



Rewarding Learning

General Certificate of Education

Nutrition and Food Science

Assessment Unit A2 1

assessing

OPTION A: Food Security and Sustainability

OPTION B: Food Safety and Quality

[ANF11]

Assessment

**MARK
SCHEME**

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.

Section A

- 1 (a) Describe how primary producers contribute to the problem of food waste. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of the problem of food waste
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe how primary producers contribute to the problem of food waste
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: adequate

- adequate knowledge and understanding of the problem of food waste
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe how primary producers contribute to the problem of food waste
- quality of written communication is adequate

Mark Band ([6]–[8])

Overall impression: competent

- competent knowledge and understanding of the problem of food waste
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe how primary producers contribute to the problem of food waste
- quality of written communication is competent

Mark Band ([9]–[10])

Overall impression: highly competent

- highly competent knowledge and understanding of the problem of food waste
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe how primary producers contribute to the problem of food waste
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

- severe weather; weather at any stage of production can impact upon crop growth and yield leading to waste
- pests and disease; losses from pests, disease and weeds are still substantial in the UK
- inefficient harvesting; damage and loss can be experienced at this stage due to inefficient machinery
- high retail standards; due to high retailing standards in relation to quality and appearance farmers are selective when harvesting which can lead to edible food not entering the human food supply chain. This is a form of food waste
- over-production; for farmers to meet contractual obligations, an excess in

yield is forecast to serve as a contingency, much of this may not reach the market and is thus wasted.
All other valid points will be given credit. [10]

AVAILABLE
MARKS

Specific Marking Instructions Q1a Option A

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 in this question. Refer to descriptions of AOs on Page 2.
- The candidate should provide evidence of their ability to follow the command word describe. The key skills to look for in the response include a clear recall of facts presented in detail and with accuracy.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

(b) Explain the impact of food waste on the environment. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the environmental impact of food waste
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the impact of food waste on the environment
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of the environmental impact of food waste
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain the impact of food waste on the environment
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of the environmental impact of food waste
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain the impact of food waste on the environment
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of the environmental impact of food waste
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain the impact of food waste on the environment
- quality of written communication is highly competent

Examples of suitable points to be discussed by the candidate:

Greenhouse gas emissions

- agriculture; the greenhouse gases methane and nitrous oxide are produced by ruminants and from manures and fertilisers used on the farm to produce food that is ultimately wasted. Both of these gases have more warming power than carbon dioxide
- food manufacture; greenhouse gas emissions come from the production of heat and energy used to manufacture food that is then wasted
- transport; carbon dioxide emissions from modes of transport can be significant especially if less efficient methods are used such as air freight or inefficient distribution to stores

- landfill; methane is formed when food is degraded under anaerobic conditions in landfills
- deforestation; greenhouse gas emissions are caused by deforestation and a large share of global deforestation is driven by need for more arable land to produce food that is ultimately wasted

Water

- agriculture; 70% of water used throughout the world is in agriculture. Food waste represents a great waste of freshwater and ground water resources

Land usage

- agriculture; one third of the world’s total agricultural land is used to grow food that is wasted, so the land is being used for a pointless purpose.
- degradation; this overuse of land for crops such as monocropping destroys, over time, the fertility of the land.

Biodiversity

- deforestation in the name of creating more land for food production destroys natural flora and fauna
- marine ecosystems; marine fisheries destroy marine ecosystems if overfishing takes place. These fish can then be thrown out by the consumer or rejected by suppliers for not meeting standards

All other valid points will be given credit.

