GCE

Rewarding Learning

CCEA GCE Specimen Assessment Material for

Nutrition and Food Science

For first teaching from September 2016
For first award of AS level in Summer 2017
For first award of A level in Summer 2018
Subject Code: 3310

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Foreword

CCEA has developed new specifications which comply with criteria for GCE qualifications. The specimen assessment materials accompanying new specifications are provided to give centres guidance on the structure and character of the planned assessments in advance of the first assessment. It is intended that the specimen assessment materials contained in this booklet will help teachers and students to understand, as fully as possible, the markers' expectations of candidates' responses to the types of tasks and questions set at GCE level. These specimen assessment materials should be used in conjunction with CCEA's GCE Nutrition and Food Science specification.

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GCE Nutrition and Food Science
Specimen Assessment Materials

Contents

Subject Code	3310
QAN	601/8370/6 601/8371/8

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SPECIMEN PAPERS

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Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017

Centre Number

Candidate Number

Nutrition and Food Science

Assessment Unit AS 1

assessing

Principles of Nutrition

[CODE]

SPECIMEN PAPER

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Answer **all** questions in Section A and **two** questions from Section B.
Write your answers to Section A in the Question Paper.
Write your answers to Section B in the Answer Booklet provided.
Use the treasury tag provided to attach your Answer Booklet to the Question Paper at the end of the examination.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Quality of written communication will be assessed in Questions 6–8.
Figures in brackets printed down the right side of pages indicate the marks awarded to each question or part question.

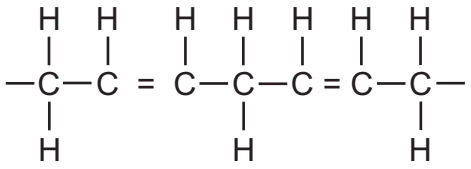
For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
Total Marks	

Section A

Answer **all** questions in this section in the spaces provided.

Examiner Only	
Marks	Re-mark

1 **(a)** **(i)** Identify the type of fatty acid below.



_____ [1]

(ii) Name **one** food source of this type of fatty acid.

_____ [1]

(b) Explain why omega–3 and omega–6 long chain polyunsaturated fatty acids are important during infancy.

_____

_____

_____

_____ [2]

(c) Consider the health implications for adults of the information below.

	Dietary Reference Value	Current average intake in adults
Saturated fatty acids	11% of food energy	12.8% in men 12.6% in women

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[5]

2 **(a)** Explain how carbohydrate in the diet has a protein sparing effect.

[3]

(b) Identify **two** vitamins needed for the metabolism of carbohydrate.

[2]

Examiner Only	
Marks	Re-mark

(c) Using the information in the table below, justify the decision to choose wholemeal bread over white bread.

Per 100g	Energy value(Kcal/KJ)	Carbohydrate (g)	Sugars (g)	Starch (g)	NSP (g)
Wholemeal bread	217/922	42.0	2.8	39.3	5.0
White bread	219/931	46.1	3.4	42.7	1.9

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[5]

(d) Complete the following table with the Dietary Reference Values (DRVs) for carbohydrate and fat as a percentage of energy intake.

	DRVs, % of daily total energy intake (including alcohol)
Total carbohydrate:	47
– of which non-milk extrinsic sugars	_____
Total fat:	33
– of which saturated fatty acids	_____
– of which trans fatty acids	_____

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[3]

Examiner Only	
Marks	Re-mark

Examiner Only	
Marks	Re-mark

(e) *The National Diet and Nutrition Survey of UK Adults (2014)* found that the intake of non-milk extrinsic sugar (NMES) exceeded the dietary reference value in all age groups and was highest in children.

Assess the impact of this finding on the oral health of children.

[5]

3 **(a)** Explain the consequences of too much vitamin A in the diet.

[5]

(b) Outline the antioxidant role of vitamin E.

[3]

(c) Explain the term bioavailability in relation to vitamins and minerals.

[4]

(d) Explain why vitamin D supplements are recommended during pregnancy.

Examiner Only	
Marks	Re-mark

Examiner Only	
Marks	Re-mark

[5]

4 **(a)** Discuss **one** factor that impacts on hydration.

[3]

(b) Suggest a reason why selenium is important in the diet of an adult man.

[2]

(c) Give **two** reasons why women of child-bearing age are at risk of iron deficiency anaemia.

[2]

5 Compare and contrast Quorn and red meat in relation to nutrition and health.

[5]

Examiner Only	
Marks	Re-mark

Section B

Quality of written communication is assessed in this section.

Answer **two** questions from this section.

Write your answers in the Answer Booklet provided.

6 Discuss the specific nutritional requirements of teenagers. [12]

7 Examine the risk factors and consequences of dehydration in older adults. [12]

8 Explain the importance of calcium and folate for adult women. Support your answer with relevant food sources for each nutrient. [12]

Examiner Only	
Marks	Re-mark

THIS IS THE END OF THE QUESTION PAPER

Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017

Centre Number

Candidate Number

Nutrition and Food Science

Assessment Unit AS 2

assessing

Diet, Lifestyle and Health

[CODE]

SPECIMEN PAPER

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Answer **all** questions in Section A and **three** questions from Section B.
Write your answers to Section A in the Question Paper.
Write your answers to Section B in the Answer Booklet provided.
Use the treasury tag provided to attach your Answer Booklet to the Question Paper at the end of the examination.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Quality of written communication will be assessed in Questions 5–8.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
Total Marks	

Section A

Answer **all** questions in this section in the spaces provided.

Examiner Only	
Marks	Re-mark

1 (a) (i) Using the information in the table below, suggest why boys have slightly higher requirements for energy than girls.

Estimated Average Requirements (EARs) for Energy

Age	Boys' EARs MJ/(kcal)/day	Girls' EARs MJ/(kcal)/day
4–6 years	7.16 (1715)	6.46 (1545)
7–10 years	8.24 (1970)	7.28 (1740)
15–18 years	11.5 (2755)	8.83 (2110)

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_____

_____

_____

_____ [2]

(ii) Explain why there is an upward trend in energy requirements.

_____

_____

_____

_____ [2]

(b) (i) Circle the correct body mass index (BMI) scale for a healthy weight range.

18.5–24.9

25–29.9

30–34.9 [1]

(ii) State **one** other way overweight and obesity can be measured.

_____ [1]

(c) Describe the changes in energy balance which contribute to weight gain.

Examiner Only	
Marks	Re-mark

[3]

2 **(a)** Describe the possible impact of alcohol intake on the health of adult men.

[5]

(b) Explain the risks to the baby of alcohol consumption in pregnancy.

[4]

Examiner Only	
Marks	Re-mark

Examiner Only	
Marks	Re-mark

3 **(a)** Identify **two** symptoms of Type 2 diabetes.

[2]

(b) Explain how an understanding of glycaemic index could help an individual manage Type 2 diabetes.

[5]

4 **(a)** Explain the role of homocysteine as a risk factor for cardiovascular disease.

[4]

(b) The consumption of oily fish reduces the risk of cardiovascular disease. Comment on this advice.

[3]

(c) Explain why eating fewer fast foods could reduce the risk of breast cancer.

[3]

Examiner Only	
Marks	Re-mark

Section B

Quality of written communication is assessed in this section.

Answer **three** questions from this section.

Write your answers in the Answer Booklet provided.

Examiner Only	
Marks	Re-mark

5 Propose and justify dietary and lifestyle recommendations to achieve a healthy weight in childhood. [15]

6 Explain how the following food choices can increase cancer risk:

- high salt diet
- low fruit and vegetable intake
- eating meat daily. [15]

7 Describe the development of cardiovascular disease. Explain how smoking and excessive alcohol intakes are involved in the development of the disease. [15]

8 Discuss the potential health benefits of regular physical activity for adults. [15]

THIS IS THE END OF THE QUESTION PAPER

Rewarding Learning

ADVANCED
General Certificate of Education
2018

Nutrition and Food Science

Assessment Unit A2 1

assessing

Option A: Food Security and Sustainability
or
Option B: Food Safety and Quality

[CODE]

SPECIMEN PAPER

TIME

2 hours 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number on the Answer Booklet provided.

Choose either Option A or Option B.

Option A: Food Security and Sustainability.
Answer the **one** question in Section A and **three** questions from Section B.

Option B: Food Safety and Quality.
Answer the **one** question in Section A and **three** questions from Section B.

INFORMATION FOR CANDIDATES

The total mark for this paper is 85.
Quality of written communication will be assessed in **all** questions.
Figures in brackets printed down the right side of pages indicate the marks awarded to each question or part question.

Option A: Food Security and Sustainability

Quality of written communication will be assessed in all questions.

Section A

Answer the **one** question in this section.

1 **(a)** Outline the arguments that could be used to convince consumers to buy Fairtrade certified products. [10]

(b) Explain how the following assurance schemes assist consumers who want to make environmental and ethical food choices:
- LEAF
- Rainforest Alliance
- Marine Stewardship Council. [15]

Section B

Answer **three** questions from this section.

2 Examine the role of the consumer as a contributor to the problem of food and associated packaging waste. [20]

3 Consider the social and environmental cost of shopping for food in supermarkets. [20]

4 Discuss the barriers that prevent consumers from making sustainable food choices. [20]

5 Argue the ethical and environmental merits of the following advice from Sustain:
- buy local, seasonally available ingredients
- buy food from farming systems that minimise harm to the environment such as certified organic produce. [20]

Option B: Food Safety and Quality

Quality of written communication will be assessed in all questions.

Section A

Answer the **one** question in this section.

1 **(a)** Explain how consumers can avoid food poisoning from *Campylobacter*. [10]

(b) Describe the work carried out by the Environmental Health Practitioner (EHP) to reduce the possibility of food poisoning for consumers. [15]

Section B

Answer **three** questions from this section.

