



General Certificate of Education
2019

Nutrition and Food Science

Assessment Unit A2 1

assessing

Option A: Food Security and Sustainability

Option B: Food Safety and Quality

[ANF11]

TUESDAY 4 JUNE, MORNING

**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.

Option A: Food Security and Sustainability

AVAILABLE
MARKS

Section A

1 (a) Explain how choosing foods with the following labels could help the environment:

- Marine Stewardship Council
 - Conservation Grade
- (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of the Marine Stewardship Council and the Conservation Grade
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how choosing foods with Marine Stewardship Council and the Conservation Grade labels could help the environment
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: adequate

- adequate knowledge and understanding of the Marine Stewardship Council and the Conservation Grade
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how choosing foods with Marine Stewardship Council and the Conservation Grade labels could help the environment
- quality of written communication is adequate

Mark Band ([6]–[8])

Overall impression: competent

- competent knowledge and understanding of the Marine Stewardship Council and the Conservation Grade
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how choosing foods with Marine Stewardship Council and the Conservation Grade labels could help the environment
- quality of written communication is competent

Mark Band ([9]–[10])

Overall impression: highly competent

- highly competent knowledge and understanding of the Marine Stewardship Council and the Conservation Grade
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how choosing foods with Marine Stewardship Council and the Conservation Grade labels could help the environment
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

AVAILABLE
MARKS

Marine Stewardship Council (MSC)

- choosing the MSC label protects marine environment, marine habitats and ecosystems remain healthy
- supporting certified sustainable fisheries whose good management helps ensure fish stocks and habitats are healthy
- helps maintain sustainable fish stock levels for the future
- MSC certified dredge fisheries have taken measures to minimise the impact on seabed habitats

Conservation Grade

- choosing Fair to Nature brands help to reverse the decline in wildlife
- Fair to Nature principles support biodiversity, healthy biodiversity promotes pollution breakdown and absorption and can contribute to climate stability
- Conservation Grade accredited farmers must adhere to a protocol which prohibit the use of certain agrochemicals
- Fair to Nature farms contribute at least 10% of the area they farm into pollen and nectar habitats, wild bird food crops and other habitats such as hedges, ponds and woodland
- protecting water bodies from agricultural inputs is a high priority for Conservation Grade

All other valid points will be given credit.

[10]

- (b) Discuss the benefits of buying local food for the consumer, the community and the environment. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the benefits of buying local food
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the benefits of buying local food for the consumer, the community and the environment
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of the benefits of buying local food
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the benefits of buying local food for the consumer, the community and the environment
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of the benefits of buying local food
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question

- demonstrates a competent ability to discuss the benefits of buying local food for the consumer, the community and the environment
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of the benefits of buying local food
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the benefits of buying local food for the consumer, the community and the environment
- quality of written communication is highly competent

Examples of suitable points to be discussed by the candidate:

Benefits for the consumer

- encourages a varied diet of fresh food; buying local means eating with the seasons, eating foods at their peak taste and nutritional value, when they are abundant and consequently at their least expensive
- greater transparency of how food is produced; being able to directly ask questions about how produce is grown and produced enables the consumer to make an informed decision about whether these methods align with their beliefs about, for example use of preservatives

Benefits for the community

- reconnects communities with farmers and local food producers; agricultural businesses are key parts of the rural economy and farm shops can improve the farmer’s local identity
- creates jobs and supports local economies; if food producers deal directly with the consumer they may be receiving a fair price for their produce; money spent on local produce stays in the community to be re-invested in the local economy
- revitalises town centres and high streets; farmers’ markets and butchers/fishmongers can increase footfall to town centres

Benefits for the environment

- reduces traffic congestion, noise and pollution from food miles; buying local over time, may alleviate the need for supermarkets to routinely transport goods over long distances, reducing the greenhouse gas emissions from planes, trains, ships and lorries
- encourages sustainability; the majority of food producers who sell at farmers’ markets use more environmentally friendly farming systems or they farm organically
- reduces greenhouse gas emissions; does not require energy-intensive conditions such as heated greenhouses and reduces the likelihood of energy-intensive methods of storage and transport
- reduces packaging; 95% of food is over-packaged using non-environmental friendly plastic packaging materials; most locally produced food is available to be selected by hand and with minimum packaging

All other valid points will be given credit.