[15]

25

AVAILABLE MARKS

Specific Marking Instructions Q1b Option A

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 in this question. Refer to descriptions of AOs on Page 2.
- The candidate should provide evidence of their ability to follow the command word explain. Explain means to clarify a topic so the candidate should demonstrate their ability to structure a clear and coherent response. QWC is important when judging responses to this question.
- Assess the candidate’s QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the ‘best fit’ for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

Section A

25

2 Consider the major challenges to achieving food security. (AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of food security
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider the major challenges to achieving the food security
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of food security
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to consider the major challenges to achieving the food security
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of food security
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to consider the major challenges to achieving the food security
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of food security
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to consider the major challenges to achieving the food security
- quality of written communication is highly competent

Examples of suitable points to be considered by the candidate:

- climate change and severe weather; climate change is likely to increase the frequency and intensity of disasters such as drought, floods and storms. The impact could be destruction of crops, critical infrastructure and key community assets. This will affect food availability, food access and create a vicious cycle of disease and hunger
- climate change and livestock; heat waves could cause stress in animals leaving them vulnerable to disease. Drought reduces the amount of quality forage available to grazing livestock. Changes in temperature and seasons can affect the timing of reproduction and migration of fish leading to large declines in fish population
- land degradation; intensive farming methods are used to produce more and cheaper food per acre. However, these practices contribute to land degradation such as soil infertility and decline of agricultural yields which

- negatively affect food production in the long term
- competition for land; to meet the rising global demand for food, increased acreage will be needed. However, demand for land for other uses such as timber, forest conservation and housing are also intensifying
- intensive farming practices; monocropping depletes the soil of nutrients. Extensive use of synthetic fertilisers can reduce the p^h of the soil which changes the availability of soil nutrients. Use of heavy farm machinery compacts the soil reducing aeration and the ability to absorb water
- population growth; demand for food will rise over coming decades with expected population growth. To meet this demand agriculture must produce more food from a finite resource base and a smaller rural labour force. It must also be able to reduce pressure on natural resources by adopting more efficient and sustainable production methods and adapt to climate change
- increasing urbanisation; rural areas will be facing the need to produce more food for growing urban populations while dealing with the movement of populations from rural areas to cities. Urbanisation brings food and nutrition challenges that are magnified by transformations in food demand and markets, rising food prices and the impact of climate change
- growing affluence; expected growth in purchasing power and rising expectations in developing countries mean that more people will be eating resource-intensive diets rich in meat and dairy products, increasing the demand for crops as animal feed

All other valid points will be given credit.

[20]

20

Specific Marking Instructions Q2 Option A

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command word consider. Look for an in-depth answer that includes a wide range of points presented clearly and objectively.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

- 3 Explore some of the reasons why food poverty is a significant issue for many people in Northern Ireland. (AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of reasons for local food poverty
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explore some of the reasons why food poverty is a significant issue for many people in Northern Ireland
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of local food poverty
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explore some of the reasons why food poverty is a significant issue for many people in Northern Ireland
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of local food poverty
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explore some of the reasons why food poverty is a significant issue for many people in Northern Ireland
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of local food poverty
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explore some of the reasons why food poverty is a significant issue for many people in Northern Ireland
- quality of written communication is highly competent

Examples of suitable points to be explored by the candidate:

- affordability; limited economic resources and the cost of a nutritionally adequate diet are major barriers to sustaining a healthy diet. Food is the only household expense that can be flexible and often other expenses such as fuel and rent take priority over spending on food. Food prices are increasing and this has been compounded by rising housing and energy costs over a sustained period
- insecure employment; half of those in poverty in NI come from a working family. Many workers are taking on poorly paid jobs and zero-hours contracts
- accessibility; access to food which is affordable, healthy and of good quality can be an issue for low-income groups. Difficulty in accessing food can be due to a lack of local shops, limited transportation to out-of-town supermarkets, a lack of storage facilities for food in the home. 1 in 5 people in NI have no access to a vehicle

- lack of skills; cooking skills are declining in NI and consumers may not have the skills to prepare and cook meals; poor literacy and numeracy skills can make it difficult for a person to choose healthy foods
- constrained choices; food poverty does not necessarily mean going hungry. People in lower income households tend to spend a higher proportion of income on food than higher income households. To make this money go further, many are buying cheaper and less nutritious foods that satisfy immediate needs
- low disposable incomes; food prices in NI are comparable to the rest of the UK. However, there is relatively higher deprivation and lower disposable incomes in NI. The failure of benefits to keep pace with inflation has cut the disposable incomes of many of the poorest households
- social exclusion; eating alone has been linked with poorer diets
- marketing pressures; the advertising of unhealthy food, coupled with inadequate nutrition information can be a factor that influences nutritionally-poor dietary choices

All other valid points will be given credit.