2 Explore the controversy surrounding the use of additives in food. [20]

3 Explain the work of the Food Standards Agency (FSA) and the Department of Agriculture and Rural Development (DARD) in relation to food safety. [20]

4 Discuss the reasons why food allergies are increasing and outline the current food allergen labelling and information regulations. [20]

5 Describe the possible risks to public health of each of the following chemical contaminants:

- dioxins
- heavy metals such as mercury, lead and cadmium
- Bisphenol-A (BPA). [20]

THIS IS THE END OF THE QUESTION PAPER

MARK SCHEME

DIVIDER FRONT

MARK SCHEME

DIVIDER BACK

Rewarding Learning

General Certificate of Education

Nutrition and Food Science

GENERAL MARKING INSTRUCTIONS

General Marking Instructions

Introduction
The main purpose of the mark scheme is to ensure that examinations are marked accurately, consistently and fairly. The mark scheme provides examiners with an indication of the nature and range of candidates' responses likely to be worthy of credit. It also sets out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives
Below are the assessment objectives for Nutrition and Food Science.

Candidates should be able to demonstrate:

AO1 knowledge and understanding of the specified content

AO2 the ability to apply knowledge, understanding and skills in a variety of situations and to analyse problems, issues and situations using appropriate skills

AO3 the ability to gather, organise and select information, evaluate acquired knowledge and understanding, and present and justify an argument

Quality of candidates' responses
In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity that may reasonably be expected of a 17 or 18-year-old, the age at which the majority of candidates sit their GCE examinations.

Flexibility in marking
Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking
Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17 or 18-year-old GCE candidate.

Awarding zero marks
Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Types of mark schemes
Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

Levels of response
In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement.

The following guidance is provided to assist examiners.

- ***Threshold performance:*** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- ***Intermediate performance:*** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- ***High performance:*** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

Quality of written communication
Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level 1: Quality of written communication is basic.
Level 2: Quality of written communication is adequate.
Level 3: Quality of written communication is competent.
Level 4: Quality of written communication is highly competent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

Level 1 (Basic): The candidate makes only a limited attempt to select and use an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that the intended meaning is not clear.

Level 2 (Adequate): The candidate makes a reasonable attempt to select and use an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

Level 3 (Competent): The candidate makes a good attempt to select and use an appropriate form and style of writing. Relevant material is organised with a good degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

Level 4 (Highly competent): The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is succinct, well organised and displays a high degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear.

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Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017

Nutrition and Food Science

Assessment Unit AS 1

assessing

Principles of Nutrition

[CODE]

SPECIMEN

MARK SCHEME

Section A

AVAILABLE MARKS

1 (a) (i) Identify the type of fatty acid below. (AO1)

- polyunsaturated fatty acid [1]

(ii) Name **one** food source of this type of fatty acid. (AO1)

- vegetable oils, e.g. corn, sunflower, soya bean
- nuts, except coconut and cashew
- soft margarine, e.g. soya and sunflower
- oily fish

All other valid points will be given credit. [1]

(b) Explain why omega-3 and omega-6 long chain polyunsaturated fatty acids are important during infancy. (AO1, AO2)

- brain and retina development: major brain growth occurs throughout the first two years of life. During these times, infants have the greatest need for omega-3 and omega-6.

All other valid points will be given credit.
[1] basic explanation
[2] competent explanation [2]

(c) Consider the health implications for adults of the information below. (AO1, AO2, AO3)

	Dietary Reference Value	**Current average intake in adults**
Saturated fatty acids	11% of food energy	12.8% in men 12.6% in women

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- the current average intake of saturated fatty acids in adults is above the recommended dietary reference value (DRV)
- blood cholesterol: saturated fat is the dietary component with the greatest negative influence on total blood cholesterol and LDL cholesterol levels
- heart disease: high levels of cholesterol can increase risk of heart disease such as, heart attack, stroke and atherosclerosis

All other valid points will be given credit.
[1–2] basic consideration of data
[3–4] competent consideration of data
[5] highly competent consideration of data [5]

9

AVAILABLE MARKS

2 **(a)** Explain how carbohydrate in the diet has a protein sparing effect. (AO1, AO2)

- glucose: the body's tissues require a constant supply of glucose, the main source being dietary carbohydrate but it can also be synthesised from protein
- protein: if the diet is low in carbohydrate, a greater percentage of dietary protein is used to provide glucose, which means less is available for the growth and repair of body tissues

All other valid points will be given credit.
[1] basic explanation
[2] competent explanation
[3] highly competent explanation [3]

(b) Identify **two** vitamins needed for the metabolism of carbohydrate. (AO1, AO2)

- vitamin B_1 - thiamine
- vitamin B_2 - riboflavin
- niacin
- vitamin B_{12}

All other valid points will be given credit.
[1] for each correctly identified vitamin [2]

(c) Using the information in the table below, justify the decision to choose wholemeal bread over white bread. (AO1, AO2, AO3)

Per 100g	Energy value (Kcal/KJ)	Carbohydrate (g)	Sugars (g)	Starch (g)	NSP (g)
Wholemeal bread	217/922	42.0	2.8	39.3	5.0
White bread	219/931	46.1	3.4	42.7	1.9

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- non-starch polysaccharides (NSP): both breads contain complex carbohydrates in the form of starch but wholemeal bread provides more NSP
- health benefits: NSP has many health benefits such as, improved dental health, reduced risks of bowel disorders, cancer, gallstones, and aids diabetes management
- satiety: wholemeal bread will have a higher satiety value due to NSP and this helps maintain a healthy weight
- dental caries: wholemeal bread has less sugar resulting in less risk of dental caries

All other valid points will be given credit.
[1–2] basic justification
[3–4] competent justification
[5] highly competent justification [5]

(d) Complete the following table for Dietary Reference Values (DRVs) for carbohydrate and fat as a percentage of energy intake. (AO1, AO2)

AVAILABLE MARKS

	DRVs, % of daily total energy intake (including alcohol)
Total carbohydrate:	47
– of which non-milk extrinsic sugars	10
Total fat:	33
– of which saturated fatty acids	10
– of which trans fatty acids	2

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[1] for each correct DRV [3]

(e) *The National Diet and Nutrition Survey of UK Adults 2014* found that the intake of non-milk extrinsic sugar (NMES) exceeded the dietary reference value in all age groups and was highest in children.

Assess the impact of this finding on the oral health of children. (AO1, AO2, AO3)

- acid: dietary sugars provide a substrate for the multiplication of oral bacteria and the production of acid
- demineralisation: the acid erodes the enamel, leading to demineralisation
- frequency: if sugar is consumed at frequent intervals, the development of dental caries is increased because the pH (acid) level remains high
- children: tooth decay occurs more quickly in children, their teeth are small and decay reaches the nerve of a tooth very quickly

All other valid points will be given credit.
[1–2] basic assessment
[3–4] competent assessment
[5] highly competent assessment [5]

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AVAILABLE MARKS

3 **(a)** Explain the consequences of too much vitamin A in the diet. (AO1, AO2)

- hypervitaminosis A: can cause drowsiness, irritability, hair loss and double vision
- liver damage
- birth defects: high intakes of vitamin A in pregnancy can lead to birth defects
- skin and bone disorders

All other valid points will be given credit.
[1–2] basic explanation
[3–4] competent explanation
[5] highly competent explanation [5]

(b) Outline the antioxidant role of vitamin E. (AO1)

- lipid protection: vitamin E protects lipids, especially polyunsaturated fatty acids against free radical damage
- inflammation: prevents lipid peroxidation which can lead to inflammatory diseases
- cancer: can protect against some forms of cancer

All other valid points will be given credit.
[1–2] basic outline
[3] competent outline [3]

(c) Explain the term bioavailability in relation to vitamins and minerals. (AO1, AO2)

- bioavailability: indicates how readily a vitamin or mineral can be absorbed and used by the body
- needs: bioavailability may be influenced by the individual's needs, their ability to absorb nutrients or the amount available to them
- absorption: other components of the diet can affect bioavailability, e.g. vitamin C can enhance the absorption of non-haem iron
- sources: milk, yogurt and other dairy foods are good providers of calcium because they contain significant amounts of calcium in a bioavailable form

All other valid points will be given credit.
[1–2] basic explanation
[3] competent explanation
[4] highly competent explanation [4]

(d) Explain why vitamin D supplements are recommended during pregnancy. (AO1, AO2)

- bones and teeth: vitamin D regulates the amount of calcium and phosphate in the body needed to keep bones and teeth healthy
- supplements: it is recommended that all women should receive supplementary vitamin D to achieve 10 micrograms per day
- stores: the mother provides a store of vitamin D for the foetus during pregnancy that will supply the baby for the first few months of life
- sunlight: particularly important for women who receive little sunlight exposure and also for vegans who eat a limited range of foods containing vitamin D

All other valid points will be given credit.
[1–2] basic explanation
[3–4] competent explanation
[5] highly competent explanation [5]

AVAILABLE MARKS

17

4 **(a)** Discuss **one** factor that impacts on hydration. (AO1, AO2)

Examples of suitable points to be discussed by the candidate:

- caffeine: is a mild diuretic but drinks which contain caffeine (coffee, tea, chocolate, cola and energy drinks) may still contribute to fluid intake under normal circumstances
- physical activity: the body loses water as sweat, especially when it is hot/humid or when taking part in strenuous exercise
- alcohol: is a diuretic and therefore increases the loss of urine from the body; this depends on the amount of fluid ingested with the alcohol, e.g. spirits which are stronger drinks, taken in a smaller volume, have a greater potential to dehydrate than beers which have a higher water content

