



Rewarding Learning

**General Certificate of Education
2022**

Nutrition and Food Science

Assessment Unit A2 1

assessing

OPTION A: Food Security and Sustainability

OPTION B: Food Safety and Quality

[ANF11]

WEDNESDAY 15 JUNE, AFTERNOON

**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.

COVID-19 Context

Given the unprecedented circumstances presented by the COVID-19 public health crisis, senior examiners, under the instruction of CCEA awarding organisation, are required to train assistant examiners to apply the mark scheme in case of disrupted learning and lost teaching time. The interpretation and intended application of the mark scheme for this examination series will be communicated through the standardising meeting by the Chief or Principal Examiner and will be monitored through the supervision period. This paragraph will apply to examination series in 2021–2022 only.

Option A: Food Security and Sustainability

AVAILABLE
MARKS

Section A

- 1 (a) Describe the impact of animal farming on water quality and soil health. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of the impact of animal farming on water quality and soil health
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe the impact of animal farming on water quality and soil health
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: adequate

- adequate knowledge and understanding of the impact of animal farming on water quality and soil health
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe the impact of animal farming on water quality and soil health
- quality of written communication is adequate

Mark Band ([6]–[8])

Overall impression: competent

- competent knowledge and understanding of the impact of animal farming on water quality and soil health
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe the impact of animal farming on water quality and soil health
- quality of written communication is competent

Mark Band ([9]–[10])

Overall impression: highly competent

- highly competent knowledge and understanding of the impact of animal farming on water quality and soil health
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe the impact of animal farming on water quality and soil health
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

- water pollution from animal waste; animal waste from farming is usually put into a pit to be later disposed of. Animal waste in these pits can both damage water and soil through run-off and leaks. Nitrogen from the waste causes both eutrophication and oxygen depletion in water, damaging biodiversity and killing fish. In addition to nitrogen, animal waste can also pollute water with both pathogens (such as salmonella and E coli), antibiotics and hormones, heavy metals and sediments (through soil erosion)

- water pollution from artificial fertilisers; artificial fertilisers are applied to crops mostly grown for animal feed. Rain washes nutrients from these fertilisers into local rivers and streams causing eutrophication of ecosystems
- water pollution from veterinary antibiotics; in intensive farming, antibiotics are used for disease suppression and growth enhancement. Scientific studies suggest that 75-90% of antibiotics are excreted from animals unmetabolised and enter water sources
- water usage; livestock production uses 15% of all irrigated water globally. Around 2 billion people currently suffer from water scarcity, with this figure set to increase to between 4 and 7 billion by 2050 – more than half of the projected world population. The water used by livestock production is projected to increase by 50 per cent by 2025
- soil compaction; increased soil compaction is one of the key issues affecting soil health in the UK and NI and is caused in part by overstocking of animals. This prevents root development, limits nutrient and water uptake, and increases the risk of waterlogging in winter
- soil erosion; overgrazing can lead to soil erosion by removing the ground cover (the grasses) exposing the soil to wind and water erosion. The removal of the ground cover also can hasten drying destroying the organic matter, and ruining the soil structure - making it easier for the soil to erode

All other valid points will be given credit.

[10]