[20]

20

AVAILABLE
MARKS

Specific Marking Instructions Q3 Option A

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command word explore. 'Explore some of the reasons' indicates that the candidate should provide context on why the reasons they have chosen are relevant and important.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

- 4 Propose and justify advice to consumers on how to make food choices that have a positive impact on food security and sustainability. (AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of food choices that have a positive impact on food security and sustainability
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to propose and justify advice to consumers on how to make food choices that have a positive impact on food security and sustainability
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of food choices that have a positive impact on food security and sustainability
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to propose and justify advice to consumers on how to make food choices that have a positive impact on food security and sustainability
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of food choices that have a positive impact on food security and sustainability
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to propose and justify advice to consumers on how to make food choices that have a positive impact on food security and sustainability
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of food choices that have a positive impact on food security and sustainability
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to propose and justify advice to consumers on how to make food choices that have a positive impact on food security and sustainability
- quality of written communication is highly competent

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

- reduce meat and dairy consumption; too much land is devoted to raising animals for human consumption and 30% of crops are grown to feed animals. This is an energy intensive way to feed the population and contributes to global greenhouse gas emissions. Land degradation is accelerated by intensive livestock farming
- consume more vegetables; this results in a lower environmental impact as

it reduces methane, nitrous oxide and carbon dioxide production. Growing vegetables also uses less water and reduces the impact of animal waste pollution

- buy local, seasonal products; this contributes to thriving local economies and sustainable livelihoods in the UK and producer countries. This decision can also protect the diversity of plants and animals and the welfare of farmed and wild species. Buying local can reduce carbon dioxide emissions from processing, storage and transport of food
- buy certified products; choosing products which have met specific standards in relation to food security and sustainability for example the Marine Stewardship Council and the Red Tractor Assurance
- consider growing or buying organic produce; organic food production eliminates soil and water contamination as production reduces the use of synthetic chemicals leading to improved biodiversity
- select fish from sustainable sources; many fish stocks are in serious decline and overfishing is a threat to marine wildlife and habitats. Consumers can help reduce the strain on certain species by choosing fish from sustainably managed stocks
- cut down on processed foods; processed foods are often higher in sugar, fat and salt than meals prepared from raw ingredients. Choosing to eat less processed foods reduces the environmental impact of food processing
- aim to be waste free; food waste means that all the natural resources that have been used to make food and its packaging are wasted. Food waste in landfill sites gives off the greenhouse gas methane

All other valid points will be given credit.

[20]

20

Specific Marking Instructions Q4 Option A

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command words propose and justify. The candidate should state their advice clearly and then present detailed evidence in a convincing way to demonstrate good reasons for the advice.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

- 5 Present the arguments for and against the effects that a large supermarket has on local communities. (AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the effects that a large supermarket has on local communities
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to present the arguments for and against the effects that a large supermarket has on local communities
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the effects that a large supermarket has on local communities
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to present the arguments for and against the effects that a large supermarket has on local communities
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the effects that a large supermarket has on local communities
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to present the arguments for and against the effects that a large supermarket has on local communities
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the effects that a large supermarket has on local communities
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to present the arguments for and against the effects that a large supermarket has on local communities
- quality of written communication is highly competent

Examples of suitable points to be presented by the candidate:**Arguments for:**

- supermarkets can revitalise communities; supermarkets can attract other shops and services to an area. They are popular and can provide customers for smaller businesses nearby. Their restaurant areas prove good meeting places for shoppers and they often invest in the local areas as part of the agreement when they build a new shop
- can keep up with demand; smaller businesses can not keep up with the demands of the growing population levels in most cities
- create jobs; supermarkets bring jobs that anyone can do without formal

qualifications or experience and they often employ from disadvantaged groups

- cater for current lifestyles; consumers can generally find all they need in one shop which saves time and effort. It is also possible to shop online and have goods delivered and free car parks make shopping easier. Most meals are easy to cook and convenient to store
- cheaper; supermarkets have the capital to buy large quantities meaning they can sell it for cheaper which benefits consumers, making foods affordable