All other valid points will be given credit.
[1] basic discussion
[2] competent discussion
[3] highly competent discussion [3]

(b) Suggest a reason why selenium is important in the diet of an adult man. (AO1, AO2)

- fertility: recent research has indicated improvements in sperm motility after selenium supplementation in men

All other valid points will be given credit
[1] response correct but not specific to men
[2] response is specific to adult man [2]

		AVAILABLE MARKS
(c)	Give **two** reasons why women of child-bearing age are at risk of iron deficiency anaemia. (AO1, AO2) • menstruation: blood loss from menstruation • pregnancy: increased blood supply demands during pregnancy • inhibiting factor: excess consumption of foods inhibiting iron absorption, e.g. tea and coffee All other valid points will be given credit. [1] for each reason. [2]	7
5	Compare and contrast Quorn and red meat in relation to nutrition and health. (AO1, AO2, AO3) • high quality protein: both Quorn and red meat are sources of high quality protein containing all indispensable amino acids • cholesterol: unlike red meat Quorn is free from cholesterol and low in saturated fat therefore lowers risk in developing cardiovascular disease • NSP: Quorn is a significant source whereas red meat does not contain NSP • energy: Quorn contains fewer calories than red meat • iron: Quorn contains less dietary iron than red meat which contains valuable haem iron All other valid points will be given credit. [1–2] basic comparison [3–4] competent comparison and contrast [5] highly competent comparison and contrast [5]	5

Section B

AVAILABLE MARKS

6 Discuss the specific nutritional requirements of teenagers.
(AO1, AO2, AO3)

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of specific nutritional requirements of teenagers
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the specific nutritional requirements of teenagers
- quality of written communication is basic

Mark Band 2 ([4]–[6])
Overall impression: adequate
- adequate knowledge and understanding of specific nutritional requirements of teenagers
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the specific nutritional requirements of teenagers
- quality of written communication is adequate

Mark Band 3 ([7]–[9])
Overall impression: competent
- good knowledge and understanding of specific nutritional requirements of teenagers
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss the specific nutritional requirements of teenagers
- quality of written communications is competent

Mark Band 4 ([10]–[12])
Overall impression: highly competent
- clear knowledge and understanding of specific nutritional requirements of teenagers
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the specific nutritional requirements of teenagers
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be discussed by the candidate:

AVAILABLE MARKS

- energy: adequate energy important as low energy diet could limit growth during teenage years, energy is important for the rapid growth spurt and synthesis of new tissue

- protein: necessary for muscle development and growth spurt

- calcium: needed for skeletal growth; bone assimilates most of its minerals at this stage and achieves most of its final mass; poor bone mass and failure to consume adequate calcium could lead to peak bone mass not being achieved and subsequently greater risk of osteoporosis later in life

- iron: both boys and girls have an increased requirement for iron due to the relatively large blood volume during periods of rapid growth, the onset of menstruation represents a further stress in the iron status of adolescent girls; there is also evidence to suggest that borderline iron levels can have adverse effects on cognitive function, which could have implications in terms of learning ability and academic performance

- vitamin D: required for the efficient absorption of calcium, which in turn is required for bone development; there is some concern that some teenagers are not getting enough exposure to sunlight to achieve adequate vitamin D

- zinc: needed for normal growth and sexual development, this mineral is also associated with boosting the immune system

All other valid points will be given credit. [12] 12

7 Examine the risk factors and consequences of dehydration in older adults. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of dehydration in older adults
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to examine the risk factors and consequences of dehydration in older adults
- quality of written communication is basic

Mark Band 2 ([4]–[6])
Overall impression: adequate
- adequate knowledge and understanding of dehydration in older adults
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to examine the risk factors and consequences of dehydration in older adults
- quality of written communication is adequate

Mark Band 3 ([7]–[9])
Overall impression: competent
- competent knowledge and understanding of dehydration in older adults
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to examine the risk factors and consequences of dehydration in older adults
- quality of written communication is competent

Mark Band 4 ([10]–[12])
Overall impression: highly competent.
- clear knowledge and understanding of dehydration in older adults
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to examine the risk factors and consequences of dehydration in older adults
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be examined by the candidate:

AVAILABLE MARKS

- risk factors in older people
  - reduced sense of thirst: easy for dehydration to go undetected and lead to mineral imbalance and confusion
  - reduced renal function: kidneys play a vital role in fluid regulation but their function deteriorates with age, the hormonal response to dehydration may be impaired
  - cognitive impairment: can lead to communication problems, which may be more pronounced in those with Alzheimer's disease or who have suffered a stroke
  - medication: dehydration may be exacerbated by medications including diuretics, laxatives and multiple medications

- consequences of dehydration
  - poor health outcomes: increased hospitalisation and mortality; two-fold increase in the mortality of stroke patients; urinary tract and kidney infections; constipation; kidney stones and poor oral health
  - impaired mental performance: mental functions affected include memory, attention, concentration and reaction time
  - low blood pressure: leads to weakness, dizziness and increased risk of falls

All other valid points will be given credit. [12] 12

8 Explain the importance of calcium and folate for adult women.
Support your answer with relevant food sources for each nutrient.
(AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of calcium and folate and sources
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the importance of calcium and folate for adult women
- quality of written communication is basic

Mark Band 2 ([4]–[6])
Overall impression: adequate
- adequate knowledge and understanding of calcium and folate and sources
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain the importance of calcium and folate for adult women
- quality of written communication is adequate

Mark Band 3 ([7]–[9])
Overall impression: competent
- competent knowledge and understanding of calcium and folate and sources
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain the importance of calcium and folate for adult women
- quality of written communication is competent

Mark Band 4 ([10]–[12])
Overall impression: highly competent
- clear knowledge and understanding of calcium and folate and sources
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain the importance of calcium and folate for adult women
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be explained by the candidate:

AVAILABLE MARKS

- calcium
  - improve bone health: after the age of 35 both men and women start losing calcium from their bones; during menopause the rate of loss increases rapidly for women due to decreased oestrogen production, vital therefore that calcium levels are sufficient during this period if women are to avoid major skeletal problems
  - reduce pre-menstrual tension (PMT): several recent studies have shown a link between increased calcium intake and reduced levels of pre-menstrual symptoms
  - regulate blood pressure: some adult women are advised to take calcium supplements during pregnancy if they are at risk of hypertension

    Sources: milk and milk products, white flour, fish where bones are consumed, green leafy vegetables, cereals, fortified soya and tofu products

- folate
  - prevent neural tube defects in pregnancy: it is recommended that all women of childbearing age, especially those planning a pregnancy or who are in the early stages of pregnancy, take a daily supplement of 0.4mg folic acid as it is difficult to achieve this amount of additional folate by diet alone
  - reduce risk of CVD: together with vitamins B_6 and B_{12}, folate is involved with the maintenance of normal blood homocysteine levels; raised blood homocysteine may be a risk factor for developing heart disease and stroke

    Sources: potatoes, green leafy vegetables (spinach, Brussels sprouts, broccoli), fortified breakfast cereals, bread, liver and orange juice

All other valid points will be given credit. [12] 12

Total Marks **80**

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Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017

Nutrition and Food Science

Assessment Unit AS 2

assessing

Diet, Lifestyle and Health

[CODE]

SPECIMEN

MARK SCHEME

Section A

AVAILABLE MARKS

1 (a) (i) Using the information in the table below, suggest why boys have slightly higher requirements for energy than girls. (AO1, AO2)

- boys have greater muscle mass
- differences in body size and weight
- girls have more adipose tissue which is metabolically less active than lean tissue

All other valid points will be given credit.
[1] for each correct suggestion [2]

(ii) Explain why there is an upward trend in energy requirements. (AO1, AO2)

- energy requirements increase as weight increases
- supports rapid growth spurt
- supports the development of pubertal changes

All other valid points will be given credit.
[1] basic explanation
[2] competent explanation [2]

(b) (i) Circle the correct body mass index (BMI) scale for a healthy weight range. (AO1)

- 18.5–24.9 [1]

(ii) State **one** other way overweight and obesity can be measured. (AO1)

- waist to hip ratio
- body fat measurement using body composition scales

All other valid points will be given credit. [1]

(c) Describe the changes in energy balance which contribute to weight gain. (AO1, AO2)

- positive energy balance
- failure to compensate for an increase in energy intake with an increase in expenditure will result in weight gain

All other valid points will be given credit.
[1] basic description
[2] competent description
[3] highly competent description [3] 9

2 (a) Describe the possible impact of alcohol intake on the health of adult men. (AO1, AO2, AO3)

- alcohol consumption increases LDL, hypertension and risk of cardiovascular disease
- increased calorie consumption: 7kcal/g, increases the risk of weight gain and obesity and Type 2 diabetes
- reduced testosterone and fertility levels

All other valid points will be given credit.
[1–2] basic description
[3–4] competent description
[5] highly competent description [5]

			AVAILABLE MARKS
	(b) Explain the risks to the baby of alcohol consumption in pregnancy. (AO1, AO2) • miscarriage • still birth • premature birth • low birth weight • foetal alcohol syndrome (FAS) • high blood pressure All other valid points will be given credit. [1–2] basic explanation [3] competent explanation [4] highly competent explanation	[4]	9
3	**(a)** Identify **two** symptoms of Type 2 diabetes. (AO1) Any **two** symptoms from the following: • unexplained weight loss • blurred vision • genital thrush/itching • frequent urination (polyuria) • increased thirst (polydipsia) • fatigue • slow healing of wounds and cuts • feeling of hunger shortly after eating (polyphagia) All other valid points will be given credit. [1] mark for correctly identifying each symptom	[2]	
	(b) Explain how an understanding of glycaemic index could help an individual manage Type 2 diabetes. (AO1, AO2, AO3) • low GI foods: absorbed more slowly, helps regulate blood sugar levels and helps to control post-meal highs and lows • high GI foods: absorbed more quickly, blood glucose rises sharply causing spikes in blood sugar • part of a balanced diet: should not be focused on exclusively eating only low GI foods; may lead to a diet high in fat and calories, resulting in weight gain and increasing the risk of cardiovascular disease (CVD); the presence of fat, protein and insoluble non-starch polysacharide lowers the GI value as does the cooking method, ripeness and processing All other valid points will be given credit. [1–2] basic explanation [3–4] competent explanation [5] highly competent explanation	[5]	7