[15]

**AVAILABLE
MARKS**

25

Section A

25

Section B

**AVAILABLE
MARKS**

- 2 Explain how climate change and intensive farming can threaten food security. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of climate change and intensive farming
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how climate change and intensive farming can threaten food security
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of climate change and intensive farming
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how climate change and intensive farming can threaten food security
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of climate change and intensive farming
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how climate change and intensive farming can threaten food security
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of climate change and intensive farming
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how climate change and intensive farming can threaten food security
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

Climate change

- impact on yield; climate change increases the frequency of drought, floods and storms. They have an adverse impact on food security through their potential to reduce crop yield and livestock production and fish species
- nutritional content; elevated levels of CO₂ reduce the nutritional content of grains, tubers and legumes affecting key nutrients such as zinc and iron

- impact on food production; climate change can alter the distribution and severity of pests and diseases in crops and livestock; this has the potential for severe impacts on food production
- food availability; loss of yield leads to food price spikes; rising prices of staple foods forces people into poverty

Intensive farming

- land degradation; intensive farming reduces soil fertility and over-exploits the water table, overall reducing the ability of the land to grow crops in the future
- flooding: degraded lands are also less able to hold on to water which can worsen flooding, destroying crops and reducing yield
- over grazing; leads to soil erosion and loss of valuable native species of plants whose roots can be damaged when repeatedly trampled on by large livestock
- soil erosion; means a volume of soil is carried away reducing land for crop growth, also leads to increased pollution and sedimentation in rivers and streams, causing declines in fish and other species
- cultivating monocultures; cultivating a single type of plant increases yield for the farmer but it damages biodiversity and soil quality. Lack of biodiversity results in insufficient nutrients in the soil leading to increased use of synthetic herbicides and fertilizers which leach into the soil eventually polluting groundwater supplies

All other valid points will be given credit.

[20]

20

AVAILABLE
MARKS

- 3 Suggest possible reasons for food poverty in the UK and describe the consequences for those who cannot afford to buy food. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of food poverty in the UK
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to suggest possible reasons for food poverty in the UK
- demonstrates a limited ability to describe the consequences for those who cannot afford to buy food
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of food poverty in the UK
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to suggest possible reasons for food poverty in the UK
- demonstrates an adequate ability to describe the consequences for those who cannot afford to buy food
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of food poverty in the UK
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to suggest possible reasons for food poverty in the UK
- demonstrates a competent ability to describe the consequences for those who cannot afford to buy food
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of food poverty in the UK
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to suggest possible reasons for food poverty in the UK
- demonstrates a highly competent ability to describe the consequences for those who cannot afford to buy food
- quality of written communication is highly competent

Examples of suitable points to be suggested and described by the candidate:

Possible reasons for food poverty

- living costs; rising living costs have placed a strain on incomes since the recession, greatly reducing the purchasing power of many households

- especially those at the lower end of the income scale
- food costs; UK food prices have increased and those experiencing food poverty now buy cheaper, lower quality food and spend less on fresh fruit and vegetables, meat and fish
- housing; low levels of house building in the social housing sector has resulted in rising numbers of families living in expensive rented accommodation while they wait to be housed
- energy; energy prices have risen leaving less income for food in many households
- static incomes; UK weekly earnings have fallen in real terms which means households have less money to meet costs. The National Minimum Wage is still well below the cost of living
- insecure contracts; some jobs are on insecure contracts with minimal rights for workers, these workers are often low paid and unable to sustain long-term employment
- social security reform; the changes to the social security system brought about through the Welfare Reform Act 2012 have had significant financial impact on low-income households

Consequences for those who cannot afford to buy food

- healthy diet; less likely to eat fresh fish, meat, fruit and vegetables on a daily basis and as a result children are more likely to suffer from short and long-term nutrition-related illnesses
- skipping meals; parents may go without food to feed their children and pay bills; children may miss breakfast
- poverty trap; less nutritious food can affect the future income for children, condemning them to a life of poverty and hunger

All other valid points will be given credit.