Arguments against:

- lack of community; in supermarkets there is very little sense of community. Consumers buy and leave with very little communication
- smaller shops cannot compete; large supermarkets open their bigger stores away from town centres, this attracts consumers away from the local high street. This can result in the closure of specialist shops and services such as post office. The loss of local independent shops can cause problems in terms of access to food for older adults and those who do not have access to a car
- reduces choice; by dominating food sales, supermarkets take away choice from consumers
- negative impact on the local economy; independent shops are part of the local community and support the local economy whereas less money spent in supermarkets goes back into the local economy
- impact on quality of life for other businesses; small retailers often have to work long hours to compete with supermarkets
- impact on health; supermarket pricing policies may increase consumption of unhealthy food, leading to an increase in diet-related disorders

All other valid points will be given credit.

[20]

20

Specific Marking Instructions Q5 Option A

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they present arguments for and against the issue and make a convincing case for both sides of the argument.
- Assess the candidate’s QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the ‘best fit’ for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

Section B

60

Option A

85

Total

85

Section A

- 1 (a) Summarise the main principles of the EC regulation No. 852/2004 on the hygiene of foodstuffs. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of EC regulation No. 852/2004
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to summarise the main principles of this regulation
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: adequate

- adequate knowledge and understanding of EC regulation No. 852/2004
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to summarise the main principles of this regulation
- quality of written communication is adequate

Mark Band ([6]–[8])

Overall impression: competent

- competent knowledge and understanding of EC regulation No. 852/2004
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to summarise the main principles of this regulation
- quality of written communication is competent

Mark Band ([9]–[10])

Overall impression: highly competent

- highly competent knowledge and understanding of EC regulation No. 852/2004
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to summarise the main principles of this regulation
- quality of written communication is highly competent

Examples of suitable points to be summarised by the candidate:

- responsibility; primary responsibility for food safety rests with the food business operator. It is necessary to ensure food safety throughout the food chain, starting with primary production
- temperature; it is important for food that cannot be stored safely at ambient temperatures, particularly frozen food, to maintain the cold chain

- guide to good practice; general implementation of procedures based on the HACCP principles, together with the application of good hygiene practice should reinforce food business operators' responsibility
- risk assessment; it is necessary to establish microbiological criteria and temperature control requirements based on a scientific risk assessment
- imports; it is necessary to ensure that imported foods are of at least the same hygiene standard as food produced in the EC, or are of an equivalent standard

All other valid points will be given credit.

[10]

AVAILABLE
MARKS

Specific Marking Instructions Q1a Option B

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 in this question. Refer to descriptions of AOs on Page 2.
- The candidate should provide evidence of their ability to follow the command word summarise. Summarise suggests the need for a brief and straight to the point response. The key is to get all the main facts across in as succinct a manner as possible.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

- (b) Explain how the owner of a sandwich bar could prevent the risk of microbiological contamination from listeria. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of microbiological contamination from listeria
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how to prevent the risk of contamination from listeria
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of microbiological contamination from listeria
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how to prevent the risk of contamination from listeria
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of microbiological contamination from listeria
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how to prevent the risk of contamination from listeria
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of microbiological contamination from listeria
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how to prevent the risk of contamination from listeria
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- safety management plan; the food business should have a food safety management plan based on Hazard Analysis Critical Control Points (HACCP) principles in place to help reduce risk of contamination from listeria
- use reputable suppliers; the safety of raw ingredients and any ready-made products purchased should be a priority. Source reputable suppliers for foods commonly associated with listeria such as salads, soft cheeses (made from raw milk), cold cuts of meat and cooked seafood