		AVAILABLE MARKS
4	**(a)** Explain the role of homocysteine as a risk factor for cardiovascular disease. (AO1, AO2) • damage to arteries: high levels of the amino acid homocysteine damages the lining of the arteries, cholesterol builds up which can cause blockages • excessive homocysteine not removed: folate and the B complex vitamins are needed to make the enzymes that remove homocysteine from the body. If there is a low intake of folate, excess homocysteine is not removed thus increasing the risk of CVD • risk of clotting: homocysteine changes the coagulation factor levels which encourages thrombosis All other valid points will be given credit. [1–2] basic explanation [3] competent explanation [4] highly competent explanation [4]	
	(b) The consumption of oily fish reduces the risk of cardiovascular disease. Comment on this advice. (AO1, AO2) • source of omega-3 (EPA & DHA): present in oily fish; reduces blood pressure, reduces the tendency of blood to clot, regulates the heart rhythm, reduces triglyceride levels • rich in vitamin A: antioxidant properties protect heart cells from damage caused by free radicals • low in calories and less saturated fat All other valid points will be given credit. [1] basic comment [2] competent comment [3] highly competent comment [3]	
	(c) Explain why eating fewer fast foods could reduce the risk of breast cancer. (AO1, AO2) • higher calorie content: providing extra energy and potentially weight gain, overweight women are at greater risk of breast cancer. Fat cells are thought to make oestrogen which can cause extra breast cell growth and increase the risk of breast cancer • low NSP of fast-foods: diets high in NSP have been found to lower the levels of oestrogen in the blood; high levels of oestrogen may increase the risk of breast cancer • diets low in fruit and vegetables have lower antioxidant levels, phytoestrogens and flavonols All other valid points will be given credit. [1] basic explanation [2] competent explanation [3] highly competent explanation [3]	10

Section B

AVAILABLE MARKS

5 Propose and justify dietary and lifestyle recommendations to achieve a healthy weight in childhood. (AO1, AO2, AO3)

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in childhood
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to propose and justify dietary and lifestyle recommendations to achieve a healthy weight in childhood
- quality of written communication is basic

Mark Band 2 ([4]–[7])
Overall impression: adequate
- adequate knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in childhood
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to propose and justify dietary and lifestyle recommendations to achieve a healthy weight in childhood
- quality of written communication is adequate

Mark Band 3 ([8]–[11])
Overall impression: competent
- competent knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in childhood
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to propose and justify dietary and lifestyle recommendations to achieve a healthy weight in childhood
- quality of written communication is competent

Mark Band 4 ([12]–[15])
Overall impression: highly competent
- clear knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in childhood
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to propose and justify dietary and lifestyle recommendations to achieve a healthy weight in childhood
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be proposed and justified by the candidate:

AVAILABLE MARKS

- dietary recommendations
  - maintain energy balance: energy input should equal energy output; diets low in energy may limit growth; diets that are energy dense may lead to weight gain and obesity
  - maintain a healthy well-balanced diet: follow healthy eating advice; five or more portions of a variety of fruit and vegetables, meals that are based on wholegrain starchy foods, lower fat dairy products (once children are over five), limit foods high in fat and/or sugar; diets which are not well-balanced will increase energy intake and lead to weight gain and obesity
  - control of high fat, high sugar snacks (fast food, biscuits, chocolate, crisps): high fat and high sugar foods are energy dense and may increase the potential for weight gain and obesity, replace high sugar drinks with water
  - portion control: children need help to be able to recognise when they are hungry and when they are full; there is some evidence that very young children (under 2 years) will eat what they need and no more (whatever size portion they are given), older children may eat more than they need when given a larger portion
  - discourage grazing: meal times allow the provision of a healthy well-balanced diet; grazing on high fat, high sugar foods provides empty calories and may displace a healthy, well-balanced meal

- lifestyle recommendations
  - increased physical activity: aim to achieve 60 minutes of moderate physical activity per day to help achieve energy balance in children
  - limiting sedentary behaviour (television viewing, use of electronic devices): many studies have found a clear association between watching television and an increased risk of obesity; sedentary behaviour may lead to the conversion of energy into fat and television viewing is linked with increased snacking
  - adequate sleep provision: studies have found that a lack of sleep is associated with weight gain as it can cause changes in hormones and metabolism which may increase the risk of obesity

All other valid points will be given credit. [15]

15

6 Explain how the following food choices can increase cancer risk:
- high salt diet
- low fruit and vegetable intake
- eating meat daily. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of how the listed food choices can increase cancer risk
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how these food choices can increase cancer risk
- quality of written communication is basic

Mark Band 2 ([4]–[7])
Overall impression: adequate
- adequate knowledge and understanding of how the listed food choices can increase cancer risk
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how these listed food choices can increase cancer risk
- quality of written communication is adequate

Mark Band 3 ([8]–[11])
Overall impression: competent
- competent knowledge and understanding of how the listed food choices can increase cancer risk
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how these listed food choices can increase cancer risk
- quality of written communication is competent

Mark Band 4 ([12]–[15])
Overall impression: highly competent
- clear knowledge and understanding of how the listed food choices can increase cancer risk
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how these listed food choices can increase cancer risk
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be explained by the candidate:

AVAILABLE MARKS

- high salt diet
  - salt has been suggested as a causative factor in stomach cancer. High osmotic activity is linked to gastritis resulting in early damage to the mucosa and acts as a gastric irritant. This leads to degeneration of the acid-secreting glands in the stomach and to an increase in the acid secreting bacteria which produce carcinogenic substances known as nitrosamines

- low fruit and vegetable intake
  - low levels of fruit and vegetables limits the inclusion of antioxidants within the diet which have the capacity to scavenge free radicals. Oxygen free radicals can react with DNA to cause breaks in the DNA chain and mutation; this could initiate carcinogenesis
  - low levels of fruit and vegetables may limit the inclusion of NSP: low levels of NSP may promote colon cancer as NSP is required to increase bulk and therefore faster transit time through the colon; a lack of NSP causes potentially harmful carcinogenic substances to be present in a more concentrated form which ultimately may be in contact with the colonic mucosa for a longer time
  - low levels of fruit and vegetables may also indicate a less healthy diet with a higher fat content which can increase the risk of breast cancer as a result of weight gain and enhanced hormone levels

- eating meat daily
  - research suggests eating red meat in particular is linked with DNA damage which raises the risk of bowel cancer
  - meat contains higher levels of saturated fat than many non-meat alternatives which can increase the risk of obesity and weight gain, leading to breast cancer probably due to the associated increase in hormones
  - a high fat diet can increase the secretion of bile acids which can form mutagenic compounds leading to an increased risk of breast, colon and prostate cancers
  - red meat can also contribute to the promotion of colon cancer due to N-nitrosocompounds
  - processed meats are thought to cause colon and stomach cancer due to the addition of nitrates

All other valid points will be given credit. [15] 15

7 Describe the development of cardiovascular disease. Explain how smoking and excessive alcohol intakes are involved in the development of the disease. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of the development of cardiovascular disease
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe the development of cardiovascular disease
- demonstrates a limited ability to explain how smoking and excessive alcohol intake are involved in the development of cardiovascular disease
- quality of written communication is basic

Mark Band 2 ([4]–[7])
Overall impression: adequate
- adequate knowledge and understanding of the development of cardiovascular disease
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe the development of cardiovascular disease
- demonstrates an adequate ability to explain how smoking and excessive alcohol intake are involved in the development of cardiovascular disease
- quality of written communication is adequate

Mark Band 3 ([8]–[11])
Overall impression: competent
- competent knowledge and understanding of the development of cardiovascular disease
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe the development of cardiovascular disease
- demonstrates a competent ability to explain how smoking and excessive alcohol intake are involved in the development of cardiovascular disease
- quality of written communication is competent

Mark Band 4 ([12]–[15])
Overall impression: highly competent
- clear knowledge and understanding of the development of cardiovascular disease
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe the development of cardiovascular disease

- demonstrates a highly competent ability to explain how smoking and excessive alcohol intake are involved in the development of cardiovascular disease
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

AVAILABLE MARKS

Examples of suitable points to be described by the candidate:

AVAILABLE MARKS

- development of cardiovascular disease
  - occurs when cholesterol plaque builds up in the walls of the arteries, a process called atherosclerosis which over time, can cause significant narrowing of the coronary arteries; when coronary arteries narrow, the blood supply beyond the plaque becomes inadequate to meet the increased oxygen demand of the heart muscle during exercise, lack of oxygen (ischemia) in the heart muscle may cause angina
  - when a blood clot (thrombus) forms on the plaque, the artery may become completely blocked, causing death of a part of the heart muscle (myocardial infarction)

Examples of suitable points to be explained by the candidate:

- excessive alcohol
  - more than 55 units (men) and more than 35 units (women) of alcohol per week is deemed to increase the risk of cardiovascular disease
  - binge drinking increases triglycerides and LDL which may cause a sudden heart attack
  - excessive alcohol raises blood pressure which then may increase the risk of cardiovascular disease