- (b) Explain how the Linking Environment and Farming (LEAF) organisation is helping to deliver more sustainable food choices for the consumer. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of LEAF
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how LEAF is helping to deliver more sustainable food choices for the consumer
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of LEAF
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how LEAF is helping to deliver more sustainable food choices for the consumer
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of LEAF
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how LEAF is helping to deliver more sustainable food choices for the consumer
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of LEAF
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how LEAF is helping to deliver more sustainable food choices for the consumer
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- Integrated Farm Management; LEAF help farmers produce good food, with care and to high environmental standards through Integrated Farm Management (IFM). IFM supports the conservation and improvement of soil; the use of pest control measures that have minimal impact on the environment and human health; effective water management; reduced reliance on fossil fuels; pollution control; animal welfare and conservation of the landscape and wildlife
- support for producers; LEAF provide a range of services for farmers for example, a booklet as a guide for members which goes through the key principles of each section of IFM and the benefits of following an integrated approach; a self-assessment on-line management tool, based on IFM, to help farmer members monitor their performance, identify strengths and weaknesses and set targets for improvements across the whole farm. They keep members informed about the latest research and practices in IFM
- LEAF Marque; LEAF provide a robust, transparent and credible global assurance system as recognised by full membership of the ISEAL Alliance. It stands for more environmental sustainability and is held by farm businesses which meet their rigorous standards of sustainable farming practice. LEAF Marque certified businesses have been independently verified against the robust LEAF Marque Standard
- raise consumer awareness; the LEAF Marque certification assures consumers that food has been environmentally sustainably produced and empowers consumers to make positive changes through their purchasing decisions. LEAF encourage farmers to communicate what they are doing and why to everybody who works on or around the farm, including the local community to help them understand farming and the rural environment and address their concerns, needs and expectations of the countryside and food production for example, farmers at LEAF Demonstration Farms communicate, discuss and demonstrate IFM best practice amongst other farmers and also play a critical role in promoting sustainable farming to wider groups such as politicians, industry and students
- LEAF education; the aim is to inspire and educate future generations about farming, food and the countryside to help them make informed decisions about food. LEAF provide resources for schools and provided training for farmers to enable them to communicate and educate through initiatives such as farm visits of ‘Facetime a Farmer’

All other valid points will be given credit.

[15]

25

Section A

25

AVAILABLE
MARKS

Section B

**AVAILABLE
MARKS**

- 2 Discuss the suggestion that consumers can protect the environment by changing their food choices. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of how consumers could protect the environment by changing their food choices
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the proposal that consumers can protect the environment by changing their food choices
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of how consumers could protect the environment by changing their food choices
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the proposal that consumers can protect the environment by changing their food choices
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of how consumers could protect the environment by changing their food choices
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss the proposal that consumers can protect the environment by changing their food choices
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of how consumers could protect the environment by changing their food choices
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the proposal that consumers can protect the environment by changing their food choices
- quality of written communication is highly competent

Examples of suitable points to be discussed by the candidate:

Eat better quality and less meat and dairy produce

- animal farming globally is the biggest contributor to greenhouse gas emissions caused by the food system, which itself is responsible for up to 30% of all global emissions
- livestock emit high levels of methane, a potent greenhouse gas

- natural 'carbon sinks' such as forests, that absorb greenhouse gases, are destroyed to make way for animal grazing or crops for animal feed
- animal feed is usually produced using nitrogen fertilisers which are energy intensive to create and result in emissions of the greenhouse gas, nitrous oxide
- animals, their feed and resulting animal products are usually transported, often over large distances, and in energy-intensive refrigerated conditions
- intensive livestock farming consumes huge amounts of fresh water

Select locally and seasonally produced food

- food transport accounts for an estimated 12% of all greenhouse gases associated with UK food consumption, buying locally can decrease the demand for heavily transported food
- the production of fertilisers, fuel for machinery, energy for heating and materials, and animal feed all increase greenhouse gas emissions. Local farmers and producers often favour more sustainable farming methods that reduce greenhouse gas emissions, preserve wildlife, conserve water and take account of soil health
- buying locally and in season reduces the need for storage of food. Refrigeration contributes to climate change both because of the energy used to operate the equipment and because of the impact of refrigerant gases
- processed foods are often heavily packaged to aid transport and storage. Packaging is wasteful of natural resources. Locally produced and seasonal foods are often sold loose and fragile produce changes hands fewer times, so damage and waste are minimised

Select fish only from sustainable sources

- support organisations and businesses that sell sustainably caught or farmed fish to avoid contributing to the problems associated with overfishing such as by-catch of endangered, threatened and vulnerable species such as sharks and damaging marine habitats caused by certain types of fishing gear such as bottom trawling

Select organic produce

- organic farming methods focus on developing healthy fertile soil. Artificial chemical fertilisers are prohibited. Pesticides are severely restricted – instead organic farmers develop nutrient-rich soil to grow strong, healthy crops and encourage wildlife to help control pests and disease
- a diversity of crops and animals are raised on the farm and rotated around the farm over several seasons, including fallow periods. This mixed farming approach helps break cycles of pests and disease and builds fertility in the soil
- healthy soil helps to prevent floods and mitigates the effects of drought and consequently the impact of climate change
- organic farms have 20% more organic matter in their soil on average. Organic matter is very important for building natural fertility and nutrients, and helping the soil to store water

All other valid points will be given credit.