- manage temperature control; use fridges and chilled display equipment properly to ensure food is kept at 5 °C or below. Cook-chill foods should not be stored for more than 5 days, the temperature of the chilled display equipment and fridges must be checked and recorded at least once per day
- food preparation; salads, fruit and raw vegetables should be washed thoroughly before serving. Wash hands, knives, and cutting boards after handling these foods or uncooked food to prevent cross contamination
- cooking of food; food should be thoroughly cooked, especially meat - cook through to the middle (core temperature of 75 °C). When heating food in a microwave follow heating and standing times recommended to diffuse cold spot; listeria may survive in food that has been cooked or reheated in a microwave because of uneven heating
- discarding food; keep foods for as short a time as possible and follow 'use by' and 'eat by' dates. Throw away left-over reheated food. Cooked food which is not eaten immediately should be cooled as rapidly as possible and then stored in the refrigerator
- cleaning; effective cleaning of the food preparation area and equipment is critical in removing listeria. Clean-as-you-go procedures should be established as well as end of production cleaning regimes to reduce accumulation of food residues. Use detergent to remove food residues and microbes before disinfecting

All other valid points will be given credit.

[15]

AVAILABLE
MARKS

25

Specific Marking Instructions Q1b Option B

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 in this question. Refer to descriptions of AOs on Page 2.
- The candidate should provide evidence of their ability to follow the command word explain. Explain means to clarify a topic so the candidate should demonstrate their ability to structure a clear and logically coherent response. QWC is important when judging responses to this question.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

Section A

25

Section B

AVAILABLE
MARKS

- 2 Discuss the possible theories for the increased incidence of food allergies.
(AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of food allergies
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the possible theories for the increased incidence of food allergies
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of food allergies
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the possible theories for the increased incidence of food allergies
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of food allergies
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss the possible theories for the increased incidence of food allergies
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of food allergies
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the possible theories for the increased incidence of food allergies
- quality of written communication is highly competent

Examples of suitable points to be suggested by the candidate:

- western diets; processed foods can be very high in additives and preservatives which may trigger reactions. In conjunction with this some consumers are eating less 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 an allergy. In some studies a diet low in oily fish has been associated with increased risk of childhood allergies

- breastfeeding; this is promoted as a possible way to prevent food allergies, breastfeeding for at least 4 months is needed for a good immune system. The antibodies of the mother are transferred to the infant and the immune system gets strengthened. Rates of breastfeeding are relatively low in modern society
- diet in pregnancy; pregnant and breastfeeding mothers are now encouraged to consume foods containing common allergens. If a fetus or a breastfed child comes into contact with the various foodstuffs, their tolerance for these foods may increase
- 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
- hygiene hypothesis; inadequate exposure to environmental micro-organisms (hypoallergenic baby food and increased hygiene standards) may result in the immune system of children developing a tendency towards allergy
- current environment; our environment today is very different from 50 years ago with higher rates of pollution which can stimulate the immune system. The increase in allergy mirrors the declining exposure to bacteria and other micro-organisms in our environment
- vaccines and antibiotics; they have defeated many infections. However, the cost of this may be a weakened immune system. This may be one of the factors why many people's immune systems are now reacting to allergens
- intestinal bacteria; an imbalance and change of the bacterial flora composition may have increased the incidence of food allergies. Intestinal bacteria in childhood play an important role in the development and function of the immune system in early life. Food allergy sufferers often have a malfunction of the immune system and a disturbed gut flora

All other valid points will be given credit.

[20]

20

Specific Marking Instructions Q2 Option B

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command word discuss. Look for an in-depth answer that shows reasoning skills and a wider engagement with the topic beyond an explanation.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

3 Evaluate the use of the following additives in food:

- colours
 - sweeteners
- (AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of colours and sweeteners
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to evaluate the use of colours and sweeteners in food
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of colours and sweeteners
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to evaluate the use of colours and sweeteners in food
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of colours and sweeteners
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to evaluate the use of colours and sweeteners in food
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of colours and sweeteners
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to evaluate the use of colours and sweeteners in food
- quality of written communication is highly competent

Examples of suitable points to be evaluated by the candidate:

Colours

Positive

- during the processing of some food colour can be lost so colour additives are used to restore or maintain the original colour, for example, canned peas or jams. These foods might otherwise be rejected by consumers
- colour additives can be used to make the existing food colour brighter and more appealing, e.g. custard