- smoking
  - nicotine stimulates the body to produce adrenaline, making the heart beat faster, nicotine also increases blood pressure
  - carbon monoxide attaches itself to haemoglobin which results in tissues being starved of oxygenated blood, causing them to suffocate and die; smokers are also likely to experience shortness of breath and increased heart rate as a result of carboxyhaemoglobin levels
  - increased total blood cholesterol levels as a result of the chemical acrolein, which affects the way the body processes cholesterol, allowing greater amounts to remain in the blood system; this decreases the ratio of high-density lipoprotein to low-density lipoprotein leading to atherosclerosis
  - many of the toxins in tobacco cause damage to the blood vessel walls, allowing plaque to form at a faster rate than in a non-smoker

All other valid points will be given credit. [15] 15

8 Discuss the potential health benefits of regular physical activity for adults. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of the potential health benefits of regular physical activity for adults
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the health benefits of regular physical activity for adults
- quality of written communication is basic

Mark Band 2 ([4]–[7])
Overall impression: adequate
- adequate knowledge and understanding of the potential health benefits of regular physical activity for adults
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the health benefits of regular physical activity for adults
- quality of written communication is adequate

Mark Band 3 ([8]–[11])
Overall impression: competent
- competent knowledge and understanding of the potential health benefits of regular physical activity for adults
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss the health benefits of regular physical activity for adults
- quality of written communication is competent

Mark Band 4 ([12]–[15])
Overall impression: highly competent
- clear knowledge and understanding of the potential health benefits of regular physical activity for adults
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the health benefits of regular physical activity for adults
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be discussed by the candidate:

AVAILABLE MARKS

- control of body weight: regular physical activity helps to maintain a healthy body weight by increasing energy output

- reduced risk of heart disease: physical activity can improve the balance of HDL and LDL cholesterol; physical activity helps control weight, reduces blood pressure these are all risk factors for CVD

- reduced risk of bowel cancer: regular physical activity leads to regular bowel movements, this means that cancer-causing substances in undigested food pass through the bowel more quickly

- improved mental health: regular physical activity reduces the risk of anxiety and stress; physical activity seems to have an effect on certain chemicals in the brain so they affect mood and thinking

- joints: lubricates joints, avoids limitation in movement and maintains flexibility

- builds skeletal muscle and bone: increases body strength and reduces the risk of osteoporosis

All other valid points will be given credit. [15] | 15

Total Marks | **80**

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Rewarding Learning

ADVANCED
General Certificate of Education
2018

Nutrition and Food Science

Assessment Unit A2 1

assessing

Option A: Food Security and Sustainability

or

Option B: Food Safety and Quality

[CODE]

SPECIMEN

MARK SCHEME

Option A: Food Security and Sustainability

AVAILABLE MARKS

Section A

1 (a) Outline the arguments that could be used to convince consumers to buy Fairtrade-certified products. (AO1, AO2)

Mark Band 1 ([1]–[2])
Overall impression: basic
- basic knowledge and understanding of arguments that could be used to convince consumers to buy Fairtrade-certified products
- demonstrates a limited ability to apply this knowledge and understanding to the question
- demonstrates a limited ability to outline these arguments
- quality of written communication is basic

Mark Band 2 ([3]–[5])
Overall impression: adequate
- adequate knowledge and understanding of arguments that could be used to convince consumers to buy Fairtrade-certified products
- demonstrates an adequate ability to apply this knowledge and understanding to the question
- demonstrates an adequate ability to outline these arguments
- quality of written communication is adequate

Mark Band 3 ([6]–[8])
Overall impression: competent
- competent knowledge and understanding of arguments that could be used to convince consumers to buy Fairtrade-certified products
- demonstrates a competent ability to apply this knowledge and understanding to the question
- demonstrates a competent ability to outline these arguments
- quality of written communication is competent

Mark Band 4 ([9]–[10])
Overall impression: highly competent
- clear knowledge and understanding of arguments that could be used to convince consumers to buy Fairtrade-certified products
- demonstrates a highly competent ability to apply this knowledge and understanding to the question
- demonstrates a highly competent ability to outline these arguments
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be outlined by the candidate:

AVAILABLE MARKS

- protects workers: workers on plantations are guaranteed legal minimum wages or above, decent working conditions and the right to join a trade union; there is no forced or child labour

- supports communities: a Fairtrade premium is paid on top of the Fairtrade minimum price, this is invested in social, environmental and economic development projects such as schools, clinics, electricity supply

- protects the environment: the use of agricultural chemicals is minimised and producers are often trained in sustainable techniques such as composting and using recycled materials

- fair prices: the Fairtrade minimum price defines the lowest possible price that a buyer of Fairtrade products must pay the producer; when the market price is higher than the minimum price, the market price is payable

- genetically modified (GM): the Fairtrade system's environmental standards forbid the use of GM seeds by farmers.

All other valid points will be given credit. [10] 10

(b) Explain how the following assurance schemes assist consumers who want to make environmental and ethical food choices:

- LEAF
- Rainforest Alliance
- Marine Stewardship Council.(AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic

- basic knowledge and understanding of the listed assurance schemes
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the usefulness of the assurance schemes for consumers who want to make environmental and ethical food choices
- quality of written communication is basic

Mark Band 2 ([4]–[7])
Overall impression: adequate

- adequate knowledge and understanding of the listed assurance schemes
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain the usefulness of the assurance schemes for consumers who want to make environmental and ethical food choices
- quality of written communication is adequate

Mark Band 3 ([8]–[11])
Overall impression: competent

- competent knowledge and understanding of the listed assurance schemes
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain the usefulness of the assurance schemes for consumers who want to make environmental and ethical food choices
- quality of written communication is competent

Mark Band 4 ([12]–[15])
Overall impression: highly competent

- clear knowledge and understanding of the listed assurance schemes
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain the usefulness of the assurance schemes for consumers who want to make environmental and ethical food choices
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be explained by the candidate:

AVAILABLE MARKS

- LEAF:
  - environment: the LEAF Marque logo gives consumers greater assurance that the food they buy has been produced in an environmentally responsible way. All LEAF Marque farmers have been inspected by an independent verifier to ensure they meet rigorous environmentally responsible farming standards
  - controls: this scheme requires farmers to audit their production systems and examine soil management, fertility, pesticide use, and pollution control and management
  - sustainability: it encourages farms to have an 'integrated farm management system', to reduce farming's impact on the environment, and is geared towards sustaining and optimising the use of all resources on farms including soil, water, air, staff, machinery, wildlife habitats and landscapes

- Rainforest Alliance:
  - support for farmers: by choosing Rainforest Alliance certified products, consumers can support farmers and farm workers worldwide who are working to improve their livelihoods while protecting the planet
  - sustainability: Rainforest Alliance certification encourages farmers to grow crops and manage land sustainably. Consumers can be confident that this scheme guarantees environmental protection, social equity and economic viability
  - farm management: the certification standards guide farmers toward sustainable farm management encouraging social and environmental improvements
  - price premium: certification gives farm owners better access to speciality buyers, contract stability, favourable credit options, publicity, technical assistance and premium markets. Most farmers are able to receive a price premium because their farms are certified. The consumer is assured that a fair price is paid to the farmer

- Marine Stewardship Council:
  - overfishing: consumers can be confident that they are not buying fish from overfished stocks and badly managed fisheries or fish farms
  - endangered stock: support organisations and businesses that sell sustainably caught or farmed fish. Consumers can look for the Marine Stewardship Council (MSC) logo which shows it is certified to come from well-managed fisheries and not from endangered stocks
  - work with developing countries: half of the world's seafood comes from developing countries, where millions rely on fish as a vital source of nutrition and income. MSC work with partners to give fisheries from developing countries equal opportunities

– MSC ecolabel: by choosing fish with the MSC ecolabel consumers are supporting independently certified sustainable fisheries, whose good management practices help combat overfishing, protect the marine environment and secure fishing community livelihoods

All other valid points will be given credit. [15]

AVAILABLE MARKS

15

Section B

AVAILABLE MARKS

2 Examine the role of the consumer as a contributor to the problem of food and associated packaging waste. (AO1, AO2, AO3)

Mark Band 1 ([1]–[5])
Overall impression: basic
- basic knowledge and understanding of the problem of food and associated packaging waste
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to examine the role of the consumer as a contributor to the problem of food and associated packaging waste
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate
- adequate knowledge and understanding of the problem of food and associated packaging waste
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to examine the role of the consumer as a contributor to the problem of food and associated packaging waste
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent
- good knowledge and understanding of the problem of food and associated packaging waste
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to examine the role of the consumer as a contributor to the problem of food and associated packaging waste
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent
- clear knowledge and understanding of the problem of food and associated packaging waste
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to examine the role of the consumer as a contributor to the problem of food and associated packaging waste
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be examined by the candidate:

AVAILABLE MARKS

- food waste:
  - food waste: approximately 60% food waste arises from products not being used in time, the majority of which is made up of perishable, short shelf-life products and includes 17 billion portions of fresh produce bought but not eaten
  - limited food planning: many consumers are guilty of limited planning when shopping for food, e.g. failing to write a shopping list and/or a weekly meal plan which could prevent buying more food than needed
  - poor food pack selection: consumers frequently select the wrong size of pack to match need when shopping for food, e.g. selecting a standard pack instead of a portion pack, a large loaf instead of smaller loaf, or availing of 3 for 2 offers in supermarkets which encourages food waste in the home; consumers could make better use of new packaging technology to avoid food waste by purchasing, e.g. fridge packs for baked beans, subdivided fruit packs for use now/save for later
  - limited awareness of portion size when preparing meals: a poor understanding of portion size, e.g. rice, potatoes or pasta can result in excess food being wasted due to limited creativity in the use of leftovers at a later mealtime
  - poor food storage: WRAP UK suggests consumers are not making best use of storage information on labelling or packaging functionality to keep food fresh for longer, e.g. resealable bags, lack of awareness of the benefits packaging can offer to maximise home shelf life thus shortening freshness, for example, consumers adopted unpacking strategies that potentially decreased the longevity of products, e.g. opening bags of apples, storing fruit in a fruit bowl instead of the refrigerator, refrigerating carrots instead of storing these loose in a cool dark place
  - poor food disposal: limited use of home composting by consumers as a preferred means of disposing of organic food waste