[20]

20

- 3 "There are 1.66 million farmers and workers spread across more than 73 countries participating in Fairtrade". Explain how the Fairtrade Foundation work to make things better for these farmers and workers. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the work of the Fairtrade Foundation in relation to producer countries
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how the Fairtrade Foundation work to make things better for these farmers and workers
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the work of the Fairtrade Foundation in relation to producer countries
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how the Fairtrade Foundation work to make things better for these farmers and workers
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the work of the Fairtrade Foundation in relation to producer countries
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how the Fairtrade Foundation work to make things better for these farmers and workers
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the work of the Fairtrade Foundation in relation to producer countries
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how the Fairtrade Foundation work to make things better for these farmers and workers
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- Fairtrade Minimum Price; guarantees producers a minimum price for the product they sell as Fairtrade, even if the market price is lower. When the market price is higher than the Fairtrade Minimum Price, producers will receive the higher market price. This helps farmers to secure stable, fair prices. This enables farmers to invest in the future of their businesses, looking ahead with greater confidence. It supports the farmers that grow products such as cocoa, coffee and bananas to become more income-secure and less vulnerable to poverty

- co-operatives; Fairtrade is gradually empowering communities to organise into co-operatives and improve their negotiating position within the supply chain. This can enable them to negotiate a higher price for their product than the conventional market price
- training; Fairtrade improves access to agricultural services like organic training and premium markets. As a result, farmers have an incentive to farm better and sell more
- Fairtrade Premium; on top of the price farmers and workers receive for their produce or labour, they receive an extra sum of money to invest in improving the quality of their lives. The Fairtrade Premium is calculated as a percentage of the volume of produce sold. The price is reviewed every three to four years to adjust to local inflation. To become Fairtrade certified, farmers must join together with other farmers to form a co-operative. The Fairtrade Premium is paid at the co-operative level so that the farmers' democratically elected representatives can decide how the money is spent. The farmers have the right to choose any activities that are important to their particular situation, aspirations and priorities. Examples include investment in collective assets to improve crops and yields, improve education opportunities, housing, schools and medical facilities
- health; for some farmers, the Fairtrade Standards have resulted in switches to less toxic pesticides, which has a positive impact on producers' health
- control; farmers and workers who choose to participate in Fairtrade often feel a real sense of control over their future with greater power and voice
- know their rights; Fairtrade can support workers to realise their rights and negotiate the terms and conditions of their work through trade unions and collective bargaining
- gender equality; Fairtrade Standards are designed to prevent gender inequality, increase female participation and empower women and girls to access the benefits of Fairtrade. Requirements for producer organisations include no discrimination on the basis of gender or marital status, zero tolerance of behaviour that is sexually intimidating, abusive or exploitative and the provision of programmes to support disadvantaged and minority groups such as women
- quality of life; investment of the Fairtrade Premium by co-operatives in community development projects is improving the quality of lives of rural communities

All other valid points will be given credit.

[20]

20

AVAILABLE
MARKS

- 4 Describe what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the issue of food poverty in the UK
- inadequate knowledge and understanding of what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the issue of food poverty in the UK
- adequate knowledge and understanding of what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the issue of food poverty in the UK
- competent knowledge and understanding of what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the issue of food poverty in the UK
- highly competent knowledge and understanding of what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe what is being done to reduce food poverty in the UK by FareShare and The Trussell Trust
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