Negative

- brightly coloured 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

- six artificial food colours have been associated with hyperactivity or Attention Deficit Hyperactivity Disorder in children. Food and drink containing any of these six colours must carry a warning on the packaging
- some research suggests that eating or drinking particular mixes of colours together with the preservative sodium benzoate could be linked to a negative effect on children's behaviour
- allergic reactions to tartrazine and carmine have been reported occasionally in sensitive individuals. Symptoms include skin rashes, nasal congestion and hives. It has been suggested that sunset yellow and tartrazine should be avoided by anyone suffering from asthma or urticaria (a skin condition) as attacks can be triggered by these colours. Some synthetic dyes are thought to be carcinogens

Sweeteners

Positive

- useful alternative for people with diabetes who need to watch blood sugar levels while still enjoying their favourite foods. Sweeteners provide a sweet taste but unlike sugar they don't increase blood sugar levels
- both "bulk" and "intense" sweeteners impart a sweet taste to foodstuffs and are used in low-calorie products which may be of benefit to those who wish to control their weight

Negative

- there have long been concerns that the sweetener aspartame is linked to a raft of health problems. EFSA's opinion on aspartame's safety for human consumption remained unchanged after rigorous testing and EFSA reconfirmed the acceptable daily intake (ADI)
- ADIs for aspartame do not apply to people with phenylketonuria (PKU), a genetic disorder where the body cannot break down phenylalanine (by-product of aspartame). People with this condition need to closely monitor their phenylalanine intake
- some sweeteners such as sorbitol and xylitol can have a laxative effect. They can cause water retention in the intestine which can result in diarrhoea if consumed in large amounts

All other valid points will be given credit.

[20]

20

Specific Marking Instructions Q3 Option B

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command word evaluate. The candidate should provide information on both sides of the debate using evidence from a wide range of sources. The response could include the extent to which the candidate agrees with a particular use for an additive.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

4 Assess the possible risks to public health from the following heavy metals:

- mercury
- lead
- cadmium

(AO1, AO2, AO3)

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of mercury, lead and cadmium
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to assess the possible risks to health from the chemical contaminants
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of mercury, lead and cadmium
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to assess the possible risks to health from the chemical contaminants
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of mercury, lead and cadmium
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to assess the possible risks to health from the chemical contaminants
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of mercury, lead and cadmium
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to assess the possible risks to health from the chemical contaminants
- quality of written communication is highly competent

Examples of suitable points to be assessed by the candidate:**Mercury**

- risk assessment; EFSA recommends that each country considers its own patterns of fish consumption and assess the risk of exceeding safe levels of methylmercury while obtaining the health benefits of fish. This particularly applies to countries where fish with a high mercury content – such as swordfish, pike, tuna and hake – are consumed regularly
- risk to public health; all humans are exposed to some level of mercury. Most

people are exposed to low levels of mercury without any obvious health risks. However some people are regularly exposed to high levels of mercury because they rely on subsistence fishing. Among these populations between 1.5/1000 and 17/1000 children showed cognitive impairment caused by the consumption of fish containing mercury

- risk to public health; shark, swordfish and marlin should not be eaten during pregnancy or when trying to conceive. They contain more methylmercury than other types of fish, and can damage a developing baby's nervous system and brain. All other adults, including breastfeeding women, should eat no more than one portion per week

Lead

- risk assessment; EFSA considers cereals, vegetables and tap water to contribute most to dietary exposure to lead for most Europeans. Current levels of exposure to lead pose a low to negligible health risk for most adults but there is potential concern over possible neurodevelopmental effects in foetuses, infants and children
- risk to public health; exposure during pregnancy to high levels of lead can cause miscarriage, stillbirth, premature birth and low birth weight, as well as minor malformations. The body stores lead in the teeth and bones where it accumulates over time. Lead stored in bone may be remobilised into the blood during pregnancy, thus exposing the foetus
- risk to public health; particularly vulnerable to the toxic effects of lead and can suffer permanent adverse health effects affecting the development of the brain and nervous system. Therefore, maximum limits for lead in infant formulae are strictly controlled
- risk to public health; risks are low to negligible for most adults although long-term exposure can cause cardiovascular effects, anaemia, lethargy, kidney or liver damage, high blood pressure