[20]

20

- 4 Discuss the potential barriers which may prevent consumers from making sustainable food choices. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the potential barriers which may prevent consumers from making sustainable food choices
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss these barriers
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the potential barriers which may prevent consumers from making sustainable food choices
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss these barriers
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the potential barriers which may prevent consumers from making sustainable food choices
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss these barriers
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the potential barriers which may prevent consumers from making sustainable food choices
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss these barriers
- quality of written communication is highly competent

Examples of suitable points to be discussed by the candidate:

- cost; cost of food is an important determinant of food choice for most consumers. Consumers often perceive sustainable products as more expensive such as organic fruit and vegetables or grass-fed beef and lamb
- availability; green purchases will not happen without easy access for consumers
- sustainable food labelling; this needs to be clear to consumers to enable them to make sustainable choices, they need to be aware of the label, its meaning and find it credible
- psychological determinants such as mood, stress and guilt; food choice is influenced by a number of factors, even if the consumer has a basically positive attitude to sustainability, this may not translate into the motivation to choose sustainably at the point of purchase
- confusion and lack of trust; confusion about the implications of their choices may be a barrier, information is often contradictory and overwhelming which

can result in consumers unable to act on their environmental concerns at point of purchase. Consumers may also be concerned that large food companies are guilty of 'greenwashing' as a marketing ploy rather than a genuine sustainable choice

- low levels of awareness; this relates particularly to the issue of the impact of their purchases on food security, for example supporting Fairtrade
- physical determinants such as access, education, skills and time; consumers perceive a sustainable diet such as one using fresh food to take longer to consider, prepare and cook which may not fit into their busy lifestyle
- social determinants such as culture, family, peers and meal patterns; cultural influences play a significant role in food choice through the habitual consumption of certain foods, preparation traditions and religious restrictions. Social influences can be strong and can impact on sustainable food choices. Meal patterns including eating out can restrict sustainable food choices

All other valid points will be given credit.

[20]

AVAILABLE
MARKS

20

- 5 Explain why consumers waste food and outline the environmental consequences of such waste. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the issue of food waste
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain why consumers waste food
- demonstrates a limited ability to outline the environmental consequences of such waste
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the issue of food waste
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain why consumers waste food
- demonstrates an adequate ability to outline the environmental consequences of such waste
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the issue of food waste
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain why consumers waste food
- demonstrates a competent ability to outline the environmental consequences of such waste
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the issue of food waste
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain why consumers waste food
- demonstrates a highly competent ability to outline the environmental consequences of such waste
- quality of written communication is highly competent

Examples of suitable points to be explained and outlined by the candidate:**Why consumers waste food**

- over-stocking; consumers buy too much for a variety of reasons such as temptation of multipack offers and buy one get one free deals; online shopping encourages consumers to repeat the previous week's list rather than check what is needed
- poor storage management; not eating food in date order; not reading storage advice on packaging
- high sensitivity to food hygiene; over-zealous food hygiene practices and reactions to best-before dates rather than checking the food

- misjudged portion sizes; result in cooking, preparing and serving too much food
- dislike of food prepared; families with children often report that children not liking the dish prepared is a source of food waste
- poor awareness of the issue; lack of appreciation of the implications of food waste and the processing techniques which cause the most waste can lead to wasteful behaviours
- lifestyle; factors such as not having the time to plan meals can lead to over-stocking and impulse buying
- knowledge; limited knowledge of stock-rotation, cooking with leftovers, using food near or past its best
- attitudes; many consumers can afford to waste food

Environmental consequences

- carbon dioxide; the energy costs of producing, packaging and transporting food produces carbon dioxide and when food is discarded, this energy is not recovered, giving off carbon dioxide that could have been avoided. Carbon dioxide is a greenhouse gas contributing to climate change and its effects such as extreme weather and rising seas
- methane; food waste ends up in landfill where it decays and produces the greenhouse gas methane.
- water; a huge amount of water is used to produce the food that consumers waste. The world is facing a water shortage as a result of population growth, climate change and shifting consumption patterns

All other valid points will be given credit.

[20]

AVAILABLE MARKS

20

Section B

60

Total

85

Section A

- 1 (a) Outline the possible risks associated with preservatives in food. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of risks associated with preservatives in food
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to outline these risks
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: adequate

- adequate knowledge and understanding of risks associated with preservatives in food
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to outline these risks
- quality of written communication is adequate

Mark Band ([6]–[8])

Overall impression: competent

- competent knowledge and understanding of risks associated with preservatives in food
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to outline these risks
- quality of written communication is competent

Mark Band ([9]–[10])

Overall impression: highly competent

- highly competent knowledge and understanding of risks associated with preservatives in food
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to outline these risks
- quality of written communication is highly competent

Examples of suitable points to be outlined by the candidate:

- cancer; when sodium benzoate is mixed with the additive vitamin C in soft drinks, it creates benzene, a carcinogenic substance. There are issues surrounding sodium nitrate used as a preservative in bacon, processed meat and smoked foods as there is evidence linking it to cancer
- hyperactivity in children; mixes of certain preservatives used in food and drinks together with some colours are associated with hyperactivity in some children
- neurodegenerative diseases; sodium benzoate may cause damage

to the mitochondria, an important area of DNA; diseases such as Parkinson's and ageing are now being linked to this damage

- allergy; rare to have an allergic reaction to food additives. However, certain preservatives may cause a flare-up of symptoms in people with pre-existing conditions. Sulphur dioxide and other sulphites used as preservatives in a wide range of food have been implicated
- asthma; benzoates could make the symptoms of asthma and eczema worse in children who already have these conditions

All other valid points will be given credit.

[10]

- (b) Describe the role of the European Food Safety Authority (EFSA) in ensuring food additives are safe. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the role of the EFSA
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe the role of the European Food Safety Authority (EFSA) in ensuring food additives are safe
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of the role of the EFSA
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe the role of the European Food Safety Authority (EFSA) in ensuring food additives are safe
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of the role of the EFSA
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe the role of the European Food Safety Authority (EFSA) in ensuring food additives are safe
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of the role of the EFSA
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe the role of the European Food Safety Authority (EFSA) in ensuring food additives are safe
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- authorisation; under EU legislation, all food additives must be authorised before they can be used in food. EFSA will only authorise a

food additive if its use meets the following conditions: it does not pose risks to the health of the consumer at the level of the proposed use; there is a reasonable technological need that cannot be achieved by other means; its use does not mislead and must have benefits for the consumer

- safety evaluation; EFSA evaluates additives based on a dossier, usually provided by an applicant (producer or user of the food additive). This dossier must contain the chemical identifications of the additive, its manufacturing process, the case of need, the proposed uses and toxicological data. Based on this data, EFSA determines the level below which the intake of the substance can be considered safe – the so-called Acceptable Daily Intake (ADI)
- Acceptable Daily Intake; EFSA seeks to establish an Acceptable Daily Intake (ADI) for each substance. The ADI is the amount of a substance that people can consume on a daily basis during their whole life without any appreciable health risk
- re-evaluation; the EC has tasked EFSA to systematically re-evaluate all authorised food additives in the EU starting with colours. This is in the interest of consumer protection, taking account of new research since the original assessments were carried out many years ago
- ad hoc requests; food safety is constantly evolving and so EFSA must respond to impromptu requests from the EC to review certain food additives in the light of new scientific information and/or changing conditions of use
- allergies; consideration as to whether certain food colours are likely to trigger adverse allergic reactions is carried out by EFSA’s Panel on Dietetic Products, Nutrition and Allergies (NDA). They deal with questions related to dietetic products, nutrition and food allergies

All other valid points will be given credit.

[15]

Section A

**AVAILABLE
MARKS**

25

25

Section B

AVAILABLE
MARKS

2 Discuss current global food safety challenges. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of global food safety challenges demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss these challenges
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of global food safety challenges
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss these challenges
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of global food safety challenges
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss these challenges
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of global food safety challenges
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss these challenges
- quality of written communication is highly competent

Examples of suitable points to be suggested by the candidate:

- poverty; people living in poverty are the most exposed to food-borne health risks. For many living at or below the poverty line, food-borne illness perpetuates the cycle of poverty
- demographic and environmental developments; an ageing population, increasing migration, emergencies are putting more people at risk. Older people are particularly at risk of contracting and dying from common food-related diseases
- changing lifestyles; urbanisation, travel, eating more food outside the home and new food trends are also increasing exposure to the risk of food-borne disease
- globalisation; allows for a wider variety of food available to consumers. However the food chain becomes longer and more complex, creating an environment where known and new food-borne diseases, hazards and risks may spread more easily, and facilitates the long-distance transmission of pathogens

- antimicrobial resistance; an increasing public health problem. In EU countries, for example, salmonella and campylobacter show significant levels of resistance to common antimicrobials used in humans and animals
- population growth; as the world's population grows, the intensification and industrialisation of agriculture and animal production to meet increasing demand for food creates both opportunities and challenges for food safety
- climate; changes in climate are predicted to impact on food safety. Temperature changes increase food safety risks associated with food production, storage and distribution
- food integrity; due to globalisation of the food supply chains, the ability for fraudulent activity to be undertaken has risen greatly leading to a significant risk to public safety, e.g. recycling of animal by-products back into the food chain; packing and selling of meat with unknown origin
- environmental pollution; Persistent Organic Pollutants (POPs) accumulate in animal food chains, microplastics and microbeads are polluting the world's seas, consumed by marine creatures and get into the food chain which impacts on human health

All other valid points will be given credit.