**AVAILABLE
MARKS**

FareShare

- redistribute surplus food; FareShare reduce food poverty in the UK by redistributing surplus food from the food industry to charities and community groups such as children’s clubs, homeless hostels and refuges
- campaigns; FareShare run campaigns such as #ActiveAte to combat food poverty in the UK. #ActiveAte helps families who find it difficult to provide meals during the holidays for their children. This programme supplies nutritious meals and snacks for these children across the UK
- feed people first; currently in the UK, instead of surplus food being used to feed people, many food manufacturers, processors and suppliers dispose of that food via anaerobic digestion or provide it for animal feed. There are currently a number of Government incentives to support anaerobic digestion. The same incentives do not exist for feeding people – so FareShare are asking the Government to bring in a level playing field and ensure that it is cheaper for food businesses to redistribute food rather than to throw it away

The Trussell Trust

- food banks; The Trussell Trust support a nationwide network of food banks to provide emergency food and support to people locked in poverty. Care professionals such as health visitors, schools and social workers identify people in crisis and issue them with a food bank voucher. This means people can receive a food bank parcel of three days’ nutritionally balanced, non-perishable food from their local food bank
- provide additional help; their food bank network helps people break free from poverty by providing additional support to help resolve the crises that they face. In recent years, food banks in the Trussell Trust network have been widening their services to prevent people from reaching further crisis and help them break free from poverty for example, running holiday clubs and budgeting courses. Many of the food banks in their network are already providing more than food projects and building local connections to address the causes of poverty within their community
- campaign for long term change; The Trussell Trust collaborate with other charities and organisations to commission research. Their experiences with those who use food banks, provides valuable evidence to support research in areas such as the causes of food bank use. They use their evidence to campaign for change for people on the lowest incomes by sharing this evidence with policymakers and the public to ensure they understand fully the state of hunger and poverty in the UK. Current campaigns that they encourage the public to support and take part in include: ‘Five weeks too long’ which refers to waiting time for Universal Credit. Everyone who applies has to wait at least five weeks for a first payment – some people are left waiting longer. This is leaving many without enough money to cover the basics such as food
- social enterprise; The Trussell Trust run a range of social enterprise projects such as community shops. Profits are reinvested into the projects themselves or into working towards their mission of ending hunger and poverty in the UK

All other valid points will be given credit.

[20]

20

5 Describe how WRAP UK aims to reduce food waste. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of how WRAP UK aims to reduce food waste
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe how WRAP UK aims to reduce food waste
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of how WRAP UK aims to reduce food waste
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe how WRAP UK aims to reduce food waste
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of how WRAP UK aims to reduce food waste
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe how WRAP UK aims to reduce food waste
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of how WRAP UK aims to reduce food waste
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe how WRAP UK aims to reduce food waste
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

- campaigns; WRAP UK encourages consumers and businesses to waste less food through their campaigns. Love Food Hate Waste aims to raise awareness of the need to waste less food among consumers and provides practical advice to achieve this. 'Your Business is Food' is a campaign developed by WRAP under the Courtauld Commitment 2025 to help businesses throw away less food. 'Your Workplace without Waste' is an employee engagement programme which will help everyone across a business to throw away less food and packaging
- schools, community organisations and local authorities; WRAP UK offer guidance to these groups to cut costs by reducing food waste and encouraging local involvement in food waste reduction initiatives