- food associated packaging waste:
  - poor food choices: when consumers select over packaged products, bottled water in preference to tap water or plastic packaged fruit and vegetables they contribute to environmental problems
  - poor food packaging disposal: consumer ignorance exists regarding ways to recycle certain food packaging materials as the On Pack Recycling Label (OPRL) is not used to inform their method of disposal, consumers are unsure of how to dispose of food packaging of plastic origin
  - limited recycling facilities: some consumers have expressed difficulty recycling specific materials as they are not part of local authority household recycling schemes

All other valid points will be given credit. [20] 20

3 Consider the social and environmental cost of shopping for food in supermarkets. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[5])
Overall impression: basic
- basic knowledge and understanding of the social and environmental cost of shopping for food in supermarkets
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to consider the social and environmental cost of shopping for food in supermarkets
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate
- adequate knowledge and understanding of the social and environmental cost of shopping for food in supermarkets
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to consider the social and environmental cost of shopping for food in supermarkets
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent
- good knowledge and understanding of the social and environmental cost of shopping for food in supermarkets
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to consider the social and environmental cost of shopping for food in supermarkets
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent
- clear knowledge and understanding of the social and environmental cost of shopping for food in supermarkets
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to consider the social and environmental cost of shopping for food in supermarkets
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be considered by the candidate:

AVAILABLE MARKS

- environmental cost:
  - large shed-like structured buildings take up land: often built on green belts, buildings require added infrastructure to support traffic volume; land cannot be used for farming, local wildlife destroyed
  - heating, lighting and air-conditioning systems emit greenhouse gas emissions into the atmosphere and use up vast amounts of electricity; many older buildings are not designed to include energy-efficient systems or technology to reduce the amount of heat and air-conditioning they use
  - waste packaging and food sent to landfill can eventually leach harmful chemicals into the ground and water; decomposition of waste leads to methane gas emissions contributing to global warming and climate change
  - increased movement of food via road freight contributes to air pollution; increasing carbon monoxide, nitrogen oxides and hydrocarbons in the atmosphere
  - increased pesticide use as supermarkets demand high appearance standards (shape, colour, size, uniformity) putting pressure on the farmer to supply the perfect fruit or vegetable leading to wastage of food which doesn't meet the standard demanded
  - higher dependence of imported food as supermarkets do not always support local and seasonal food; air freight emits more greenhouse gases per food mile than any other mode of transport

- social cost:
  - pricing policies favour increased consumption of unhealthy food which accounts for the decline in health of the local community
  - decline of the high street: disinvestment, derelict buildings, drawing shoppers away from town centres and removing character and draining money away from the local area
  - social exclusion: food deserts discriminate against low income shoppers with limited transport, marginalising those without cars
  - ruination of the small scale local farmer as high demands encourage large scale farming systems offering uniform standards
  - unequal power relationship between supermarket and producers/ farmer
  - manipulation of shoppers through clever marketing techniques encouraging impulse buying

All other valid points will be given credit. [20]

20

4 Discuss the barriers that prevent consumers from making sustainable food choices. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[5])
Overall impression: basic
- basic knowledge and understanding of sustainable food choices
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to discuss the barriers that prevent consumers from making sustainable food choices
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate
- adequate knowledge and understanding of sustainable food choices
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to discuss the barriers that prevent consumers from making sustainable food choices
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent
- good knowledge and understanding of sustainable food choices
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to discuss the barriers that prevent consumers from making sustainable food choices
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent
- clear knowledge and understanding of sustainable food choices
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the barriers that prevent consumers from making sustainable food choices
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be discussed by the candidate:

AVAILABLE MARKS

- limited knowledge: LiveWell for Life research suggests consumer confusion exists over what is and what is not a sustainable food choice, reporting widespread public confusion surrounding climate change as well as a lack of awareness and information on the carbon footprint of a product

- consumer confusion: many consumers report being confused about terms such as organic, natural and environmentally friendly, with European-wide research suggesting only a minority of EU citizens recognise EU food quality assurance logos

- habits: routine locks consumers into their current lifestyle and a pattern of food choice and buying behaviour making it difficult to change old habits and form new ones, especially when sustainable food choices are not the norm

- perceived higher costs: socio-economic status is an important factor in sustainable food choice as research shows price is the second most important consideration after quality for European consumers when shopping for food, especially important for those struggling to pay bills. UK government research found the most common barrier to sustainable food consumption was expense.

- cultural issues: important barrier especially when eating meat as research suggests that meat is a vital part of culinary cultures in western Europe and many consumers see meat as an essential part of a meal. Authors of the 2011 study 'The Protein Puzzle' note that eating less meat and dairy products has environmental and health benefits, but changing consumption patterns is a slow cultural process

- time and lifestyle: people feel a sustainable diet takes longer to think about, prepare and cook as the trend of convenience food is driven by busy lifestyles, more women working outside the home, changes in household composition, increases in disposable income and revolutions in food processing. These factors influence how consumers prepare and eat food and have resulted in an increase in the consumption of ready meals and fast food in and out of the home, meaning consumers are increasingly distanced from the production of foodstuffs

- ease of access: access doesn't seem to be as important where shops offer healthy, sustainable choices however the abundant availability of unhealthy, unsustainable foods, which are attractively marketed and priced is a stronger barrier to making better choices

All other valid points will be given credit. [20] 20

5 Argue the ethical and environmental merits of the following advice from Sustain:

- buy local, seasonally available ingredients; and
- buy food from farming systems that minimise harm to the environment such as certified organic produce

(AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[5])

Overall impression: basic

- basic knowledge and understanding of ethical and environmental food issues for the consumer
- demonstrates a limited ability to apply this knowledge and understanding to the question
- demonstrates a limited ability to argue the merits of each piece of advice listed in the question
- quality of written communication is basic

Mark Band 2 ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of ethical and environmental food issues for the consumer
- demonstrates an adequate ability to apply this knowledge and understanding to the question
- demonstrates an adequate ability to argue the merits of each piece of advice listed in the question
- quality of written communication is adequate

Mark Band 3 ([11]–[15])

Overall impression: competent

- good knowledge and understanding of ethical and environmental food issues for the consumer
- demonstrates a competent ability to apply this knowledge and understanding to the question
- demonstrates a competent ability to argue the merits of each piece of advice listed in the question
- quality of written communication is competent

Mark Band 4 ([16]–[20])

Overall impression: highly competent

- clear knowledge and understanding of ethical and environmental food issues for the consumer
- demonstrates a highly competent ability to apply this knowledge and understanding to the question
- demonstrates a highly competent ability to argue the merits of each piece of advice listed in the question
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be argued by the candidate:

AVAILABLE MARKS

Buy local, seasonally available ingredients:

- Ethical merits:
  - the local community benefits: buying locally is directly supporting local businesses; leads to employment; ensures money is kept within that local community and does not contribute to the profits of supermarkets

- Environmental merits:
  - fossil fuel consumption: buying locally grown and prepared food reduces fossil fuel and energy use by the consumer and the food industry; this reduces greenhouse gas emissions which contribute to climate change
  - sustainable farming methods: locally grown produce is more likely to have used sustainable farming methods such as enriching the soil, protecting air and water quality, and minimising energy consumption
  - waste: 95% of food is over packaged using non-environmentally friendly plastic packaging materials; most locally produced food is available to be selected by hand and with minimum packaging
  - seasonal food: does not need to be imported, does not require energy-intensive conditions such as, heated greenhouses and reduces the likelihood of energy-intensive methods of storage and transport such as, refrigeration and air-freighting

Buy food from farming systems that minimise harm to the environment such as certified organic produce:

- Ethical merits:
  - animal welfare: certified organic farmers must operate to high standards of animal welfare. Under organic rules, all aspects of animal welfare are tightly controlled, including rearing, shelter, feeding, transportation and slaughter. Organic animals cannot be given growth promoting hormones, regular doses of antibiotics or genetically modified (GM) feed. Sick animals are treated using homeopathic and complementary remedies, unless a vet says an animal needs antibiotics; in which case they must be given. To ensure that no residues are left, a set period of time has to pass before the animal can produce products for sale as organic. These are on average three times as long as those required by law for non−organic food

	AVAILABLE MARKS
• Environmental merits: – energy: organic production methods are usually less energy-intensive than industrial agriculture. They do not use artificial fertiliser, which uses a large amount of energy and water to produce and results in emissions of the powerful greenhouse gas nitrous oxide – environment: organic standards require farmers to protect the environment, primarily by severely restricting the use of pesticides, and prohibit the use of artificial chemical fertilisers; organic farmers rely on developing a healthy, fertile soil and growing a mixture of crops – wildlife: organic farming depends on a diverse ecosystem to maintain soil fertility and to keep pests under control naturally. It does this by encouraging nature's own predators by maintaining hedgerows, creating open "wild" spaces at the side of fields, and changing the crops planted each season, to keep soil fertile and avoid the need for chemicals – genetically modified (GM) crops and ingredients are banned All other valid points will be given credit. [20]	20