[20]

20

AVAILABLE
MARKS

- 3 Explain the work of the Environmental Health Practitioner (EHP) in relation to food safety and port health. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the work of the EHP
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the work of the EHP in relation to food safety and port health
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the work of the EHP
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain the work of the EHP in relation to food safety and port health
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the work of the EHP
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain the work of the EHP's in relation to food safety and port health
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the work of the EHP
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain the work of the EHP in relation to food safety and port health
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:**Food Safety**

- food registration; registration of premises used for a food business is required by law. It provides EHPs with information about the food premises in their area so they can plan inspections and target enforcement resources effectively
- inspections; the 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. 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. Informal action usually involves a written or verbal warning. Formal action is reserved for serious cases of poor food hygiene, the EHP will arrange for legal proceedings to be taken against the offender which may be a formal warning or prosecution in court

- advice; rather than enforce the law, EHPs prefer food handlers to be made aware of their responsibilities and their rights with regard to food safety. EHPs may run courses on food safety and organise specialised lectures for personnel working in the food industry
- 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
- Food Hygiene Rating Scheme; The Food Hygiene Rating Act (Northern Ireland) 2016 is operated by EHPs in partnership with the Food Standard Agency. Food premises are inspected by EHPs to check that the hygiene standards meet legal requirements and cover areas such as: how hygienically food is handled; the condition of the structure of the buildings and how the business manages and records what it does to make sure food is safe. This helps consumers make an informed choice; businesses are required to display a sticker with their food hygiene rating
- infectious diseases; if a consumer has food poisoning or a food related illness they can contact the EHP for advice. As well as investigating notifications of infectious diseases (particularly food poisoning) from the general public, they also investigate notifications from GPs, businesses and other local authorities

Port health

- environmental health standards; EHPs are responsible for making sure the port meets the stipulated health standards. They do this by monitoring the port for infectious diseases and check the port for signs of pests
- inspections; these are carried out on board ships and other vessels to check they comply with food safety and hygiene standards. They also analyse the quality of water provided to, and stored on ships
- issuing ship sanitation and exemption certificates; under the International Health Regulations 2005 all ships and other vessels engaged in an international voyage between countries must hold a valid ship sanitation certificate

All other valid points will be given credit.

[20]

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4 Assess the potential risks to food safety from veterinary medicines and animal feed. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the potential risks to food safety from veterinary medicines and animal feed
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to assess these risks
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the potential risks to food safety from veterinary medicines and animal feed
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to assess these risks
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the potential risks to food safety from veterinary medicines and animal feed
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to assess these risks
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the potential risks to food safety from veterinary medicines and animal feed
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to assess risks to assess these risks
- quality of written communication is highly competent

Examples of suitable points to be assessed by the candidate:

Veterinary Medicines

- regulation; veterinary medicine residues are regulated to ensure that they do not present health risks to people who eat meat and animal products. All veterinary medicines must be authorised before they can be used in the UK. Surveillance programmes monitor veterinary residues to ensure that no unexpected residues are occurring and to provide an extra check that veterinary medicine residues do not harm people's health
- residues; of veterinary medicines are rarely found and, where residues do occur, they are almost always at low levels that are not a threat to food safety health. Withdrawal periods are an added safety measure to ensure residues do not exceed legal limits and provides an assurance of public safety

- limits; consuming small amounts of veterinary medicine residues in a diet poses no risk, provided that the amount consumed is below the safety limit set (called a Maximum Residue Limit – MRL). These legal limits represent the maximum amount of the veterinary medicine that is safely and legally permitted. However, possible reasons for exceeding MLRs include: not following recommended label directions or dosage; not adhering to recommended withdrawal times and use of drug-contaminated equipment