- voluntary agreements; WRAP brokers and manages sector-wide voluntary agreements, accelerating change in ways that governments, individual companies or community groups cannot achieve on their own. They forge powerful partnerships, bringing together organisations that would not normally work together, to work towards common goals, for example, The Courtauld Commitment 2025 is an ambitious voluntary agreement that brings together a broad range of organisations to make food and drink production and consumption more sustainable
- redistribution of surplus food; WRAP is working with retailers, Hospitality & Food Service and manufacturers, logistics and redistribution organisations, together with industry bodies, to identify ways of increasing the redistribution of surplus food. Preventing food waste at source should always come first, but surpluses can arise for a number of reasons; for example, food incorrectly labelled, over-ordered, over-supplied or obsolete seasonal stock. WRAP's report 'Quantification of food surplus, waste and related materials in the grocery supply chain' concluded that where food waste cannot be prevented, there is potential to redistribute the equivalent to around 400 million meals a year
- reducing water usage; WRAP is working with WWF and other experts to develop a new water ambition for Courtauld 2025. This includes a programme of collective action projects to improve water stewardship
- research; WRAP carry out research to support their work. It is shared with businesses, governments and charities for example: 'Reducing Food Waste by Extending Product Life' was a study carried out to demonstrate the business case for preventing food waste by reviewing and extending product life. Drawing on the report's findings, Tesco saw an opportunity to source fresh produce more quickly, helping them to offer their customers products that stay fresh for longer
- Hospitality and Food Service; the Hospitality industry contributes to food waste figures. WRAP UK manages the Courtauld Commitment 2025 Hospitality and Food Service sector. The WRAP UK website provides a range of resources to support this sector for example guidance on how to measure and monitor food waste, good practice advice on purchasing ingredients, food storage, preparing food and portioning and plate waste
- food retailers; WRAP provide tools, research and guidance to support retailers to minimise waste in their supply chain, encourage consumers to reduce their food waste and support third-sector organisations by developing ways of redistributing food to those in need
- primary production; WRAP UK is working with farmers, retailers and growers to address food waste on farms. They started by measuring the scale of the problem with two key crops: strawberries and lettuce. A number of projects are in place to address common issues that arise in production and pilot interventions to overcome these difficulties. The work will move towards developing guidance and best-practice case studies to help others take action and expand the working practices more widely

All other valid points will be given credit.

[20]

**AVAILABLE
MARKS**

Section B

60

Section A

25

Total

85

Section A

- 1 (a) Describe the main sources of salmonella in the food chain. (AO1, AO2, AO3)

Mark Band ([0]–[2])

Overall impression: basic

- inadequate knowledge and understanding of sources of salmonella in the food chain
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe the main sources of salmonella in the food chain
- quality of written communication is basic

Mark Band ([3]–[5])

Overall impression: adequate

- adequate knowledge and understanding of sources of salmonella in the food chain
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe the main sources of salmonella in the food chain
- quality of written communication is adequate

Mark Band ([6]–[8])

Overall impression: competent

- competent knowledge and understanding of sources of salmonella in the food chain
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe the main sources of salmonella in the food chain
- quality of written communication is competent

Mark Band ([9]–[10])

Overall impression: highly competent

- highly competent knowledge and understanding of sources of salmonella in the food chain
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe the main sources of salmonella in the food chain
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

- eggs and milk; consuming raw or undercooked eggs (not Lion Eggs), unpasteurised milk or other dairy products contaminated with salmonella can pass on infection
- meat; contaminated meat that is undercooked can be a source of salmonella. Poultry such as chicken and turkey, and pork are likely to carry salmonella

- fruit and vegetables; these can become contaminated with salmonella through contact with manure
- shellfish; may become contaminated if they are in contact with sewage in their water
- cross-contamination; humans – once a person has salmonella the infection may be spread if strict hygiene measures are not followed. Equipment – utensils and surfaces can be contaminated if they have been in contact with infected food
- contaminated water; drinking water that has not been treated to remove bacteria can be a source of salmonella

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

- (b) Explain how a Hazard Analysis Critical Control Point (HACCP) system in a food business could prevent contamination from salmonella. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of how HACCP prevents contamination
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how HACCP prevents contamination from salmonella
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of how HACCP prevents contamination
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how HACCP prevents contamination from salmonella
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of how HACCP prevents contamination
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how HACCP prevents contamination from salmonella
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of how HACCP prevents contamination
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how HACCP prevents contamination from salmonella

- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- hazard analysis; identifying anything which may cause harm to customers. Hazards include food poisoning bacteria such as salmonella because they can survive inadequate cooking, multiply to harmful levels in food given the right conditions and spread from raw to ready to eat foods
- critical control points (CCPs); the stages where the hazards must be controlled for the food to be safe to eat. This could involve: purchasing from a reputable supplier; hygienic delivery and storage with correct temperature; cooking chicken to a core temperature of at least 70°C for 2 minutes to destroy salmonella
- critical limit; specified safety limits at CCPs, which separates safe food from unsafe food. Critical limits are usually numerical values, e.g. critical limit for the storage of foods in a fridge: 0–5°C is good practice, up to 8°C not critical, at 10°C the critical limit is exceeded and is potentially unsafe
- monitoring; procedures need to be established to ensure hazards are controlled at CCPs. This may involve temperature checks of fridge, visual inspection and time recording
- corrective action; should be taken when monitoring (at CCPs) has identified that the critical limit has been exceeded. Action must either make the food safe or prevent its entry into the food chain. For example: the fridge temperature is 10°C. Corrective action may state to; relocate the food to another fridge or call the fridge engineer. Thus salmonella does not have opportunity to multiply
- verification; an overview of HACCP system to ensure it is working effectively. May include manager’s weekly checks and food sampling
- documentation; necessary to have appropriate documentation to demonstrate HACCP is working effectively. These will usually incorporate written procedures, training records, sampling records, etc.

