nations in 2015, as part of its 2030 Agenda for Sustainable Development. Globally, enough food is produced for every person on the planet to consume a healthy and nutritious diet, but the global food supply is not equitable.

- (a) Describe **three** influences on the global food supply. (6 marks)
- (b) Identify **three** influences on the distribution of global food resources. For each influence, clarify the effect on the distribution of global food resources. (9 marks)
- (c) Identify **one** strategy that might be adopted to counter the effect of inequitable food supply. Explain why it would be effective. (5 marks)



**Question 26****(20 marks)**

The sensory, physical and chemical properties of food change during preparation, processing, storage and presentation. These changes determine the performance of the ingredients in food products. Food producers select preparation and processing techniques that will enhance the properties of their products.

- (a) Identify **two** functional properties that may have a negative impact on the performance of food products. (2 marks)
- (b) Explain the function in food processing of each of the following natural food components: (6 marks)
- gluten
  - sugar.

Read the recipe below.

**Lemon meringue pie**

Ingredients	Method
<p><b>Pastry:</b>            1½ cups plain flour            125 g butter            ⅓ cup water            2 teaspoons lemon juice</p> <p><b>Lemon filling:</b>            1 heaped tablespoon cornflour            1 cup water            125 g butter            180 g castor sugar            4 egg yolks            3 lemons, grated rind and juice</p> <p><b>Meringue:</b>            4 egg whites            3 tablespoons castor sugar</p>	<ol style="list-style-type: none"> <li>1. Sift flour then rub in butter. Add water and lemon juice and mix to a firm dough.</li> <li>2. Knead gently on lightly-floured surface until smooth. Cover and refrigerate 30 minutes.</li> <li>3. Grease a deep 23 cm pie tin. Roll pastry to line the tin. Lift pastry into pie tin; gently ease pastry into sides. Trim the edges neatly.</li> <li>4. Place pie shell on oven tray for easier handling. Bake blind at 200 °C for 10 minutes.</li> <li>5. Remove paper and blind baking beans, return to the oven and bake for a further 10 minutes at 180 °C. Cool.</li> </ol> <ol style="list-style-type: none"> <li>1. Blend cornflour and water in a saucepan.</li> <li>2. Add butter, sugar, egg yolks, rind and juice of lemons.</li> <li>3. Bring to the boil, stirring until thickened. Cool slightly.</li> <li>4. Pour filling into pie case.</li> </ol> <ol style="list-style-type: none"> <li>1. Beat egg whites stiffly.</li> <li>2. Beat while gradually adding castor sugar.</li> <li>3. Pipe or pile meringue on top of filling.</li> <li>4. Brown lightly at 180 °C for 5 minutes.</li> </ol>

- (c) Identify **three** functional properties of food in the pie recipe. Explain how each determines the performance of the ingredients in the pie. (12 marks)

**End of questions**































## ACKNOWLEDGEMENTS

### Question 25

First sentence from: Fraser, E., & Fraser, E. (2014). *10 things you need to know about the global food system*. Retrieved June, 2020, from <https://www.theguardian.com/sustainable-business/food-blog/10-things-need-to-know-global-food-system>

Second sentence Adapted from: Benners-Lee, M., Kennelly, C., Watson, R., et al. (2018). *Current global food production is sufficient to meet human nutritional needs in 2050 provided there is radical societal adaptation*. Retrieved June, 2020, from <https://www.elementascience.org/articles/10.1525/elementa.310/print/#B45>

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Third sentence adapted from: Fraser, E., & Fraser, E. (2014). *10 things you need to know about the global food system*. Retrieved June, 2020, from <https://www.theguardian.com/sustainable-business/food-blog/10-things-need-to-know-global-food-system>

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