Animal Feed

- mycotoxins; EFSA have carried out risk assessments on mycotoxins in animal feed that are considered to pose a potential risk to human health. Overall food of animal origin only contributes marginally to the total human exposure to mycotoxins
- prions; strict controls have been in place since 1996 to prevent Bovine spongiform encephalopathy BSE (a prion disease in cattle) entering the human food chain and the use of meat-and-bone mix has since been outlawed. Experts believe that the food controls have worked and there have been few reported cases
- dioxins; in many instances dioxin contamination is introduced to food via contaminated animal feed. Many countries monitor their food supply for dioxins. This has led to early detection and has often prevented impact on a larger scale
- microbiological contamination; animal feeds are a source of bacteria, including salmonella, campylobacter and E. coli, which can contaminate poultry and other farm animals. There are statutory and non-statutory guidelines applicable to all feed business operators for establishing good production practices to safeguard the microbiological quality of feed materials
- controls; businesses that use, manufacture or sell animal feed must be registered or approved, and comply with specified standards in respect of their facilities, storage, personnel and record-keeping. This includes farmers feeding animals producing food for human consumption and arable farms growing crops for feed use. ‘Farm to fork’ approach ensures food safety throughout the food chain starting with primary production which minimises the potential risk to food safety

All other valid points will be given credit.

[20]

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AVAILABLE
MARKS

5 Explain how consumers can reduce the risk of microbial contamination from the following foods:

- poultry
- eggs
- shellfish
- fruit and vegetables

(AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of microbial contamination
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how consumers can reduce the risk of microbial contamination when handling the foods listed
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of microbial contamination
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how consumers can reduce the risk of microbial contamination when handling the foods listed
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of microbial contamination
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how consumers can reduce the risk of microbial contamination when handling the foods listed
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of microbial contamination
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how consumers can reduce the risk of microbial contamination when handling the foods listed
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

Poultry

- purchase; pack raw poultry separately from ready-to-eat foods to avoid cross-contamination. Purchase the raw poultry at end of shopping trip, cool bags will help with temperature control and avoid the temperature danger zone
- storage; to prevent cross-contamination store raw poultry and ready-to-eat foods separately, place in sealable containers at the bottom of fridge. Keep poultry in the fridge, 5°C or less. Avoid 'the danger zone' when bacteria can multiply

- preparation; campylobacter can last on kitchen surfaces for up to 1 hour and E. coli can last for up to 24 hours – good practice to wash cutting boards, knives and other utensils with hot soapy water immediately after preparing raw poultry or use a different board for raw poultry. Do not wash raw poultry – this may splash harmful bacteria around the kitchen. Defrost poultry in the fridge. Poultry must be cooked to a core temperature of at least 70°C for 2 minutes

Eggs

- purchase; try to buy quality assured eggs; British Lion Brand flocks are vaccinated against salmonella. Select those with the longest date mark
- storage; place in the fridge or in a cool, dry place. If in the fridge use the egg tray, this helps to keep eggs separate from other ready-to-eat foods and avoid cross-contamination, alternatively keep them in their carton. Discard after the use-by date.
- cooking; when handling eggs, always make sure that hands, surfaces and utensils that come into contact with raw egg or shells are washed thoroughly

Shellfish

- purchase; buying from reputable sources. When shopping, pick up shellfish last and take it straight home
- storage; place in the fridge as soon as possible which will prevent them from decomposing and producing histamines which cause food poisoning. Don't store shellfish in water, they will drown and become unsafe. Discard live shellfish if their shell has a crack or break, or if the shells are open and don't close when tapped – indicates high risk
- preparation; wash hands thoroughly before and after handling shellfish. Don't allow the shellfish or fluid from them to come into contact with cooked or ready-to-eat food. The Food Standards Agency (FSA) advises that older people, pregnant women, very young children and people who are unwell should avoid eating raw or lightly cooked shellfish

Fruit and Vegetables

- storage; soiled vegetables should be kept away from other produce to avoid cross-contamination. When salad vegetables have been washed and rinsed keep in a clean container with a lid. Store away from other raw foods, not below meat in the fridge where juices may drip. Always wash hands before touching salads or fresh fruit to avoid passing on bacteria
- preparation; fruit and vegetables that are not ready-to-eat require adequate washing and/or processing treatment (for example peeling or cooking). Soil where fresh produce grows can become contaminated with bacteria such as E. coli. Root crops and leafy vegetables sold loose are likely to have the most soil on the outside. Disinfect any food sink after washing root vegetables and before using for salad items

All other valid points will be given credit.

[20]

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Section B

60

Total

85

**AVAILABLE
MARKS**