All other valid points will be given credit.

[15]

Section A

**AVAILABLE
MARKS**

25

25

Section B

**AVAILABLE
MARKS**

- 2 Explain how quality assurance standards are used by food manufacturers to ensure safe food production. Provide examples to support your answer. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of food quality assurance standards
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how these standards are used by food manufacturers to ensure safe food production
- demonstrates a limited ability to provide examples
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of food quality assurance standards
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how these standards are used by food manufacturers to ensure safe food production
- demonstrates an adequate ability to provide examples
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of food quality assurance standards
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how these standards are used by food manufacturers to ensure safe food production
- demonstrates a competent ability to provide examples
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of food quality assurance standards
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how these standards are used by food manufacturers to ensure safe food production
- demonstrates a highly competent ability to provide examples
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- rationale; food assurance standards help to provide consumers with guarantees that food has been produced to a high specification. These are mainly voluntary arrangements, although many manufacturers make

- certification in an assurance scheme a necessary requirement
- standards; members must comply with stringent standards of food safety drawn up by a panel of independent food safety experts. The panel meets on a regular basis to update the standards in accordance with changes in legislation and improvements in best practice. The Food Standards Agency make best practice recommendations. The main areas covered by the standards include: food safety and hygiene; traceability and safe use of veterinary medicines and chemicals at farm level
- audit; farms and factories are inspected by independent auditors to ensure that the food is being produced in accordance with the stipulated standards. The audit is conducted at regular intervals to ensure compliance, with random audits where necessary
- certification; this is granted provided the farm or factory meets the requirements of the standard accredited by the United Kingdom Accreditation Service (UKAS). Certification is official confirmation that the audit has been passed and the member is then eligible to use logos on products

Examples of schemes:

- Lion Eggs; the only UK egg-specific assurance scheme that meets the standards of international accreditation standard. Covers the entire production chain, ensures eggs have been produced to the highest standards and incorporates food safety controls beyond EU legislation. This includes compulsory vaccination against salmonella; a 'passport' system ensuring all hens, eggs and feed are fully traceable; salmonella testing and farm/packing station hygiene controls. The scheme has been responsible for a drastic reduction of salmonella in UK eggs, the Food Standards Agency state they are the only eggs safe to be consumed runny, or even raw, by vulnerable groups
- Red Tractor; UK whole chain food assurance scheme which guarantees high standards of food safety protection and traceability from farm to pack. Red Tractor producers are overseen by Assured Food Standards (AFS). Everyone involved from farmer to caterer are experts in their field, trained to handle food safely. The Red Tractor logo can be found on meat, fruit, vegetables, flour, sugar and dairy products. AFS guarantees that products have been born, raised, slaughtered, grown, prepared and packaged entirely within the UK
- NIBL FQAS; Northern Ireland Beef & Lamb Farm Quality Assurance Scheme is part of the Red Tractor Scheme, gives consumers assurances about the farm end of the production chain. It is about farm standards, but the main priority is producing beef and lamb which is safe and free from unnatural substances. In addition to farm assurance, animal feed suppliers, livestock markets and hauliers, abattoirs and packing plants must all be assured to the appropriate standard

All other valid points will be given credit.