Cadmium

- risk assessment; food stuffs are the main source of exposure however levels consumed by most people are not considered to be a major health concern
- risk to public health; cadmium absorption after dietary exposure in humans is relatively low (3–5%) but it is efficiently retained in the kidneys resulting in kidney damage. Cadmium is primarily toxic to the kidneys, especially to the tubular cells where it accumulates over time and may cause renal dysfunction
- risk to public health; The International Agency for the Research on Cancer classified cadmium and its compounds as being carcinogenic in humans. Breathing cadmium in the air can cause lung cancer, although ingesting cadmium via food is not believed to increase the risk of cancer

All other valid points will be given credit.

[20]

20

Specific Marking Instructions Q4 Option B

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command word assess. The candidate is expected to make an informed judgement about the possible risks to public health from the listed heavy metals. They should weigh all views and support them with evidence.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

AVAILABLE
MARKS

- 5 Food safety is a shared responsibility throughout the food chain. Discuss the role farmers must play to ensure food safety. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([1]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the role farmers must play to ensure food safety
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss this role
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the role farmers must play to ensure food safety
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss this role
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the role farmers must play to ensure food safety
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss this role
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the role farmers must play to ensure food safety
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss this role
- quality of written communication is highly competent

Examples of suitable points to be discussed by the candidate:

- responsible role; farmers are at the beginning of the food chain and as such have responsibility for farm hygiene and safe farm management to control potential food hazards at farm level
- good practices; farmers have responsibility for good farming practices including keeping good records showing the steps they take to ensure food safety including traceability of inputs purchased, traceability of outputs sold, veterinary products administered to animals including dates of administration and withdrawal, the occurrence of disease or pests that may affect food safety, the use of any plant protection and results of any relevant tests carried out
- controlling pathogens; farms have many sources of pathogens which must be managed by the farmer. For example, they must maintain high standards of hygiene in relation to facilities, equipment and vehicles. Farm manures

must be managed to reduce the risk of contaminating crops with pathogenic microorganisms such as E.coli, salmonella, listeria and campylobacter

- controlling chemical contamination; farmers use chemicals such as pesticides on crops and medicines for animals. The farmer must take steps to ensure these chemicals are used in a safe, responsible and effective way in accordance with instructions and regulations
- managing animals; farm animals are a source of bacteria and disease which can be passed into the food chain. Looking after animals properly and monitoring them regularly for signs of illness are the best ways of preventing disease and controlling its spread
- managing animal feed; animals reared for human consumption can become contaminated through their feed. For this reason, farmers must store and handle animal feed to prevent hazardous contamination. They must also ensure that feeds can be traced in the event of a safety incident
- cooperation; farmers must cooperate with DAERA in relation to official controls such as inspections, audits and testing. They must be familiar with and follow legislation such as Food Hygiene Regulations (NI) 2006 for Primary Producers and the Welfare of Animals Act NI (2011)
- support; farmers are supported in their role. DAERA make farmers aware of their legal responsibilities and provide guidance on complying with the regulations. Quality Assurance Schemes help farmers with guarantees that food has been produced to particular standards
- key role; increased consumer interest in the origins and traceability of their food means farmers have a key role in building consumer confidence of the safety of their food

All other valid points will be given credit.

[20]

AVAILABLE MARKS

20

Specific Marking Instructions Q5 Option B

- Responses should provide evidence of all 3 AOs. However, there is a heavier weighting for AO2 and AO3 in this question. Refer to descriptions of AOs on Page 2.
- The candidate can provide evidence of AO3 if they follow the command word discuss. Look for an in-depth answer that shows reasoning skills and a wider engagement with the topic beyond an explanation.
- Assess the candidate's QWC using the detailed guidance on Page 3.
- When you have decided which mark band is the 'best fit' for the response, use the levels of response on Page 3 to identify a final mark.
- Remember that the list of suitable points are examples only. The list is not prescriptive, and candidates should not be penalised for omissions. Refer to the general marking instructions on Page 2 for further guidance.

Section B

60

Option B

85

Total

85