Option B: Food Safety and Quality

AVAILABLE MARKS

Section A

1 (a) Explain how consumers can avoid food poisoning from *Campylobacter.* (AO1, AO2)

Mark Band 1 ([1]–[2])
Overall impression: basic
- basic knowledge and understanding of campylobacter
- demonstrates a limited ability to apply this knowledge and understanding to the question
- demonstrates a limited ability to explain how consumers can avoid food poisoning from this bacteria
- quality of written communication is basic

Mark Band 2 ([3]–[5])
Overall impression: adequate
- adequate knowledge and understanding of campylobacter
- demonstrates an adequate ability to apply this knowledge and understanding to the question
- demonstrates an adequate ability to explain how consumers can avoid food poisoning from this bacteria
- quality of written communication is adequate

Mark Band 3 ([6]–[8])
Overall impression: competent
- competent knowledge and understanding of campylobacter
- demonstrates a competent ability to apply this knowledge and understanding to the question
- demonstrates a competent ability to explain how consumers can avoid food poisoning from this bacteria
- quality of written communication is competent

Mark Band 4 ([9]–[10])
Overall impression: highly competent
- clear knowledge and understanding of campylobacter
- demonstrates a highly competent ability to apply this knowledge and understanding to the question
- demonstrates a highly competent ability to explain how consumers can avoid food poisoning from this bacteria
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be explained by the candidate:

AVAILABLE MARKS

- raw poultry and meat: campylobacter is found in most raw poultry and is common in raw meat so consumers should avoid cross contamination, e.g. by not storing raw and cooked foods together, not using the same work surfaces or utensils when preparing raw and cooked food, not washing raw poultry, cooking food thoroughly, especially meat, so that it is piping hot, as this will destroy any campylobacter

- infected pets, birds and other animals: it is possible to get campylobacter from infected animals and birds so consumers should wash hands thoroughly with soap and warm water after contact with pets, other animals and birds

- farm visits: consumers are advised to pay special attention to hygiene during farm visits, washing hands after any contact with animals and eating only in designated areas

All other valid points will be given credit. [10]

(b) Describe the work carried out by the Environmental Health Practitioner (EHP) to reduce the possibility of food poisoning for consumers. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[3])
Overall impression: basic
- basic knowledge and understanding of the work of the Environmental Health Practitioner in relation to the prevention of food poisoning
- demonstrates a limited ability to apply this knowledge and understanding to the question
- demonstrates a limited ability to describe this work
- quality of written communication is basic

Mark Band 2 ([4]–[7])
Overall impression: adequate
- adequate knowledge and understanding of the work of the Environmental Health Practitioner in relation to the prevention of food poisoning
- demonstrates an adequate ability to apply this knowledge and understanding to the question
- demonstrates an adequate ability to describe this work
- quality of written communication is adequate

Mark Band 3 ([8]–[11])
Overall impression: competent
- competent knowledge and understanding of the work of the Environmental Health Practitioner in relation to the prevention of food poisoning
- demonstrates a competent ability to apply this knowledge and understanding to the question
- demonstrates a competent ability to describe this work
- quality of written communication is competent

Mark Band 4 ([12]–[15])
Overall impression: highly competent
- clear knowledge and understanding of the work of the Environmental Health Practitioner in relation to the prevention of food poisoning
- demonstrates a highly competent ability to apply this knowledge and understanding to the question
- demonstrates a highly competent ability to describe this work
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be described by the candidate:

AVAILABLE MARKS

- hygiene: the Environmental Health Practitioner (EHP) inspects places where food is handled, such as docks, airports, public houses, markets, food shops and restaurants, to ensure that food safety and food hygiene regulations are being adhered to. Food stalls and other vehicles carrying food are also included. They check the hygiene conditions in these outlets and that the food in them is not in any way contaminated

- complaints: the EHP investigates complaints about unsatisfactory food, e.g. contaminated food bought from a shop, a foreign object found in food or a dirty eating place. In serious cases of poor food hygiene, the EHP will arrange for legal proceedings to be taken against the offender advice; rather than enforce the law, EHPs prefer food handlers to be made aware of their responsibilities and their rights in environmental health. EHPs run courses on food safety and organise specialised lectures for personnel working in the food industry. Successful candidates receive a certificate in the practices and principles of food hygiene

- water: EHPs carry out monitoring of drinking water in food premises, public supplies and group water schemes. Private individuals may have water tested for a fee and advice regarding the result on any analysis

- port health: EHPs are responsible for the monitoring of food imports from non−EU countries and issuing of exemption certificates at designated ports

All other valid points will be given credit. [15] 25

Section B

AVAILABLE MARKS

2 Explore the controversy surrounding the use of additives in food. (AO1, AO2, AO3)

Mark Band 1 ([1]–[5])
Overall impression: basic
- basic knowledge and understanding of the controversial use of additives in food
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to explore these issues
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate
- adequate knowledge and understanding of the controversial use of additives in food
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to explore these issues
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent
- good knowledge and understanding of the controversial use of additives in food
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to explore these issues
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent
- clear knowledge and understanding of the controversial use of additives in food
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to explore these issues
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be explored by the candidate:

AVAILABLE MARKS

- controversy surrounding colours:
  - some parents report artificial colours and preservatives trigger hyperactivity in their children. Although randomised controlled trials have generally failed to demonstrate a link, studies suggest that mixes of certain artificial colours used in foods and drinks together with the preservative sodium benzoate, are associated with hyperactivity in some children, although it is not yet clear whether this is the cause of the hyperactivity
  - the Food Standards Agency (FSA) warns that eating foods or drinks containing tartrazine can cause nettle rash (urticaria), dermatitis (an allergic skin condition), asthma, or rhinitis (runny nose) but only in a small number of people
  - artificial colourings are typically used to encourage children and adults to consume brightly coloured, highly processed food stuffs Such foods tend to be high in calories but often have little other nutritional value. Artificial colourings may thus encourage the consumption of an unhealthy diet, which is linked to many health problems, such as obesity and coronary heart disease

- controversy surrounding sodium benzoate:
  - the FSA warns that sodium benzoate and other benzoates could make the symptoms of asthma and eczema worse in children who already have these conditions
  - sodium benzoate has been a subject of concern in relation to cancer, when mixed with the additive vitamin C in soft drinks it causes benzene, a carcinogenic substance
  - significant research found that benzoate causes damage to the mitochondria, an important area of DNA; diseases being linked to this damage include Parkinson's, neuro-degenerative diseases and ageing

- controversy surrounding aspartame:
  - Ramazzini Foundation concluded aspartame caused several types of cancer in rats at doses very close to the current acceptable daily intake for humans. The findings have been challenged by the sweetener industry and major sweetener users, e.g. Coca-Cola and Nestlé
  - the European Food Safety Authority (EFSA) reconfirmed that aspartame was safe. Having reviewed the Italian study, its scientific experts decided no further review of the safety of aspartame was needed nor a revision of the previously established acceptable daily intake for aspartame

- controversy surrounding monosodium glutamate (MSG):
  - many believe MSG is responsible for conditions such as headaches, stomach disorders, fatigue, depression, itchiness and numbness but governments with a food licensing and testing system state that, “at normal levels in the diet”, MSG is recognised as safe
  - the case against MSG remains unproven, but there remains a large body of respected nutritionists who are sure that MSG causes problems for many people, especially children

All other valid points will be given credit. [20]

AVAILABLE MARKS

20

3 Explain the work of the Food Standards Agency (FSA) and the Department of Agriculture and Rural Development (DARD) in relation to food safety. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[5])
Overall impression: basic
- basic knowledge and understanding of the work of the Food Standards Agency (FSA) and the Department of Agriculture and Rural Development (DARD) in relation to food safety
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to explain the work of these two agencies in relation to food safety
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate
- adequate knowledge and understanding of the work of the Food Standards Agency (FSA) and the Department of Agriculture and Rural Development (DARD) in relation to food safety
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to explain the work of these two agencies in relation to food safety
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent
- good knowledge and understanding of the work of the Food Standards Agency (FSA) and the Department of Agriculture and Rural Development (DARD) in relation to food safety
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to explain the work of these two agencies in relation to food safety
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent
- clear knowledge and understanding of the work of the Food Standards Agency (FSA) and the Department of Agriculture and Rural Development (DARD) in relation to food safety
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to explain the work of these two agencies in relation to food safety
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Examples of suitable points to be explained by the candidate:

AVAILABLE MARKS

- work of the Food Standards Agency (FSA):
  - FSA Foodborne Disease strategy: based on a farm-to-fork approach, aims to reduce contamination of foods during production and processing and promoting good food hygiene practice in the kitchen, both commercially and in the home
  - allergy alerts: the FSA keeps consumers informed about food allergy risks, e.g. product recall because of incorrect allergy labelling. Consumers can sign up for FSA alerts by email or SMS text
  - advice/information for consumers: the FSA website provides up-to-date, unbiased advice/information for consumers on a range of food safety issues such as acrylamide in food, additives, allergy and intolerance, bisphenol-A, BSE, food poisoning, GM foods, irradiated foods, food labelling, mycotoxins, nanotechnology, novel foods, packaging, pesticides, radioactivity on food and veterinary medicines. Advice/ information is based on research that they commission. The agency also provides food safety advice for schools and childminders, those starting a food business and importing food
  - advice/information for caterers and the food industry: the agency provides advice and guidance for farmers, food producers and distributors, food retailers and caterers, e.g. they provide food safety advice for butchers and guidance and information for the hygienic production of fish and shellfish, advice for caterers on a range of food safety issues such as, allergy and intolerance, food safety and labelling regulations and food poisoning. FSA provides a wide range of resources, videos and publications to help with food safety training
  - Clean Livestock Guidance: FSA provides advice and guidance on the Clean Livestock Policy campaign; as part of the agency's foodborne disease target and strategy to control campylobacter in chickens
  - hygiene rating scheme: the FSA, in partnership with local authorities, is rolling out the National Food Hygiene Rating Scheme. The scheme helps reduce the incidence of foodborne illness by giving consumers information about the hygiene standards in restaurants, cafes, takeaways, hotels and food shops. The scheme also encourages businesses to improve hygiene standards