[20]

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- 3 Explain how food allergen labelling and information regulations ensure food safety for individuals with an allergy. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of food allergen labelling and information regulations
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how food allergen labelling and information regulations ensure food safety for individuals with an allergy
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of food allergen labelling and information regulations
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how food allergen labelling and information regulations ensure food safety for individuals with an allergy
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of food allergen labelling and information regulations
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how food allergen labelling and information regulations ensure food safety for individuals with an allergy
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of food allergen labelling and information regulations
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how food allergen labelling and information regulations ensure food safety for individuals with an allergy
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- legislation; Food Information Regulations 2014 enables local authorities to enforce European Food Information to Consumers Regulation. Food businesses must provide information about the allergenic ingredients used, if not penalties are issued. Individuals will be protected due to the enforcement of this legislation
- allergen labelling; 14 allergens are recognised as the most common ingredients or processing aids causing food allergies. Allergenic ingredients must be declared with a clear reference to the allergen to ensure uniform

- understanding and avoid ambiguities
- format: information about allergenic ingredients could be located in a single place, i.e. the ingredients list on pre-packed food. Allergenic ingredients must be emphasised through a typeset that clearly distinguishes it from other ingredients by font, style or background colour. This allows for easy identification of allergens
 - allergen advice; additional statements can also be used on labels to explain how allergen information is presented on a label, for example: 'Allergen Advice: for allergens see ingredients in bold'. For alcoholic drinks with no ingredients list, the word 'contains' followed by the name of the allergen can be used
 - distance selling; mandatory information must be available before the purchase is completed and at the moment of delivery to avoid any incidents. The allergen information should be available to a customer in a written form at some point between a customer placing the order and taking delivery of it
 - non pre-packed food; regulations require for allergy information to be provided for unpackaged foods. Examples include; sandwich bars, cafés, restaurants and schools. This information can be delivered orally, must be accurate, consistent and verifiable
 - precautionary allergen labelling; if there is a risk of a food product being affected by allergen cross-contamination, the label should include one of the following statements: may contain X or not suitable for someone with X allergy. Should only be used if the risk is real and cannot be removed. This will prevent individuals unnecessarily avoiding foods. The use of statements such as 'contains milk' to replace allergen ingredient information is not permitted
 - free-from labels; special ranges of foods made without allergens. If a label states that product is 'free-from milk' it has to be based on rigorous controls and guarantee that the final product is completely free of the allergen, this includes packing materials. Cross-contamination from other foods made on site should be prevented. This makes selection of food easier for those with severe allergies
 - pre-packed for direct sale; any business that produces PPDS food is required to label it with the name of the food and a full ingredients list, with allergenic ingredients emphasised within the list

All other valid points will be given credit.

[20]

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AVAILABLE
MARKS

- 4 Discuss the work of the Food Standards Agency (FSA) in relation to food safety. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

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

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the work of the FSA in relation to food safety
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the work of the FSA in relation to food safety
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the work of the FSA in relation to food safety
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss the work of the FSA in relation to food safety
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

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

Examples of suitable points to be discussed by the candidate:

- strategy; FSA research a wide range of factors likely to have an impact on the safety of food. Their pledge is to put consumers first, so that food is safe and what it says it is. They introduce a strategic plan every five years focusing on current issues aiming to reduce contamination of food
- news and alerts; food alerts are issued if there are issues with pathogenic bacteria or foreign objects, product may be recalled. Allergy alerts when allergy labelling is incorrect or there is a food allergy risk. Consumers can sign up to receive messages when FSA issue an allergy alert. News published regularly, e.g. new law requiring more foods to be labelled with allergen information from 2021