- work of the Department of Agriculture and Rural Development (DARD):
  - meat inspection: DARD has a central role in approved slaughter and cutting establishments through the Veterinary Public Health Programme (VPHP). The primary aim of VPHP is to protect and verify food business operators compliance with food law
  - milk and milk products: DARD has responsibility for ensuring that purchasers, hauliers, raw milk suppliers, processors and distributors comply with the Hygiene Regulations for Milk. They are responsible for the enforcement of regulations on milk production holdings in Northern Ireland. All milk businesses comply with the regulations which govern the production of safe food
  - personal food imports: diseases like foot and mouth disease and bird flu can be brought into Northern Ireland (NI) via animal products (particularly those containing meat or milk). Animal-related products may also risk human health from diseases, residues or contaminants e.g. from fish, honey, untreated animal hides. DARD plays a role in checks, seizures, penalties and appeals in relation to food importation. DARD has responsibility in Northern Ireland for detecting smuggled goods from non-EU countries. Any illegal products identified by DARD are taken away and destroyed
  - egg packers: all egg packers must comply with hygiene regulations which govern the production of safe food. These regulations have their origins in European legislation and are designed to ensure consumers are protected by requiring food businesses adhere to them. DARD Agri-food Inspection Branch (AfIB) carries out inspections and provides guidance on legislation relating to egg packers
  - animal medicines and residues: DARD provides information in relation to authorised medicines and residues in food producing animals to ensure safety throughout the food chain
  - animal feed and primary production hygiene: a 'farm to fork' approach ensures food safety throughout the food chain starting with primary production. Farmers that feed animals and/or produce crops for animal feed must also ensure feed safety for food producing animals. All primary producers must comply with Food Hygiene Regulations (NI) 2006 to control potential food hazards at farm level. DARD is responsible for inspections under these regulations

All other valid points will be given credit. [20]

AVAILABLE MARKS

20

4 Discuss the reasons why food allergies are increasing and outline the current food allergen labelling and information regulations.
(AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[5])
Overall impression: basic
- basic knowledge and understanding of food allergies and current allergen legislation
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to discuss the reasons why food allergies are increasing
- demonstrates a limited ability to outline the current food allergen labelling and information regulations
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate
- adequate knowledge and understanding of food allergies and current allergen legislation
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to discuss the reasons why food allergies are increasing
- demonstrates an adequate ability to outline the current food allergen labelling and information regulations
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent
- good knowledge and understanding of food allergies and current allergen legislation
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to discuss the reasons why food allergies are increasing
- demonstrates a competent ability to outline the current food allergen labelling and information regulations
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent
- clear knowledge and understanding of food allergies and current allergen legislation
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the reasons why food allergies are increasing
- demonstrates a highly competent ability to outline the current food allergen labelling and information regulations
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be discussed by the candidate:

AVAILABLE MARKS

- Allergen Increase:
  - fats: many consumers have switched from eating butter and other saturated fats to consuming vegetable oils in margarines and processed foods; some scientists believe it is also involved in stimulating the immune system in a way that can cause damage
  - western diets: can be very high in additives and preservatives that can trigger reactions. The rate of allergies has increased in line with the increasing popularity of fast food and ready meals
  - fresh fruit and vegetables: scientists have discovered a link between the lack of intake during childhood and inadequate development of a normal immune system
  - allergenic foods: it has been suggested that the increased rate of food allergies might be due to more allergenic foods, such as peanut, in our diet
  - reduced levels of nutrients: in particular vitamin D, omega-3 fatty acids (in fish) or antioxidants might contribute to the development of allergy. A diet low in oily fish has been associated with increased risk of childhood asthma and allergies in some studies
  - breast-feeding: this is promoted as a way to prevent food allergy Rates of breast-feeding are relatively low in modern society
  - genetics: children born into families where allergies already exist have a higher than average chance of developing allergies themselves. If both parents have allergies, the risk is increased to 60–80%. As rates increase, so too will the genetic predisposition to develop an allergy

- Labelling and Allergens:
  - declaration: 14 allergens are recognised across Europe as the most common ingredients or processing aids causing food allergies. If a food product contains or uses an ingredient or processing aid derived from one of the substances or products listed it will need to be declared
  - format: information about allergenic ingredients could be located in a single place, i.e. the ingredients list on pre-packed food. Businesses can choose what method they want to use to emphasise these allergens, for example, by listing them in bold italics, highlighted or underlined, to help identify them
  - non-prepacked: for food businesses which provide non prepacked food, such as restaurants, takeaways, bakeries and institutional caterers, there is a requirement to provide information on allergenic ingredients. This information can be provided in writing and/or orally

– symbols: the use of icons or symbols to indicate the presence of allergens is permitted provided it is accompanied by words and numbers to ensure uniform consumer understanding and avoid misleading the consumer. Currently there is no single agreed set of icons or symbols for indicating the presence of allergens in prepacked and non-prepacked foods
– warnings: the use of statements such as 'Contains: milk, nuts' to summarise allergen ingredient information on the packaging is not permitted. The only exception to this is for products that do not have an ingredients list, such as wine where a 'Contains: sulphites' would appear

All other valid points will be given credit. [20]

AVAILABLE MARKS

20

5 Describe the possible risks to public health of each of the following chemical contaminants:

- dioxins
- heavy metals such as mercury, lead and cadmium
- Bisphenol-A (BPA)

(AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band 1 ([1]–[5])
Overall impression: basic

- basic knowledge and understanding of the risks to public health of dioxins, heavy metals and Bisphenol-A
- demonstrates a limited ability to apply knowledge and understanding to the question
- demonstrates a limited ability to describe the possible risks to public health of each of the listed chemical contaminants
- quality of written communication is basic

Mark Band 2 ([6]–[10])
Overall impression: adequate

- adequate knowledge and understanding of the risks to public health of dioxins, heavy metals and Bisphenol-A
- demonstrates an adequate ability to apply knowledge and understanding to the question
- demonstrates an adequate ability to describe the possible risks to public health of each of the listed chemical contaminants
- quality of written communication is adequate

Mark Band 3 ([11]–[15])
Overall impression: competent

- good knowledge and understanding of the risks to public health of dioxins, heavy metals and Bisphenol-A
- demonstrates a competent ability to apply knowledge and understanding to the question
- demonstrates a competent ability to describe the possible risks to public health of each of the listed chemical contaminants
- quality of written communication is competent

Mark Band 4 ([16]–[20])
Overall impression: highly competent

- clear knowledge and understanding of the risks to public health of dioxins, heavy metals and Bisphenol-A
- demonstrates a highly competent ability to apply knowledge and understanding to the question
- demonstrates a highly competent ability to describe the possible risks to public health of each of the listed chemical contaminants
- quality of written communication is highly competent

Award [0] for a response not worthy of credit.

Some examples of suitable points to be described by the candidate:

AVAILABLE MARKS

- Dioxins:
  - for most people, 90% of human dioxin exposure comes from food, particularly meat, fish, poultry, cheese, milk, butter, free range eggs and oily fish have been measured as having high levels
  - according to the FSA, dioxins have no immediate effect on health, even at the highest levels found in foods. The potential risks to health come from long-term exposure to high levels
  - exposure to high levels have been shown to cause a wide range of effects, including cancer, adverse reproductive and developmental effects, birth defects, immune system abnormalities, endometriosis, heart related conditions, skin disease such as chloracne and other skin effects such as, rashes

- Heavy metals:

  Mercury:
  - mercury in the form of its methyl compounds is specifically the most toxic of the heavy metals; when consumed orally, it first passes into the liver, the kidneys and the brain although accumulation only takes place temporarily and a large part is excreted with the faeces
  - the FSA has given advice about fish consumption for pregnant women since excessive consumption of shark, marlin and swordfish could pose a risk to the development of the nervous system and brain for the unborn child

  Lead:
  - human exposure is mainly through food although levels have been falling in the UK
  - children can be especially vulnerable as they consume more food per kilogram of body weight than adults and developing organs are more susceptible to toxic effects of lead
  - risks are low to negligible for most adults although long-term exposure can cause anaemia, lethargy, kidney or liver damage or high blood pressure

  Cadmium:
  - in humans cadmium is a cumulative poison, i.e. the danger lies primarily in the regular consumption of foodstuffs with low contamination
  - cadmium absorption after dietary exposure is relatively low (3–5%) but cadmium is efficiently retained in the kidney and liver in the human body frequently resulting in kidney damage
  - no connection with cancerous disorders has been found
  - cadmium is not known to damage the unborn child as it does not transfer easily from mother to baby
  - the levels of cadmium exposure through foods that are consumed by most people are not of major health concern

	AVAILABLE MARKS
• Bisphenol-A (BPA): – very small amounts of BPA can transfer from packaging into food and drinks, but these levels of exposure are not considered to be harmful – independent experts have calculated how much BPA can be consumed daily over a lifetime without any harm, and the amount absorbed from all food and drink is significantly below this level – independent studies have shown that, even when consumed at high levels, BPA is rapidly absorbed, detoxified, and eliminated from humans and, therefore, is not a health concern All other valid points will be given credit. [20]	20
Total Marks	**85**

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