- allergy and intolerance; the FSA commissions research to increase knowledge and understanding of food allergy and intolerance. They strengthen food labelling rules and produce best practice guidance to advise industry and enforcement. Help to raise awareness of food allergy and intolerance, provide online interactive food allergy training. The FSA investigate incidents to ensure food safety is protected and food is correctly labelled
- food businesses; the FSA provides guidance and advice for all sections of the food chain on how to manage food hygiene and safety at every stage of the process. This includes toolkits for promoting good hygiene and 'Safer Food, Better Business' packs. They encourage food safety management procedures based on HACCP principles
- food hygiene rating scheme: the FSA in partnership with local authorities oversees the scheme helping to reduce the incidence of food-borne illness by giving consumers information about hygiene standards. The scheme encourages businesses to improve standards of food safety
- training; FSA provide training materials and online courses for all those involved in the food chain on a range of subjects including: labelling, food safety, hygiene, feed safety and traceability
- National Food Crime Unit (NFCU); established following the horse meat incident. It is a law enforcement unit providing national leadership on food crime. The NFCU works to protect consumers from serious criminal conduct that impacts on the safety of food, e.g. unlawfully placing food meant for disposal back into the supply chain
- food poisoning; oversee biological safety, chemical safety and biotechnology. The FSA monitor trends and support authorities in the investigation of food-borne illness, becoming directly involved if there is a serious incident
- meat plants; the FSA is directly responsible for food safety controls in abattoirs and cutting plants following high profile incidents of poor food hygiene. Regular audits are undertaken to ensure there are hygienic practices and effective food safety systems

All other valid points will be given credit.

[20]

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AVAILABLE
MARKS

- 5 Explain the potential food safety risks of pesticide residues and describe how these risks can be reduced. (AO1, AO2, AO3)

Mark Band ([0]–[5])

Overall impression: basic

- inadequate knowledge and understanding of the potential food safety risks of pesticide residues
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the potential food safety risks of pesticide residues and describe how these risks can be reduced
- quality of written communication is basic

Mark Band ([6]–[10])

Overall impression: adequate

- adequate knowledge and understanding of the potential food safety risks of pesticide residues
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain the potential food safety risks of pesticide residues and describe how these risks can be reduced
- quality of written communication is adequate

Mark Band ([11]–[15])

Overall impression: competent

- competent knowledge and understanding of the potential food safety risks of pesticide residues
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain the potential food safety risks of pesticide residues and describe how these risks can be reduced
- quality of written communication is competent

Mark Band ([16]–[20])

Overall impression: highly competent

- highly competent knowledge and understanding of the potential food safety risks of pesticide residues
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain the potential food safety risks of pesticide residues and describe how these risks can be reduced
- quality of written communication is highly competent

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

Potential Risk

- pesticides; contain at least one active substance which can be chemicals or micro-organisms, including viruses. Pesticides pose a food safety risk as they are potentially toxic to humans
- health risk; may cause cancer, birth defects and damage to nervous system. Pesticides can interfere with hormones, this 'endocrine effect' can be activated by very low concentrations of residues. Cumulative effect – residues collect in bodies over time causing long-term health problems.

Adults may not get ill from pesticides until many years later, for children it takes less time

- cocktail effect; the effects of individual pesticides can be enhanced or altered when combined. Uncertainty of impact this exposure is having, current systems only assess the safety of individual pesticides
- vulnerable groups; children are especially vulnerable as they take in more food relative to their body weight compared to adults. Some diseases associated with ageing have been linked to pesticides. Vegetarians may have a higher exposure due to their plant-based diet

Reducing Risk

- legislation; the marketing and use of pesticides and their residues to ensure food safety is regulated. Pesticides – Regulation 1107/2009 and residues – Regulation 396/2005. The pesticide must be authorised and data indicate that they pose no risk to food safety
- authorisation; risks are minimised by robust evaluations of new pesticides, without this approval it is illegal to market, store or use the pesticide in the UK. Substantial scientific data must be provided to demonstrate that the product poses no food safety risk. The FSA oversee pesticides and food safety
- review; the safety of all approved pesticides is reviewed regularly to ensure they meet the most up-to-date safety standards. Active substances are generally approved for a period of 10 years; after which they should be reviewed
- maximum residue levels; (MRLs) are the upper levels of pesticide residues that are legally permissible, taking into consideration vulnerable consumers. A wide safety margin is included that is well below the level that could cause adverse effects on food safety
- compliance; farmers, traders and importers must comply with MRLs. Each EU member is responsible for the control and enforcement in their country. If pesticide residues are found in food at a level of concern, they are not allowed on the market. Residues in the UK are monitored through surveillance conducted by the Chemical Regulation Directorate

All other valid points will be given credit.

[20]

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Section B

60

Section A

25

Total

85

AVAILABLE MARKS